

Norstar Handbook Release 7.1

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The Norstar Handbook is published by Nortel Networks—Small Business Solutions Marketing group. This handbook is intended as a reference guide for Sales Representatives, Telemarketers, and others who support the Norstar product portfolio.

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In Canada – order through your Nortel Networks Service Representative using standard ordering procedures for Norstar products and collateral.

Order Codes

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Release History

Issue 7.1 (February 2001) of the Norstar Handbook includes updates on:

Business Series Terminals

Norstar Modular ICS Release 4.1.1

- Message Waiting Indicator (MWI) availability on Business Series Terminals.

Norstar Compact ICS Release 4.1.1

- Message Waiting Indicator (MWI) availability on Business Series Terminals.

PRELUDE and CINPHONY ACD 3.4

- Agent logon capabilities with Companion C3050 and C3060 portables.

Retired from the Norstar product line

- CTA 150i - Effective December 10, 1999;
- CTA 500dm - Effective January 31, 2000;
- M7410 telephone - Effective February 7, 2000;
- Integrated Data Module 200 (IDM 200) - Effective April 1, 2000;
- Modular 8x24 Expansion Cartridge - Effective April 1, 2000;
- Copper Expansion Cartridge - Effective April 1, 2000;
- Copper Station Module - Effective April 1, 2000;
- Copper Trunk Module - Effective April 1, 2000;
- 1A2 Trunk Cartridge - Effective April 1, 2000.

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Introduction

The *Norstar Handbook* is a reference tool designed for representatives who sell the Nortel Networks Norstar product portfolio in North America. The *Norstar Handbook* is packed with information about all current Norstar products and is updated by supplements when new products are introduced.

The content of the *Norstar Handbook* is organized so you can quickly find the most relevant section for a current project or request for information. The information you find here should help to make your Norstar sales easier, quicker and more professional.

The *Norstar Handbook* is intended for reference purposes only. Please consult the latest Norstar Product Catalog or ordering source for detailed specifications and ordering information.

The hardware mentioned in this handbook may not be a standard offering with your company. Before talking to a customer about information in this book, please check for availability, pricing, current distribution and support policies.

Nortel Networks™

How the world shares ideas.

After more than 100 years of experience in providing global telecommunications solutions, Nortel (Northern Telecom) acquired Bay Networks, Inc., adding world-class, IP-based data communications capabilities that complement and expand Nortel's acknowledged strengths. This precedent-setting union creates Nortel Networks™, a unique entity that is first to offer customers a new class of customer partnership.

This combined experience creates a true synergy, one that will accelerate the integration of the world's disparate data and telephony networks into Unified Networks™, optimized for both service providers and enterprise customers.

Nortel Networks designs and delivers unified networks to capitalize on the full potential of the Internet and to harness its power for businesses. Combining voice, video and data in unique and innovative solutions, Nortel Networks is ready to help businesses of all sizes optimize applications across diverse networks – simplifying network operations, maximizing cost reduction and offering businesses critical competitive advantages that speed success.

With a combined revenue of US \$21.3 billion for 1999, Nortel Networks establishes a global, multicultural company with operations in more than 150 countries and territories, and unites 70,000 employees worldwide.

Norstar Overview

Nortel Networks delivers global, industry-leading enterprise solutions for businesses of all types and sizes. These include communications systems, call center and multimedia messaging applications, and interactive voice and data access products. The company's customer-driven solutions increasingly take advantage of Internet and computer integration, helping drive business performance, and creating a greater competitive advantage for our customers. One such Nortel Networks enterprise communications solution is Norstar Integrated Communications Systems.

Norstar Integrated Communications Systems provide complete, integrated communications solutions to power businesses worldwide. Digital switching, applications, mobility, and more – all working together – so building and using a Norstar communications system is simple.

The Norstar target market is made up of single-site stand-alone businesses, multi-site businesses and franchises, as well as branch offices and departments within large organizations. In North America alone, this market accounts for 98% of all business locations and more than one-third of all business communications dollars.

Market studies indicate that:

- The decision to buy a telephone system is made every 5 to 7 years,
- Decisions are made quickly, based on the experience of the business with telephone systems and the reputation of the supplier,
- The needs of users vary greatly, as does their understanding of how a telephone system can improve their business.

Since its introduction in 1988, Norstar has cost-effectively brought digital technology to the desktops of small businesses, ensured simplicity for the end user, and provided an architecture that allows new functionality and applications to be integrated into the system.

With more than 12 million telephone sets in over 80 countries, Norstar has today become *the #1 small system for business communications in the world*.

Norstar ICS

The Norstar Integrated Communications Systems (ICS) portfolio, introduced in 1994, is based on a vision that links computers and communications platforms, networks and components to deliver innovative solutions to today's business challenges and tomorrow's opportunities. With Norstar ICS, a small system can offer companies the kind of power previously found only in big-business environments. Thanks to its building-block design, Norstar systems easily expand for even greater power as the company grows. This approach makes the most of voice, data, and video technologies – both now and in the future.

Combining the latest technological advances with LCD windows on every Norstar telephone, ICS systems provide powerful yet friendly and intuitive business communications including functionality such as ISDN, Internet Access, and Desktop Messaging.

There are three Norstar platforms to choose from: Modular ICS, Compact ICS, or 3x8, all of which can integrate business communications to make employees more productive, reduce costs, and provide superior customer service. The size of a business and their business communications requirements determine the Norstar system that's right for them.

Norstar Modular ICS

The Norstar Modular ICS targets businesses that use more than 20 telephones and require capabilities that allow for more power, more growth and more advanced applications. It can start as small as 4x32 (4 lines and 32 extensions). The Modular ICS can support analog or digital lines, including ISDN BRI and PRI for high-speed voice and data applications. With XC software installed, Modular ICS capacity increases to 272 ports and supports integrated Companion wireless for full roaming capability.

Norstar Compact ICS

The Norstar Compact ICS starts at 4x8 (4 lines and 8 extensions) or 4x16 and can grow to 16x24 with ISDN Basic Rate Interface. The Compact ICS is built to meet the existing telephony requirements of small businesses, and equip them for the additional step up into new technology. The resulting product is an exciting and simple solution that accommodates future growth, both in number of lines and the technology available to users.

Norstar 3x8

The simple, yet sophisticated, Norstar 3x8 system was designed specifically for small businesses. It is expandable up to 3 lines and 8 extensions, and offers a wide variety of features to manage communications and improve customer service.

Norstar Applications

Norstar Applications are designed to integrate with Norstar business communications systems to provide messaging, call management, faxing, e-mail, and much more. All Norstar Applications integrate seamlessly with Norstar systems, so they are easy to add as customers need them.

Messaging

Norstar Voice Mail

Norstar Voice Mail answers incoming calls and can take messages for everyone in the company – with complete accuracy – 24 hours a day, 7 days a week. It improves efficiency by cutting down on “telephone tag” and freeing employees to concentrate on the work at hand, confident that they will not miss a phone call.

Norstar Dial-by-Name

Norstar Dial-by-Name, which is included with Norstar Voice Mail, is a time-saving business tool that turns the LCD window on a Norstar telephone into an electronic Rolodex with

names, important details about those names, automatic dialer, and access to multiple phone books. With a simple touch of a key, a user can quickly find and dial the number they are looking for.

Norstar Fax Messaging

Fully integrated with Norstar Voice Mail, Fax Messaging provides a new level of fax management that increases productivity by allowing a user to retrieve their fax and voice messages with one call, send faxes to group distribution lists, receive confidential faxes whenever they choose, store faxes in a private mailbox for later processing, and end the wait at the fax machine for their transmissions.

Norstar Desktop Messaging

Norstar Desktop Messaging is the solution to information overload. It lets users retrieve all incoming information – voice, fax and e-mail messages – directly from their computer screen. At a glance, a user can see who the messages are from, when they arrived and how urgent they are. They can read or listen to the messages in any order, forward or save them – all at the click of a mouse button. Even when voice, fax and e-mail messages are coming in faster than the user can retrieve them, they can manage and prioritize what's important, saving the rest for later.

Norstar Digital Networking

Norstar Digital Networking is the solution for almost any organization that wants fast, clear and seamless voice and fax communications to everyone across its Local Area Network (LAN) or Wide Area Network (WAN), or via the Internet. Voice messages can be transferred over a LAN/WAN, or the Internet, to other Norstar Voice Mail or Meridian Mail (with Network Gateway) systems using standard Internet protocols. Digital Networking also transfers voice and fax messages seamlessly between Norstar systems. And with digital technology, these messages are unaffected by bandwidth or circuit quality, arriving at their destination crystal clear.

Norstar Flash Voice Mail

This powerful Norstar voice messaging solution delivers superior performance for a lot less money to businesses with lower call volumes. Norstar Flash Voice Mail is a revolutionary solid-state solution for intelligent voice processing. It's specially designed to work with Norstar systems to provide Auto Attendant, Calling Line ID integration and more.

Norstar Call Pilot

Norstar Call Pilot is a new messaging platform for Norstar that replaces the Norstar Flash Voice Mail Light and the Flash 2-and 4-port products.

- Norstar Call Pilot 100 is designed to provide voice messaging for the price-sensitive customer who requires limited scalability in the number of mailboxes and storage, but who may require a basic call center application, such as the Clarify Basic Call Center.

- Call Pilot 150 is designed to address the customer who requires additional mailbox and storage expansion, as well as more sophisticated applications, such as Call Pilot Unified Messaging, Call Pilot Digital Networking and Call Pilot Fax Suite, together with a comprehensive call center application such as the Clarify Professional Call Center.

Norstar Call Centers

Norstar Automated Call Distribution (ACD) systems make the idea of “Call Center” capabilities realistic and cost-effective for most any size business. Whether a business needs a powerful ACD system for many agents, or a smaller system for auto answering and call routing, Norstar ACD systems offer high value and are easily cost justified.

Norstar MINUET ACD

Norstar MINUET ACD is an entry-level ACD, included with Norstar Voice Mail, that offers faster and easier call handling for more efficient call routing, improved customer service and employee moral, increased revenue, reduced line and toll charges. MINUET ACD supports up to 10 active agents and 15 incoming lines.

Norstar PRELUDE ACD

Norstar PRELUDE ACD is designed for businesses with as many as 15 active phone representatives and up to 30 incoming lines. To help improve how a business handles inbound calls, PRELUDE ACD offers essential features like: real-time group and system status displays, management reports, “longest-idle” call distribution, voice announcements played to callers on hold, call overflow, caller directed routing, and other advanced call routing.

Norstar CINPHONY ACD

Norstar CINPHONY ACD offers additional capacity and supervisor functions to meet the needs of growing businesses. CINPHONY ACD is available in two capacity levels: Level I supports up to 30 representatives and 80 phone lines; Level II supports up to 80 representatives and 120 phone lines. In addition to all the features of PRELUDE ACD, CINPHONY ACD provides: intelligent call routing, call categorization capabilities, priority queuing for callers, caller directed routing, export of ACD information to other software tools for specialized reporting, supervisor tools such as information displays on the Norstar telephone, HELP requests from employees, and silent monitoring.

Norstar Flash ACD

This newest addition to the Norstar call center family is designed to run either alone or along with voice mail on the Flash platform. It’s an entry-level ACD system for very small formal or informal call centers. It can support up to 10 active agents and 15 phone lines.

Norstar Desktop CTI

CTI...TAPI...Enablers...Windows...LANs...A world of complex new words for a simple idea. Norstar introduced Computer Telephony Integration (CTI) with its first system in 1988.

CTI connects the intelligence of the personal computer (PC) with the power and flexibility of the Norstar ICS. Using the Microsoft Telephony Applications Programming Interface (TAPI), businesses can use a variety of CTI applications that combine telephone and computer

functionality in exciting new ways to increase employee productivity and customer satisfaction.

The Norstar Computer Telephony Adapter (CTA) family of products bridge the language gap between telephone systems and computers, so businesses can take advantage of the latest CTI applications.

Norstar CTA 100

The CTA 100 connects a PC and a Norstar telephone to the Norstar ICS over a single pair of wires. Call information is delivered from the Norstar system to the CTA 100, which sends the information to both the telephone and PC. The CTA 100 enables CTI applications like contact managers and screen pops, and even passes Caller ID through to the PC.

Norstar CTA 160i

The Norstar CTA 160i is a card that fits in an expansion slot inside a PC – especially useful if the user is running out of space on their desktop. It provides the same services as the CTA 100.

Norstar CTA 200

The Norstar CTA 200 is an external device for the advanced CTI user that connects a PC to the Norstar system. The CTA 200 delivers both RS-232 and Universal Serial Bus (USB) connectivity with flash memory for a new level of functionality. As with all of Norstar's desktop CTI peripherals, the CTA 200 is bundled with the Personal Productivity Suite.

Norstar Personal Call Manager

Personal Call Manager, a Windows 95, Windows 98, and Windows NT TAPI application, provides access to the features of a Norstar system from a Windows 95 PC. The user can answer calls, dial, build conference calls, and even see call activity – all on their PC screen. When integrated with Calling Line ID, Personal Call Manager can “pop” a dialog box to a PC showing who is calling and associated information that may be stored in a database on the PC. This award-winning CTI application is packaged with all of the Norstar CTA products.

Norstar PC Console

Designed to run on industry-standard Windows 95/98/NT PCs, Norstar PC Console allows telephone attendants to monitor phone calls from their computer screen and answer and route them just by pointing and clicking. Norstar PC Console includes powerful call management tools such as a self-learning database, a versatile directory and visual call announce.

Norstar Mobility

Studies show that people spend approximately 2.5 hours a day away from their desks – and their phones. Think about the revenue impact the resulting inability to communicate could have on a business.

Nortel Networks Companion Wireless is fully integrated with Norstar Modular ICS, providing advanced, high-quality, wireless communications for businesses. Users can access the same system features on their Companion portable telephone as they can on their Norstar desk sets.

Norstar Telephones

To end-users, the telephones are the lifeline of their business – a direct line to customers, suppliers, and other key business contacts. Because phones are in constant use, reliability is not an option: it's a necessity. With one of the highest reliability ratings in the industry, Norstar is known for dependable communications, so important phone calls don't get missed.

There are four Norstar telephones. All provide superior functionality and dependability, plus an LCD window that makes them extremely easy to use.

- M7100 is a single-line telephone that delivers dependable functionality to users or areas with low usage requirements, like lobbies and break rooms.
- M7208 is ideal for users who need access to just a few lines, programmable features and autodial numbers and is well-suited for areas with shared telephone, like retail departments, manufacturing plants, or repair centers.
- M7310 is a fully-featured telephone designed for users with more extensive calling and call handling requirements. It has 10 programmable line or feature buttons, plus 12 dual-function memory buttons. Along with the LCD window, this phone has softkeys, which allow the user to interact with the instructional prompts in the window.

Business Series Terminals

The new SBS Business Series Terminals are flexibly positioned for deployment on two system platforms, Norstar and Business Communications Manager, providing both investment protection and a migration path between either system. The Business Series Terminals offer full integration with Norstar features, as well as integration with basic and advanced applications such as Voice Mail, Call Center (ACD), Computer Telephony Integration (CTI), and Integrated Voice and Data Solutions.

While the Business Series Terminals boast the industry leadership and strengths of the Norstar telephone portfolio, the new portfolio also delivers new value-added features like tilt display, visual ring indicator, message waiting indication (MWI)*, new aesthetics, a streamlined footprint, new labeling strategy, an audio control center with a headset button, and more.

- T7100—The T7100 is ideal for low-traffic environments or users with minimal-set usage requirements.
- T7208—The T7208 is suited for lower internal and higher external calling volumes. This set is cost-effective for users who need only a few programmable buttons.
- T7316—The T7316 is a highly featured set with capabilities that position this model in the portfolio for a variety of user groups, including managers and executive professionals.
- M7324+Central Answering Position CAP/KLM—The M7324 set is the choice for busy call answering positions, with its comprehensive coverage for numerous lines on Norstar systems. Up to two Central Answering position modules can be added for extra line coverage.

*Correct Norstar software is required.

Norstar and ISDN

Norstar ICS offers a number of ways to connect to network service providers, including Integrated Services Digital Network (ISDN) Basic Rate Interface (BRI) and Primary Rate Interface (PRI).

ISDN technology provides a fast, accurate and reliable means of sending and receiving data, images, text and voice information through a single pair of copper wires. The Norstar ICS platform brings ISDN functionality to the small site business.

Norstar Compact ICS offers ISDN BRI connectivity, while Modular ICS offers BRI and PRI connectivity.

10 Reasons to Buy Norstar

Our original research for Norstar told us that businesses wanted a telephone system that was flexible, reliable and above all, easy to use. Norstar offers unified, scalable, high-capacity integrated voice and data solutions that can give your business Internet access, high-speed data, wireless capabilities, and a steady stream of revenue-generating applications. But whether you want basic telephony or fully integrated voice and data, Norstar offers business solutions that keep your customers coming back for more.

- 1** **Rock-Solid Reliability.** Norstar has one of the highest reliability ratings in the industry, with a Mean Time Between Failure* rate of more than 50 years. You won't find a more durable, dependable communications system on the planet.
- 2** **Ease of use.** The LCD Window on Norstar telephone sets prompts you through each feature and application. This signature feature minimizes training and makes Norstar one of the easiest communications systems to use. You can take control of your workflow, deciding whether to take a call, return it later, or forward it to a colleague—all with a few simple keystrokes.
- 3** **Getting your money's worth.** An investment in Norstar stays with you, even as your business grows. When upgrading from the Norstar Compact ICS to the Modular ICS, much of the system hardware and all Norstar telephones stay the same, so about 80 percent of your investment is protected. Plus, you'll see your communications costs drop when you automate tasks like call routing, fax-on-demand, and system reports. Efficient call handling also saves you time and money by reducing the average call time, hold time, incoming 1-800 costs, outgoing long distance costs, and networking costs. Protect your investment—and get your money's worth—with Norstar.
- 4** **Amazing Scalability.** The Norstar scalable, modular design lets you choose the system that fits your needs today, and add capacity as you grow. Increasing your system size is as easy as adding expansion cartridges or station and trunk modules. Sometimes it's only a simple software change. Your Norstar communications system can be easily adjusted to handle the demands of your business.
- 5** **Applications and mobility—for all your business needs.** The sheer breadth of the Norstar suite of business applications is astounding. From the convenience and productivity of voice mail, to call centers that can revolutionize your company's call handling capabilities, Norstar offers it all. Norstar can even integrate your computer and telephone to give you screen pops and screen-based telephony. And with Companion Wireless— you can maximize productivity and efficiency by keeping employees in touch with your customers even while away from their desks.

- 6 Fully Integrated Voice and Data.** Your company can do business faster, smarter, and more cost-effectively over the Norstar high-speed network. With Norstar and BayStack, you have the integrated voice and data capabilities you need to stay competitive, including Internet/Intranet access, voice and fax messaging, LAN/WAN networking, call center/automatic call distribution, and integration of your computer and telephone. With Nortel Networks' Norstar, you get big business communications solutions from one consolidated system.
- 7 You Call the Shots.** At Nortel Networks, we address your current network needs—no matter what size or level of technology—and then grow your system as your business needs grow. Norstar can give you feature-rich applications, intuitive telsets, Internet access, high-speed data, wireless solutions, and a host of other cost-saving and revenue-generating capabilities. But it's your choice. You decide where and how you want to interact with your customers. Whether you want basic telephony, an integrated voice and data network, or something in between, Norstar offers just what you need to do business your way.
- 8 Internet Access.** Thanks to Instant Internet from BayStack, your Norstar system gives your company access to the Internet—and to customers who want to contact you and do business on-line. Norstar Data Interface lets you consolidate voice, data, and Internet WAN services and connect data terminal equipment to your Norstar Modular ICS. With Norstar, access to bigger revenues has never been easier.
- 9 Norstar gives you a competitive edge.** Want to differentiate yourself in the marketplace and edge out the competition? Then choose Norstar. Our business-building communication solutions can help you achieve greater productivity, reduced capital and operating costs, increased revenues, and unsurpassed customer service.
- 10 Norstar is #1.** We are the #1 small and growing business communications system in the world. In fact, Norstar telsets are on the desks of more than 12 million people in more than 80 countries around the globe. That's because Norstar is a complete, fully integrated system. And because it offers sophisticated features and applications that are easy to use. Plus, it gives businesses the flexibility to handle future growth and new services. All this from one system? Actually, it's not surprising. The company that stands behind the advanced technology of Norstar is Nortel Networks. Founded in 1895, Nortel Networks is now one of the world's leading providers of business communications equipment and systems.

* Mean Time Between Failure (MTBF) is an industry standard measurement of reliability and manufacturing quality.

Nortel Networks and the Environment

Nortel Networks is committed to being a leader in the telecommunications industry in protecting and enhancing the environment. To live up to this goal, the company must continually develop innovative approaches to managing the environmental impact of its products from conception to final disposition.

Environmental excellence is excellent business. Nortel Networks' experience demonstrates that sound environmental management can bring financial benefits. By aiming for both economic and ecological efficiency, the company has reduced costs and begun to fulfill its social responsibility toward future generations.

Nortel Networks' corporate Environmental Management Systems Standard uses quality management approaches as a model. It orients the company's comprehensive environmental protection program to a continuous improvement focus, and helps managers in Nortel Networks operations around the world systematically scrutinize all activities looking for inefficiency and unnecessary waste. At the heart of the program are the company's employees, who are encouraged to innovate and influence business operations to help meet the corporation's environmental goals and targets. Each year, the company voluntarily submits its environmental record to public scrutiny.

Nortel Networks was the first in the telecommunications industry to eliminate the use of ozone-depleting chlorofluorocarbon (CFC-113) solvents from worldwide manufacturing and research operations. Such environmental achievements have won Nortel Networks prestigious awards from organizations such as the United Nations Environment Programme (UNEP) and the U.S. Environmental Protection Agency.

One key to Nortel Networks' success is its willingness to share technologies and expertise in protecting the environment. In several countries, Northern Telecom has volunteered to work with governments, customers and even its competitors for the benefit of the global environment.

Nortel Networks will continue to pursue its mission of leadership and stewardship, setting new goals and meeting new challenges through innovation, determination and dedication.

Hardware

Norstar Integrated Communications System (ICS)

Typically, the small site business market is made up of users who need communications systems with 3 to 150 telephones. Norstar is the worldwide market leader in small-site voice communications systems. Two core units, the Norstar Compact ICS and Norstar Modular ICS, form the foundation of Norstar's continued success.

The Compact ICS targets small businesses requiring 4 to 20 telephones and the resources to take advantage of new technological advances in the telecommunications industry.

The Compact ICS starts as a 4x16 (4 lines x 16 station ports) system and can grow to a 16x24 system, utilizing ISDN-BRI or a combination of analog and ISDN-BRI trunks, without replacing the core unit. A 4x8 configuration is also available for situations where a lower price is essential.

Since the Norstar telephone sets and most peripheral equipment presently operating on older Norstar core systems will work on the Norstar Compact ICS, the Compact ICS is an attractive upgrade for users who currently have 3x8 or Compact 6x16 systems. Compact ICS also provides a smooth transition to the Modular ICS by allowing trunk cartridges, terminals, wiring and applications to be reused on the larger system.

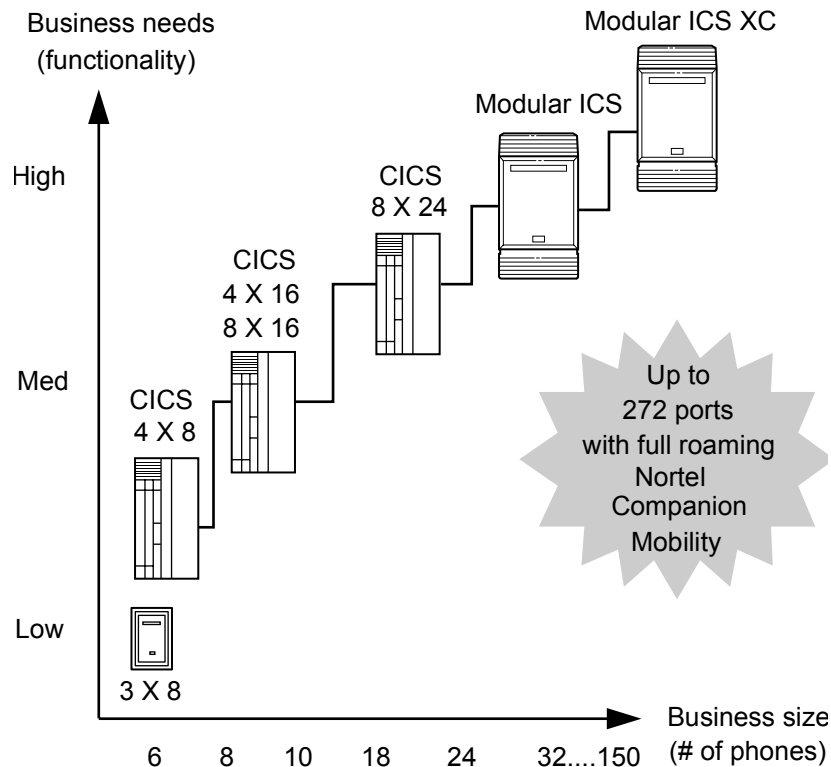
The Modular ICS targets businesses that require between 20 and 150 telephones and capabilities which allow for more power, more growth and more advanced applications.

The Modular ICS core unit is equipped with 32 station ports and two slots for the addition of T1 / ISDN-PRI, ISDN-BRI or analog trunk cartridges. Customers may grow this capacity as required, by adding fiber station modules, fiber trunk modules and analog station modules, to a maximum capacity of 272 ports.

The Modular ICS provides existing Norstar Modular 8x24 customers with the opportunity to upgrade to more advanced technology, such as T1, ISDN, and Nortel Companion mobility, and larger system capacities, while maintaining much of their existing common equipment.

The Norstar 3x8 system will continue to be offered for small businesses who need basic key system features but do not require the advanced digital capabilities of the ICS portfolio.

Norstar Portfolio



Norstar Core Units

Each Norstar core unit includes a power supply, an interface to connect outside lines and stations, and programmable memory. In addition, the Compact ICS and Modular ICS have separate, upgradable feature cartridges.

The Norstar core units are energy efficient, requiring low power consumption, and use standard grounded wall sockets. Analog devices are supported by either an Analog Terminal Adapter or the Analog Station Module (Modular ICS only). The polarity-insensitive single-pair of twisted wire used for wiring stations makes installation simple.

Note: As of 20 February 1997, the following are retired from the Norstar product line: Norstar Compact 6x16, Norstar Modular 8x24, Norstar 3x8 DR1 and Norstar 3x8 Basic (US only).

As of 1 April 2000, the following are retired from the Norstar product line: Modular 8x24 Expansion Cartridges, Copper Station Modules, Copper Trunk Modules and the 1A2 Trunk Cartridge.

Previous users of the Norstar 0x32 system should note that the Key Service Unit (KSU) has been renamed the Integrated Communication System (ICS).

Today's business world is evolving. A business that would have been classified as a "small" business in the past might now have the same requirements for sophisticated features and performance as a business many times its size. These businesses are better thought of as "small site" businesses with big-business demands for the latest advances in:

- Mobility,
- Messaging (voice, fax, e-mail),
- Call centers,
- Networking (LAN/WAN),
- Simultaneous transmission of voice, data and video,
- Computer/telephone integration and software applications,
- Digital imaging,
- Faster processing,
- Video conferencing.

The Norstar product family meets this growing market challenge with solutions that meet the needs of even the most sophisticated small systems customer.

Compact ICS Customer Profile

Norstar Compact ICS responds to the following trends in the small business market:

- The market is primarily driven by the needs of the traditional small-site business.
- The small business market is rapidly changing from basic telephony requirements to enhanced, integrated needs. The market is looking for solution providers; applications that can provide a competitive differentiation are driving change.
- Businesses now expect their communication system to handle their current needs, have the flexibility and capability to meet their future growth needs, and protect their investment.
- The ISDN network is being deployed rapidly, and the speed at which it can transmit information will allow new applications to be developed for competitive advantage. Compact ICS delivers full ISDN-BRI functionality.

The competitively priced Norstar Compact ICS meets the existing telephony requirements of small businesses, and can take them an additional step into new technology. The product is an exciting and simple solution that accommodates future growth, both in the number of lines and the available technology. It has a high feature-to-price ratio, which shows value both today and in the future.

Compact ICS Configuration

Two universal slots in the Compact ICS can accept any combination of the following trunk cartridges:

- 2-port U Interface ISDN-BRI,
- 4-port U Interface ISDN-BRI,
- 4-port S/T Interface ISDN-BRI,
- Loop Start analog,
- Caller ID analog.

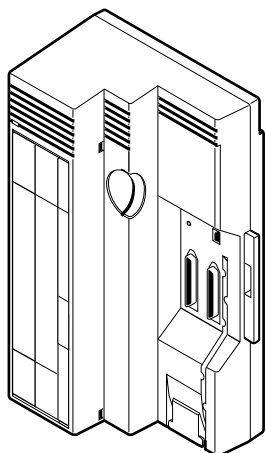
The following table outlines the possible configurations for Compact ICS:

Software	Universal slot 1	Universal slot 2	Expansion slot	Maximum size
Restricted	Analog			4x8
Restricted	2-port U ISDN		Services	4x8
Standard	Analog			4x16
Standard	2-port U ISDN		Services	4x16
Standard	4-port U ISDN		Services	8x16
Standard	Analog	Analog		8x16
Standard	Analog	2-port U ISDN	Services	8x16
Standard	Analog	2-port U ISDN	Combination	8x24
Standard	Analog	4-port U ISDN	Services	12x16
Standard	Analog	4-port U ISDN	Combination	12x24
Standard	2-port U ISDN	2-port U ISDN	Services	8x16
Standard	2-port U ISDN	2-port U ISDN	Combination	8x24
Standard	2-port U ISDN	4-port U ISDN	Services	12x16
Standard	2-port U ISDN	4-port U ISDN	Combination	12x24
Standard	2-port U ISDN	4-port S/T ISDN	Services	4x20 (16 TCM + 4 S/T ISDN)
Standard	2-port U ISDN	4-port S/T ISDN	Combination	4x28 (24 TCM + 4 S/T ISDN)
Standard	4-port U ISDN	4-port U ISDN	Services	16x16
Standard	4-port U ISDN	4-port U ISDN	Combination	16x24
Standard	4-port U ISDN	4-port S/T ISDN	Services	8x20 (16 TCM + 4 S/T ISDN)
Standard	4-port U ISDN	4-port S/T ISDN	Combination	8x28 (24 TCM + 4 S/T ISDN)

Note: Analog trunk cartridges can be either Loop Start or Caller ID.

This table assumes the use of all U Interfaces as network side connections, and the use of all S/T Interfaces as station side connections. The U Interfaces may be configured for station side connection and S/T Interfaces may be used for network side connections. (Use of an S/T Interface on the network side requires a customer-supplied NT1 Interface device.)

Compact ICS Core Hardware



Description

Length: 435 mm (17.3 in.)

Width: 238 mm (9.4 in.)

Depth: 168 mm (6.63 in.)

Weight: 3.05 kg (6.7 lb.)

Color: Dolphin Grey

- The Core Unit is easily mounted using 3 screws.
- A Services Cartridge plugs into the Core Unit expansion slot to provide synchronization to network timing for ISDN-BRI trunk cartridges.

A Combination Services Cartridge is available to provide both timing for ISDN-BRI trunk cartridges, and expansion from 16 to 24 station ports. (No Trunk Modules or Station Modules are required for expansion.)

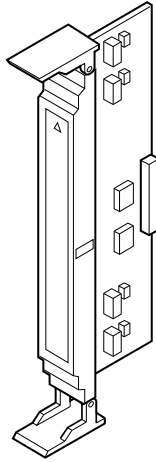
- Two 50-pin amphenol connections are used as the interface for CO trunks, stations, and for the internal ATA and RAD connections. The amphenols are also used for connection of external devices such as music on hold source, paging and auxiliary ringers.
- The Internal Analog Terminal Adapter (I-ATA) provides one connection for a modem, fax machine or analog telephone, and does not take up a station port.
- For the customer who does not have a battery backup system, Emergency Line Transfer Connection provides a line to connect a 2500 set in the event of a power failure. Only available if the Compact ICS is configured with at least one analog line.
- An optional software key code can be purchased to enable the Internal Remote Access Device (IRAD).

Once the IRAD is enabled, Norstar Remote Utilities software, allows remote programming for adds, moves, changes and troubleshooting. Moves, adds and changes can now be done from a single remote site, eliminating the need for a site visit.

- Remote administration translates into more efficient and faster response time when adds, moves or changes are required. Operational costs are reduced and the quick response time boosts customer satisfaction.
- Remote Tools is a component of Norstar Remote Utilities (NRU). Remote Tools provides Windows-based capabilities for configuring, programming, backing up and maintaining the Norstar Compact ICS and peripherals. See the Norstar Remote Administration Chapter for more information.

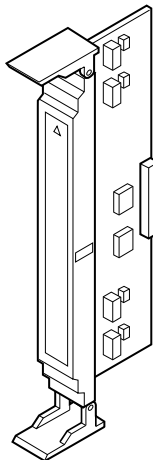
Compact ICS Interface Cartridges

LS/DS Analog Trunk Cartridge



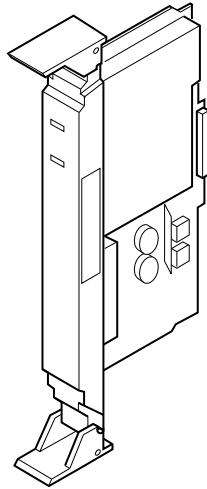
- Provides access for up to four Central Office analog lines.
- All LS (Loop Start)/DS (Disconnect Supervision) Trunk Cartridges have Disconnect Supervision capability and are labeled “DS” on the faceplate.
- Also called the New DS Loop Start Trunk Cartridge.
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

Caller ID Analog Trunk Cartridge



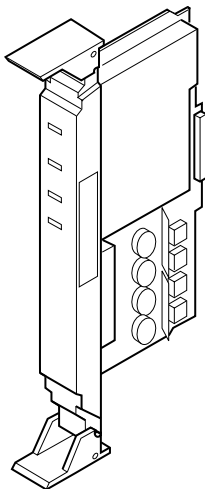
- The Caller Identification (CI) Trunk Cartridge has the same functionality as the LS/DS Trunk Cartridge but with the additional capability to detect and translate incoming CMS/CLASS information for display on Norstar sets.
- The CI Trunk Cartridge is required when any CMS/CLASS lines terminate on the Compact ICS core or the Modular ICS core or trunk modules.
- Provides access for up to four Central Office analog lines.
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

2-Port U Interface ISDN-BRI Cartridge



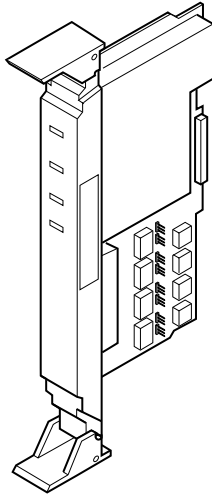
- Supports two ISDN-BRI U Interfaces per cartridge.
- Integrated Network Termination Type 1 (NT1) functionality.
- Interfaces can be individually configured to be a network interface or a station side equipment interface.
- Powered by the cartridge slot connector.
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS.
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

4-Port U Interface ISDN-BRI Cartridge



- Supports four ISDN-BRI U Interfaces per cartridge.
- Integrated Network Termination Type 1 (NT1) functionality.
- Interfaces can be individually configured to be a network interface or station side equipment interface.
- Powered by the cartridge slot connector.
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS.
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

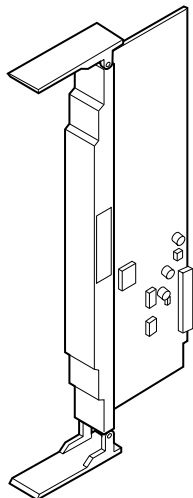
4-Port S/T Interface ISDN-BRI Cartridge



- Supports four ISDN-BRI S/T Interfaces per cartridge.
- Interfaces can be individually configured to be a network interface or a station side equipment interface. Use on the network side requires a customer-supplied NT1 interface device.
- Powered by the cartridge slot connector.
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS.
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

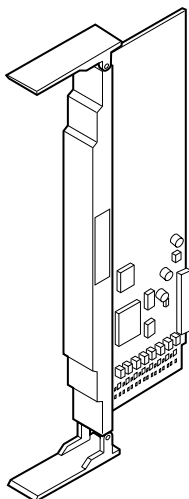
Compact ICS Clock Services/Expansion Cartridges

Services Cartridge



- Provides clocking for ISDN-BRI circuits.
- Only required if using ISDN-BRI cartridge; with 16 or fewer stations.
- Installs in the Expansion Card slot in the core unit.
- Compatible with Compact ICS only.

Combination Services Cartridge



- Provides clocking for ISDN-BRI circuits and expansion from 16 to 24 station ports.
- Required for TCM port expansion.
- The Combination Services Cartridge replaces the 8-Port TCM Expansion Cartridge, which is no longer available.
- Compatible with Compact ICS only.

Compact ICS Expansion

Restricted to Standard Software Key Code Upgrade

The Compact ICS 4x8 Restricted Software can be upgraded by purchasing the Restricted to Standard Software Key Code. This software key code immediately enables the additional 8 stations within the core unit, making 16 stations available without additional hardware.

The software key code also enables the second universal trunk slot to support an additional trunk cartridge. Adding a Combination Services Cartridge allows further station expansion from 16 to 24.

The 4x8 software cartridge itself does not have to be replaced at any time during this expansion process.

On a Compact ICS 4x16 system with Standard Software, adding a Combination Services Cartridge expands the number of station ports from 16 to 24.

More lines are added by purchasing either an analog trunk cartridge (for 4 CO lines) or an ISDN-BRI cartridge (for up to 8 ISDN digital circuits). The cartridge is inserted in the second universal trunk slot on the core unit.

Internal Remote Access Device Key Code Upgrade

The IRAD Software Key Code allows a customer who has purchased a Compact ICS with Standard Software or Restricted Software to enable the internal Remote Access Device.

Compact ICS Core Unit Bundles

The tables below show the four Compact ICS core unit bundles that can be ordered, and how to expand them:

Action	Item purchased	Part #
To start with a 4x8 system and four LS/DS analog lines	Purchase a Compact ICS equipped with an LS/DS Analog Trunk Cartridge and Compact ICS 4.1.1 Restricted Software ¹ (comes with English documentation)	Bundle A0652667
	or Compact ICS 4.1.1 Standard Software ¹ (comes with English documentation).	A0840243
		A0840240
To add 4 analog lines	Purchase Restricted to Standard Software Key Code for upgrade (only if Restricted Software on system) and Purchase an LS/DS Analog Trunk Cartridge	A0659207
	or a Caller ID Analog Trunk Cartridge.	A0405799
		A0393277
To add 4 ISDN circuits	Purchase a 2-port U Interface ISDN-BRI Cartridge and a Services Cartridge.	A0652049
		A0652074
To add 8 ISDN circuits	Purchase a 4-port U Interface ISDN-BRI Cartridge or Purchase a 4-port S/T Interface ISDN-BRI Cartridge	A0652051
	and a Services Cartridge.	A0633567
		A0652074
To add 8 station ports	Purchase Restricted to Standard Software Key Code for upgrade (only if Restricted Software on system).	A0659207

Action	Item purchased	Part #
To add 16 station ports	Purchase a Combination Services Cartridge.	A0652072
To start with a 4x8 system and four Caller ID analog lines	Purchase a Compact ICS equipped with a Caller ID Analog Trunk Cartridge and Compact ICS 4.1.1 Restricted Software ¹ (comes with English documentation) or Compact ICS 4.1.1 Standard Software ¹ (comes with English documentation).	Bundle A0652668 A0840243 A0840240
To add 4 analog lines	Purchase Restricted to Standard Software Key Code for upgrade (only if Restricted Software on system) and Purchase a LS/DS Analog Trunk Cartridge or a Caller ID Analog Trunk Cartridge.	A0659207 A0405799 A0393277
To add 4 ISDN circuits	Purchase a 2-port U Interface ISDN-BRI Cartridge and a Services Cartridge.	A0652049 A0652074
To add 8 ISDN circuits	Purchase a 4-port U Interface ISDN-BRI Cartridge or Purchase a 4-port S/T Interface ISDN-BRI Cartridge and a Services Cartridge.	A0652051 A0633567 A0652074
To add 8 station ports	Purchase Restricted to Standard Software Key Code for upgrade (only if Restricted Software on system).	A0659207
To add 16 station ports	Purchase a Combination Services Cartridge.	A0652072
To start with a 4x16 system and 4 ISDN-BRI "U" circuits	Purchase a Compact ICS equipped with a 2-port U Interface ISDN-BRI Cartridge and a Services Cartridge and Compact ICS 4.1.1 Standard Software ¹ (comes with English documentation).	Bundle A0655689 A0652074 A0840240
To add 4 analog lines	Purchase a LS/DS Analog Trunk Cartridge or a Caller ID Trunk Cartridge.	A0405799 A0393277
To add 4 ISDN circuits	Purchase a 2-port U Interface ISDN-BRI Cartridge.	A0652049
To add 8 ISDN circuits	Purchase a 4-port U Interface ISDN-BRI Cartridge or Purchase a 4-port S/T Interface ISDN-BRI Cartridge.	A0652051 A0633567
To add 8 station ports	Purchase a Combination Services Cartridge.	A0652072
To start with a 4x16 system and 8 ISDN-BRI "U" circuits	Purchase a Compact ICS equipped with a 4-port U Interface ISDN-BRI Cartridge and a Services Cartridge and Compact ICS 4.1.1 Standard Software ¹ (comes with English documentation).	Bundle A0655691 A0652074 A0840240
To add 4 analog lines	Purchase a LS/DS Analog Trunk Cartridge or a Caller ID Trunk Cartridge.	A0405799 A0393277
To add 4 ISDN circuits	Purchase a 2-port U Interface ISDN-BRI Cartridge.	A0652049
To add 8 ISDN circuits	Purchase a 4-port U Interface ISDN-BRI Cartridge or Purchase a 4-port S/T Interface ISDN-BRI Cartridge.	A0652051 A0633567
To add 8 station ports	Purchase a Combination Services Cartridge.	A0652072
Note 1: Compact ICS 4.1.1 Standard Software is also available with IRAD-enabled—A0840244. Compact ICS 4.1.1 Restricted Software is also available with IRAD-enabled—A0840246.		

Modular ICS Customer Profile

A Norstar Modular ICS customer is looking for increased processing power, networking capability and advanced features that can be customized to fit both present and future communications needs.

The Modular ICS customer wants the ability to integrate high value applications to their system as the business need arises: advanced Voice Mail, Call Center Applications, integrated Mobility, Internet Access, ISDN and Desktop CTI.

The Modular ICS customer also wants to take full advantage of network services such as Calling Line ID, to improve customer satisfaction and business efficiencies.

And the Modular ICS customer wants the assurance that their investment will be protected because their system can grow both in size and functionality. Norstar Modular ICS brings all of these values while preserving the simplicity of use that has become the Norstar trademark in the industry.

Modular ICS T1 - Customer Profile

A Modular ICS Customer will choose T1 for several reasons. Businesses that require greater bandwidth will first need to look at the economics of T1. Because the cost of installing T1 is dropping rapidly, more and more businesses are finding T1 is a viable option.

Fractional T1 allows a company to use part of a T1 circuit (for example, 10 rather than 24 lines). This option makes it economical for the traditional Norstar system and hybrid telephone user to purchase T1.

Beyond economics, T1 provides quality of service with enhanced features. T1 is attractive to companies looking for the ability to change bandwidth as required and to managing their own network.

Modular ICS ISDN-PRI - Customer Profile

The Modular ICS with PRI has been designed for the customer who has a requirement for high speed information access or transfer. This customer is one who currently uses T1 lines and is presently constrained by using dedicated voice and data lines. The PRI customer likely has a larger station size key system. The Modular ICS with PRI will appeal to the customer who is sensitive to the savings gained from call by call service selection as this could represent an average minimum cost and efficiency savings of 20% over T1 systems.

Customers who have employees who telecommute and need access to company databases, networks, e-mail, etc., and those who have employees who frequently travel to attend meetings are likely PRI prospects. Customers who use multiple analog lines for telephone, fax and modem, as well as those who require data transfer or sharing of databases between multiple locations, will benefit greatly from the Modular ICS with PRI.

Modular ICS ISDN-BRI - Customer Profile

The BRI option for Modular ICS is designed for the customer who wants the speed and reliability of digital lines with the added flexibility and features of ISDN-BRI. The BRI customer likely has a smaller station size key system than the PRI customer.

With BRI lines, customers can integrate their ICS with ISDN equipment and applications, and take advantage of the central office services offered for ISDN. Like T1, ISDN-BRI offers an economical option for backing up leased lines.

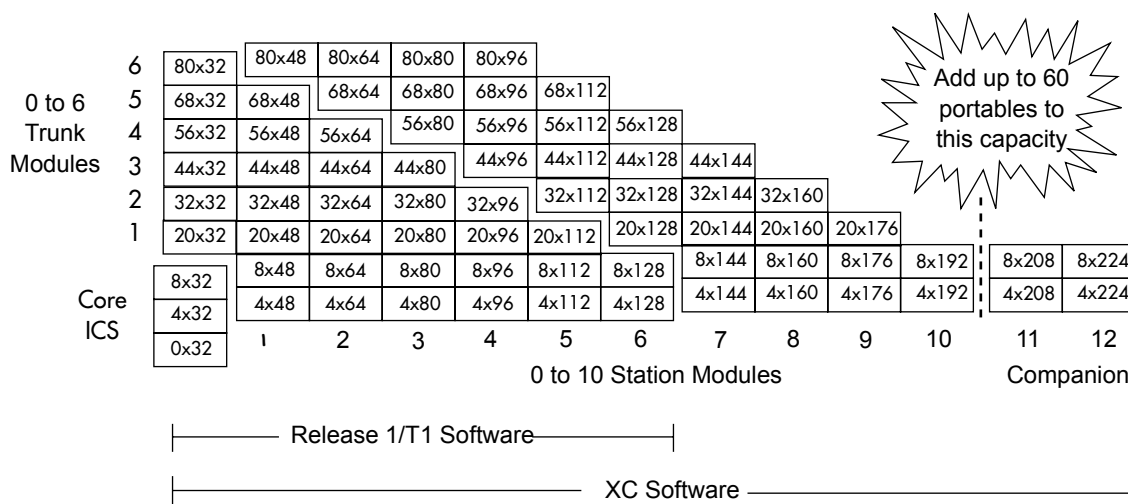
Modular ICS XC - Customer Profile

A customer for Modular ICS equipped with XC software is looking for a larger system configuration (12-port expandability) to meet the needs of a large or growing company. They want integration with the latest technology, such as voice processing, T1/PRI trunking, and mixed analog/digital configuration that will maximize their system use.

For a business that currently owns a Modular ICS, XC software is an easy and cost-effective way to upgrade to a more advanced system with more possibilities for integration. A customer for Modular ICS equipped with XC software is looking for Companion wireless mobility functionality to allow employees to be easily accessible anywhere in the building or on the surrounding grounds.

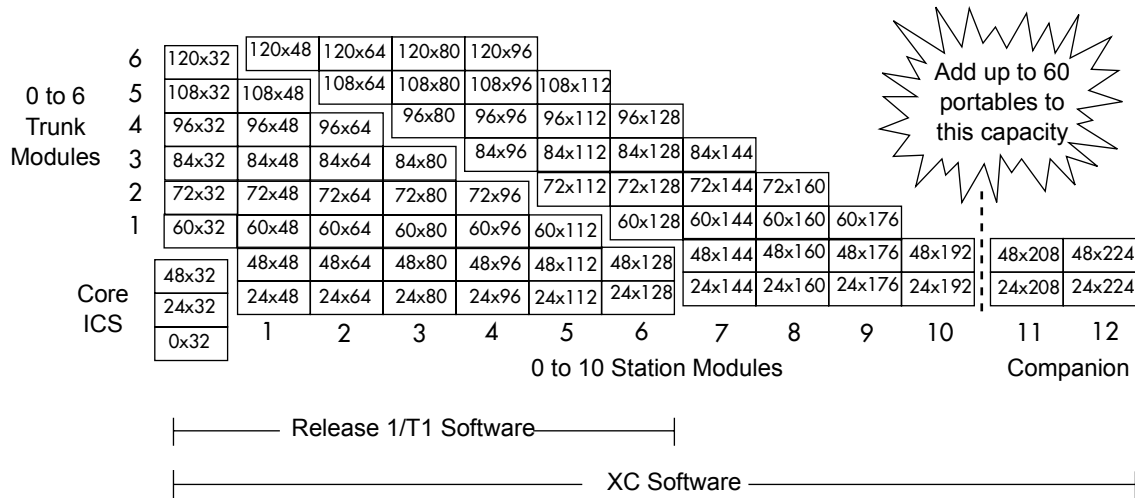
Modular ICS Configuration

This chart shows possible configurations for a Modular ICS connected to analog trunks. It shows two Analog Trunk Cartridges (ATC) and no Digital Trunk Interface (DTI) or Basic Rate Interface (BRI) Cartridges installed in the ICS. The configuration capacity depends on the software cartridge.

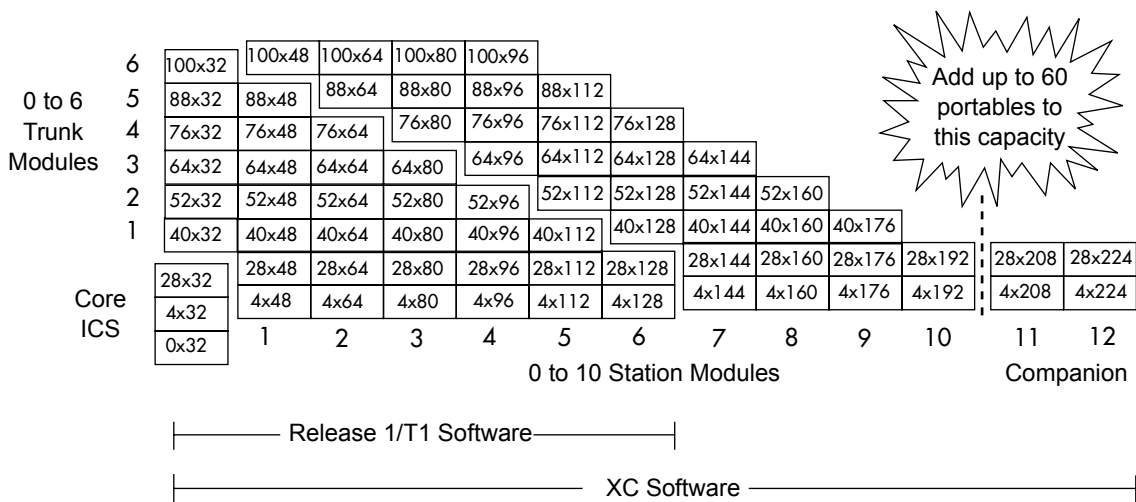


Note: These configuration charts are examples only and do not encompass the full range of trunking options associated with ISDN-BRI interface cartridges or E&M trunk cartridges.

This chart shows possible configuration options for a Modular ICS connected to T1 or ISDN-PRI trunks. It shows two DTI Cartridges and no Analog Trunk Cartridges installed in the ICS. The configuration capacity depends on the software cartridge.



This chart shows possible configuration options for a Modular ICS connected to both T1 (or ISDN-PRI) and analog trunks. It shows one Analog Trunk Cartridge and one DTI Cartridge installed in the ICS. The configuration capacity depends on the software cartridge.



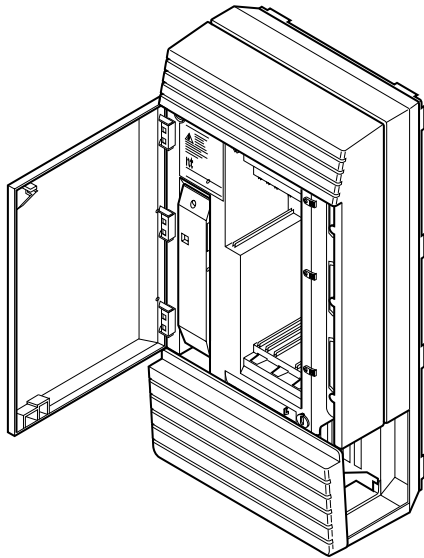
Modular ICS Expansion

The Modular ICS system can support up to 12 additional modules, each connected to the core unit via a fiber DS-30 connector. The table below summarizes the expansion capability.

Expansion Port	Fiber Trunk Module	Fiber Station Module	Analog Station Module		
3	Supports LS/DS, CI, DID, E&M and ISDN-BRI	Each module supports the addition of 16 incremental digital station ports ¹	Each port supports an Analog Station Module for 8 ports of analog connectivity. A second ASM may be daisy-chained to the first ASM to provide a total 16 ports of analog connections per fiber expansion port.		
4					
5	Supports LS/DS, CI, DID and E&M				
6					
7					
8					
9	Not supported			Reserved for Companion Base Stations	Not supported
10					
11					
12					
13					
14					

Note 1: For systems with less than 12 ports of expansion, Companion Base Stations must be connected to the two highest fiber expansion ports.

Modular ICS Core Hardware

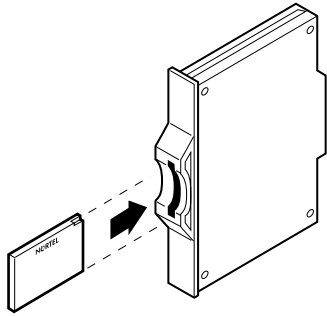


Description

Length:	63 cm (24.8 in.)
Width:	30 cm (11.8 in.)
Depth:	17 cm (6.7 in.)
Weight:	14 kg (30.8 lb.)
Color:	Dolphin Grey

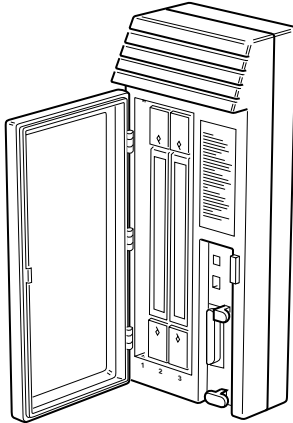
- The Norstar Modular ICS is a module and cartridge-based system offering easy installation, maintenance, expansion and customization.
- The Modular ICS supports digital T1 lines, ISDN Primary Rate Interface (PRI) and Basic Rate Interface (BRI) circuits, as well as Analog Loop Start, CI, DID and E&M lines.
- All lines are supported through cartridges installed in either the core Modular ICS or Trunk Modules (see configuration charts on the previous pages).
- The removable power supply eliminates the need to send the entire ICS in for repair if the power supply fails.
- Modular ICS customers looking to expand to a large system can use the capability of Modular ICS with XC software to grow to 272 ports.
- Modular ICS XC offers Companion wireless functionality, allowing customers to install up to 32 Base Stations that support up to 60 portable handsets.
- Other features include support of 32 stations on the core Modular ICS, a single locking door, a label for customer configuration information, and an optional Fiber Cable Management Kit to speed installation and ensure proper handling of the fiber connection cables.
- The Modular ICS has one emergency transfer port per trunk cartridge slot if an analog trunk cartridge is installed in the Modular ICS. In a system with Digital Trunk Cartridges only, emergency service is not supported.
- Each cartridge slot in the Modular ICS can house:
 - One-piece or two-piece software feature cartridge,
 - Services Cartridge,
 - Fiber or Copper Trunk and Station Modules,
 - Combination Expansion and Services Cartridges,
 - ISDN-BRI, Digital, LS/DS Analog and Caller ID Trunk Cartridges.

Software Feature Cartridge



- The Feature Cartridge contains the system software for Modular ICS operation, including the call processing, administration, and maintenance features and functions.
- The two-piece cartridge contains expanded RAM and system software on a PCMCIA card.
- Customer data (RAM) is stored on the ICS and is preserved during software upgrades and power outages.
- Four versions of software are available:
 - NA-Modular ICS-DR 4.1.1—Expanded feature capability. Supports up to 6 expansion modules,
 - CDA-Modular ICS-XC-4.1.1—Expanded capability and Companion wireless functionality. Available in Canada. Supports up to 12 expansion modules,
 - USA-Modular ICS-XC-4.1.1—Expanded capability and Companion wireless functionality. Available in the US. Supports up to 12 expansion modules,
 - Release 1, Centrex—Provides transparent operation of popular Centrex features. It does not support T1, ISDN-PRI, ISDN-BRI, Companion or expansion beyond 6 ports.

Fiber Trunk Module (12x0)



Description

Length: 625 mm (24.6 in.)
 Width: 198 mm (7.8 in.)
 Depth: 171 mm (6.73 in.)
 Weight: 5142 g (11.33 lb.)
 Color: Dolphin Grey

- To add trunk interfaces to the core Modular ICS, Fiber Trunk Modules may be connected to the Modular ICS by a fiber cable.
- Each Fiber Trunk Module (TM) holds up to three Trunk Cartridges. The number of additional lines depends on the cartridge being installed:

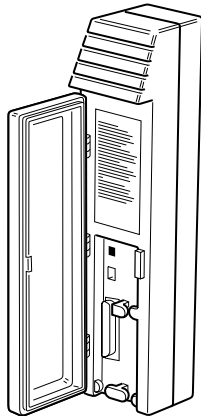
Card	Lines per card
ISDN-BRI	8
LS/DS	4
CI	4
DID	4
E&M	2
1A2	4

- There is one emergency transfer port per Trunk Module.
- All analog trunk cartridges are supported in the Fiber Trunk Module. Digital Trunk Interface (DTI) Cartridges and the Services Cartridges are not supported in the Fiber Trunk Module.
- ISDN-BRI Cards are supported only on Trunk Modules 3 and 4 (2-port expansion), or Trunk Modules 7 or 8 (6- or 12-port expansion).

Note: Copper Trunk Modules used with the Modular 8x24 are also compatible with the Modular ICS and can be used for an upgrade. Copper Trunk Modules connect to the core with a Copper DS-30 cable and a 2- or 6- port Modular ICS Copper Expansion Cartridge.

Effective April 1, 2000, the Copper Trunk Module, Copper Station Module, Copper Expansion Cartridges and the 1A2 Trunk Cartridge are retired from the Norstar product portfolio.

Fiber Station Module (0x16)



Description

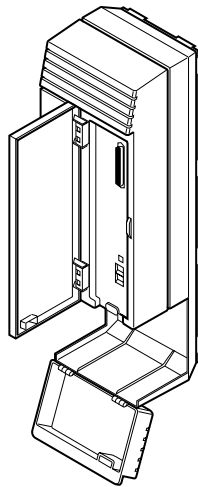
Length: 625 mm (24.6 in.)
 Width: 98 mm (3.85 in.)
 Depth: 171 mm (6.73 in.)
 Weight: 2415 g (5.31 lb.)
 Color: Dolphin Grey

- To add additional station ports to the Modular ICS core, Fiber Station Modules may be connected by a fiber cable.
- Each Fiber Station Module expands the core Modular ICS system by up to 16 station ports.

Note: Copper Station Modules used with the Modular 8x24 are also compatible with the Modular ICS and can be used for an upgrade. Copper Station Modules connect to the core with a Copper DS-30 cable and a 2- or 6- port Modular ICS Copper Expansion cartridge.

Effective April 1, 2000, the Copper Trunk Module, Copper Station Module and Copper Expansion Cartridges are retired from the Norstar product portfolio.

Analog Station Module (ASM)



Description

Length: 630 mm (25 in.)
 Width: 150 mm (5.9 in.)
 Depth: 170 mm (6.5 in.)
 Weight: 3.7 kg (8.3 lb.)
 Color: Dolphin Grey

- The Analog Station Module is compatible with Modular ICS products with fiber interface capabilities.
- Each ASM can support 8 analog devices (data or voice) with speeds up to and including 33.6 Kbps. (Note: the maximum data transmission rate is subject to the quality of the end-to-end channel and cannot be guaranteed.)
- Each ASM has 3 connectors: one DS-30 fiber link for daisy-chaining, and one 50-pin male amphenol connector that provides connections for up to 8 analog devices.
- The ASM connects to a Fiber Expansion Cartridge on the core Modular ICS with a DS-30 fiber cable. Either a 2- or 6- port Fiber Expansion Cartridge may be used.
- The second DS-30 jack on the ASM may be used to daisy-chain a second ASM to the first. A maximum of two ASMs, providing a total of 16 analog ports, can be connected through a single DS-30 port on an Expansion Cartridge.
- The ASM has an integrated auto ranging 110 - 220 volt power supply and is approximately 1.5 times wider than the Fiber Station Module.

- A third ASM can connect via a DS-30 fiber link to the next available port on the Expansion Cartridge. A fourth ASM can be daisy-chained to the third ASM. The total number of ASMs that can be installed on a system is determined by the number of DS-30 ports available on the core.
- Two versions of the ASM are available:
 - Standard Analog Station Module (ASM) M0x8A,
 - Analog Station Module with Message Waiting Indication (ASM with MWI) M0x8M.
- The ASM with MWI supports visual message indication (on 2500 sets with a message lamp provided) or stuttered dial tone (when the handset is lifted).

Note: the standard ASM does not provide visual message waiting indication but can be configured to provide a stuttered dial tone if connected to a Modular ICS with DR 1.1 software or later. The standard ASM cannot be upgraded to an ASM with MWI.

- The standard ASM is compatible with all Modular ICS software releases. The ASM with MWI is compatible only with DR 1.1 and XC 1.1 software or later.
- The ASM, and the ASM with MWI, may be used in combination with each other and/or with existing ATA-2s, allowing for customized analog solutions. All features currently supported on the ATA-2 are supported by both versions of the Analog Station Module.
- The maximum loop length for any On Premise analog station is 4,000 feet.

Off Premise Extensions (OPX) are not supported from the ASM. The existing ATA-2 devices will still be used to support OPX extensions.

- CLASS/CMS capabilities and Disconnect Supervision are not supported on the Analog Station Module. This is consistent with ATA-2 functionality. For analog connections requiring Disconnect Supervision, a Voice Mail Interface Unit is required.

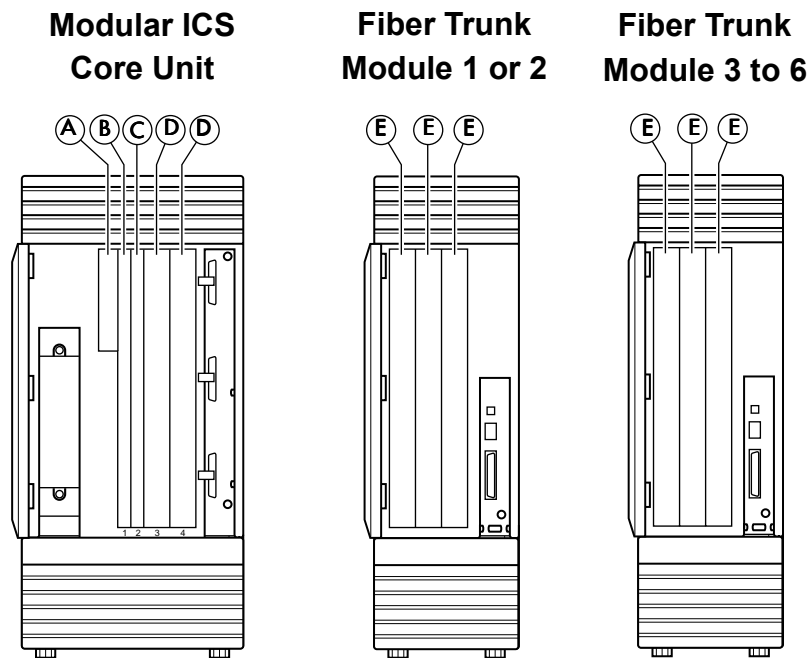
Modular ICS Cartridges

- Expansion Cartridges provide the connection point for expansion of the system via trunk or station modules.
- Services Cartridges contain the clocking services to support ISDN and T1.
- Interface Cartridges connect the Norstar system with the central office, and in the case of ISDN-BRI cartridges may be configured for station side ISDN devices.

Modular ICS Cartridge Compatibility

Cartridges	Modular ICS	
	Core	Fiber Trunk Module
Expansion		
Modular ICS Fiber Expansion 2-port	√	
Modular ICS Fiber Expansion 6-port	√	
Clocking Services/Expansion		
Services Cartridge	√	
Modular ICS Combination Fiber 6-Port Services Cartridge	√	
Interface		
ISDN-BRI 2 U-Interface	√	√ ¹
ISDN-BRI 4 U-Interface	√	√ ¹
ISDN-BRI 4 S/T Interface	√	√ ¹
Digital Trunk Interface	√	
LS/DS Analog Trunk Cartridge	√	√
Caller ID Trunk Cartridge	√	√
E&M/DISA Trunk Cartridge		√
DID Trunk Cartridge		√
Norstar Data Interface		
Note 1: ISDN-BRI 2 U-Interface, 4 U-Interface and 4 S/T Interface cartridges can be installed in Fiber Trunk Modules 1 and 2 only. (Copper Expansion Cartridges, Copper Trunk Modules, Copper Station Modules and 1A2 Trunk Cartridges are retired from the Norstar product portfolio as of April 1, 2000.)		

Modular ICS Cartridge Placement

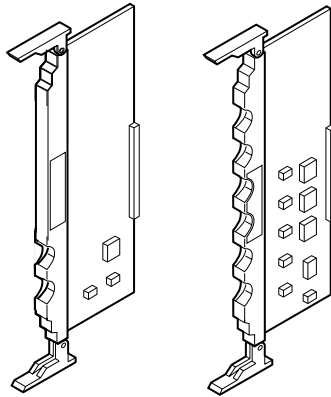


Modular ICS Core Unit	
Slot A	Modular ICS or Modular ICS XC Software Cartridge
Slot B	Services Cartridge or combo 6-Port Services Cartridge
Slot C	2-Port, 6-Port or Combo 6-Port Services Cartridge
Slot D	2-Port "U", 4-Port "U" or 4-Port "S/T" ISDN-BRI Cartridges; Digital Trunk Interface, LS/DS Loop Start or CI Trunk Cartridges

Fiber Trunk Module 1 or 2	
Slot E	2-Port "U", 4-Port "U" or 4-Port "S/T" ISDN-BRI Cartridges; LS/DS Loop Start, CI, DID or E&M Trunk Cartridges

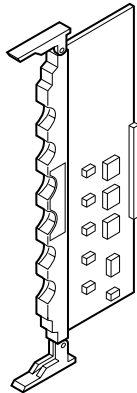
Fiber Trunk Module 3 to 6	
Slot E	LS/DS Loop Start, CI, DID or E&M Trunk Cartridges

Fiber Expansion Cartridges



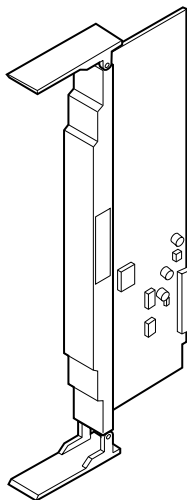
- 2- or 6-port Fiber Expansion Cartridges connect additional Fiber Trunk, Fiber Station, or Analog Station Modules to expand core Modular ICS capacity.
- The Fiber Expansion Cartridges fit into slot C (a half-width slot) of the ICS. The other half width slot (slot B) is reserved for the Services Cartridge.
- With XC software, two 6-port Expansion Cartridges can be installed in the Modular ICS, the first in Slot C, the second in Slot B.
- Compatible with the Module ICS core only.

Combination Fiber 6-Port Services Cartridge



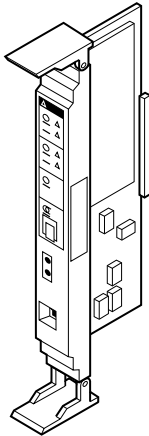
- The Modular ICS Combination Fiber 6-Port Services Cartridge connects additional Fiber Trunk and/or Station Modules to expand the core capacity of a Modular ICS equipped with XL or XC software to a maximum of 12 expansion ports (272 total ports maximum configuration).
- This cartridge also contains the clocking service required to support T1 or ISDN-PRI on a DTI cartridge or an ISDN-BRI Cartridge.
- The Combination Fiber 6-Port Services Cartridge fits into slots B and C of the Modular ICS and works with XC software, and regular DR 1.1 and later software. Requires fiber connections.
- Compatible with the Modular ICS core only.

Services Cartridge



- Provides the clocking service necessary for digital networks.
- Required if using DTI cartridge(s) or ISDN-BRI Interface cartridge(s).
- One Services cartridge supports all clocking required, regardless of the number or mixture of DTIs and/or ISDN-BRI Interface cartridges.
- Uses Slot B of the core ICS, and cannot be used if a Copper Expansion Upgrade Cartridge is installed.
- Compatible with the Modular ICS core only.

Digital Trunk Interface Cartridge

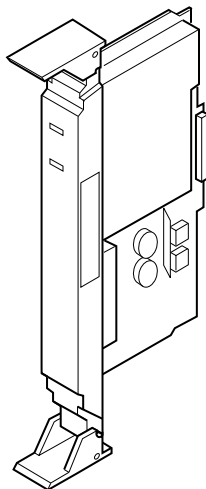


- The Digital Trunk Interface (DTI) cartridge provides access for up to 24 digital T1 or ISDN-PRI channels. It comes equipped with built-in Channel Service Unit (CSU) functionality to support the integrity of digital signaling.
- The core Modular ICS can support up to two DTIs for a total of 48 T1 or ISDN-PRI (digital) lines. DTIs cannot be installed in Trunk Modules.
- Requires either the Services Cartridge or the Combination Fiber 6-Port Services Cartridge.
- Compatible with the Modular ICS core only.

ISDN-PRI Enabler Soft Key

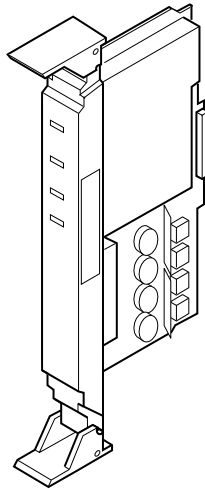
- The ISDN-PRI Enabler Soft Key is required to configure the Digital Trunk Cartridge (DTI Card) as a PRI card.

2-Port U Interface ISDN-BRI Cartridge



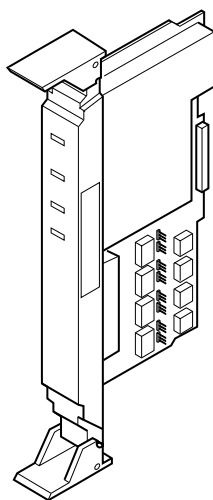
- Supports two ISDN-BRI U Interfaces per cartridge.
- Integrated Network Termination Type 1 (NT1) functionality.
- Interfaces can be individually configured to be a network interface or a station side equipment interface.
- Powered by the cartridge slot connector.
- LED on the cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS.
- Requires either the Services cartridge or the Combination Fiber 6-port Services cartridge on Modular ICS.

4-Port U Interface ISDN-BRI Cartridge



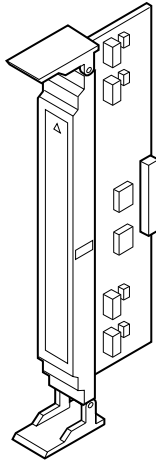
- Supports four ISDN-BRI U-Interfaces per cartridge.
- Integrated Network Termination Type 1 (NT1) functionality.
- Interfaces can be individually configured to be a network interface or station side equipment interface.
- Powered by the cartridge slot connector.
- LED on cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services Cartridge or Combination Services Cartridge on Compact ICS.
- Requires either the Services Cartridge or the Combination Fiber 6-port Services Cartridge on Modular ICS.

4-Port S/T Interface ISDN-BRI Cartridge



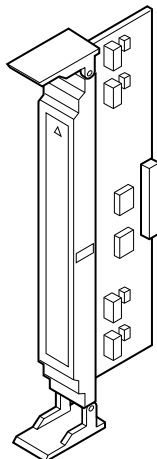
- Supports four ISDN-BRI S/T Interfaces per cartridge.
- Interfaces can be individually configured to be a network interface or a station side equipment interface. Use on the network side requires a customer-supplied NT1 interface device.
- Powered by the cartridge slot connector.
- LED on the cartridge faceplate gives visual indication of circuit status (activated or deactivated).
- Compatible with Compact ICS core and Modular ICS core and Fiber Trunk Module.
- Requires Services cartridge or Combination Services cartridge on a Compact ICS.
- Requires either the Services Cartridge or the Combination Fiber 6-port Services cartridge on a Modular ICS.

LS/DS Analog Trunk Cartridge



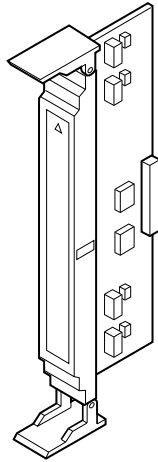
- Provides access for up to four Central Office analog lines.
- All LS (Loop Start)/DS (Disconnect Supervision) Trunk cartridges have Disconnect Supervision capability and are labeled with “DS” on the faceplate.
- Also called the New DS Loop Start Trunk Cartridge.
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

Caller ID Analog Trunk Cartridge



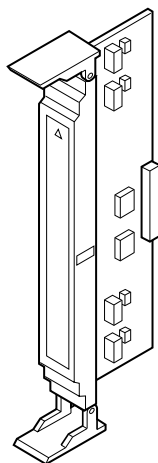
- The Caller Identification (CI) Trunk Cartridge has the same functionality as the LS/DS Trunk cartridge, but with the added capability to detect and translate incoming CMS/CLASS information for display on Norstar sets.
- The CI Trunk Cartridge is required when any CMS/CLASS lines terminate on the Modular ICS core or Trunk Module or Compact ICS core.
- Provides access for up to four Central Office analog lines.
- Compatible with the Modular ICS core, Fiber and Copper Trunk Modules, the Compact ICS core and the Modular 8x24 Copper Trunk Module.

E&M/Direct Inward System Access (DISA) Trunk Cartridge



- Provides E&M Tie line private networking between Norstars in a private networking configuration.
- Contains 2 E&M Type II Trunk interfaces.
- The cartridge also contains 2 DTMF receivers, required to support DISA on Loop-Start Trunks.
- Compatible with the Modular ICS Fiber Trunk Module and the Modular 8x24 Copper Trunk Module.

Direct Inward Dialing (DID) Trunk Cartridge



- Routes calls from the public network directly to sets, bypassing an attendant, reducing traffic to the central answering position.
- All DID Trunk Cartridges have Disconnect Supervision.
- DID trunks do not support CMS/CLASS services.
- Provides access for up to four (4) CO lines.
- Compatible with the Modular ICS Fiber Trunk Module and the Modular 8x24 Copper Trunk Module.

Norstar 3x8 Overview

Norstar 3x8 is a conveniently sized, easy-to-install, small business system that delivers many advanced features.

Norstar 3x8 Customer Profile (Small Business)

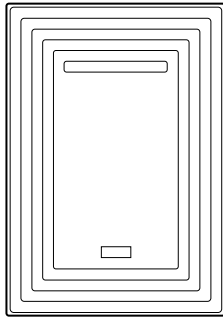
A Norstar 3x8 customer is a business that wants a fully featured key system because it offers: on-site equipment that can be customized, features that manage a high level of internal calling patterns (for example, paging, intercom, call handling), and the opportunity to control and maintain the communications system. The business requires up to a maximum of three lines and eight stations.

Norstar 3x8 Customer Profile (Home-based Business)

The Norstar 3x8 home-based business customer has needs similar to the small business profile, however, the home business customer will likely have the need for smaller configurations and at least one full-featured set (M7310) to meet many of the business operating needs.

Note: See Appendices for information on Compact 6x16, Modular 8x24 and other legacy products.

Norstar 3x8 Hardware



Description

Length: 330 mm (13 in.)
Width: 240 mm (9.5 in.)
Depth: 75 mm (3 in.)
Weight: 2 kg (4.4 lb.)
Color: Dolphin Grey

- The Norstar 3x8 is a self-contained unit that functions with built-in DR5 software. DR5 includes Disconnect Supervision and Calling Line ID interface capabilities.
- This system can be configured with up to three lines and eight stations (3x8).
- Offers advanced Norstar functionality, with many cost-saving set and system features not available with competitive systems.
- Custom programming enables a business to configure the system to best suit its particular needs.
- The Norstar 3x8 is easy to install and its small size means it will not take up much space.
- External (wall mountable) power supply.

Software

Overview

Today, key systems come with many powerful features. For you to gain the competitive sales edge, the customer must understand how easy it is to use Norstar features. To simplify feature access, Norstar offers:

- LCDs that guide the user through features, using visual prompts;
- Easily remembered, simple access codes;
- Memory buttons that save frequently used feature access codes;
- Single-button access programming to activate saved features.

In addition, Norstar's ease of programming and proven reliability provide high levels of customer satisfaction.

Norstar Modular ICS Release 4.1.1

Norstar Modular ICS Release 4.1.1 software provides all the features of Release 4.1, plus the following enhancement.

Message Waiting Lamp Indication

The combination of the Release 2 Business Series Terminals and the MICS 4.1.1 software now enables Norstar users to have a visual message waiting indication lamp in addition to the Message for You on the display of the telephone set.

The BST light not only still provides visual ringing on incoming calls, but also provides three visual indications, depending on feature activation. On an incoming call, the lamp flashes slowly; when a line is put on hold, the lamp flashes quickly; and when a message is left either in voice mail or by activating F1, the lamp stays on solidly.

With these unique flashing patterns and a fully adjustable LCD, Norstar systems equipped with Business Series Terminals keep users aware of incoming messages and call status with a single glance. This new capability continues to strengthen Norstar's value in increasing business productivity—employees can see from a distance if they have a message waiting, so there is no need to stop what they are doing to look at the display.

Modular ICS Software Cartridge Overview

The Modular ICS provides a high degree of customization and growth to suit individual user needs and provides the enhanced, integrated features and networking that small site businesses are demanding. Modular ICS XC software also supports Nortel Companion mobility, allowing customers to install up to 32 Base Stations and 60 portable telephones.

Norstar Modular ICS Release 4.1 includes all Release 4.0, 3.0, 2.0, 1.1, 1.0 and DR5 features. In addition, features like full ISDN-BRI and ISDN-PRI capability provide a high level of performance and the opportunity for leading edge business solutions such as networking and CTI.

Three versions of the Software Cartridge are available, based on the system requirements and market (US or Canada):

- Modular ICS 4.1 Software Feature Cartridge,
- USA — Modular ICS - XC 4.1 Software Feature Cartridge,
- CDA — Modular ICS XC 4.1 Software Feature Cartridge.

A fourth Software Cartridge is also available:

- Release 1 Centrex
 - Provides transparent operation of popular Centrex features. Does not support T1, ISDN-BRI, Companion or expansion beyond 6 ports.

Note: On an XC system, the maximum number of sets that can have the same line appearance is 50. This limit is reduced by 15 for every portable telephone that has an appearance of the line.

Norstar Compact ICS Release 4.1.1 Features

Norstar Compact ICS Release 4.1.1 includes all the features of Norstar Compact ICS 4.1, plus the following:

Message Waiting Lamp Indication

The combination of the Release 2 Business Series Terminals and the CICS 4.1.1 software now enables Norstar users to have a visual message waiting indication lamp in addition to the Message for You on the display of the telephone set.

Not only does the BST light still provide visual ringing on incoming calls, but it also provides three visual indications, depending on feature activation. On an incoming call, the lamp flashes slowly; when a line is put on hold, the lamp flashes quickly; and when a message is left either in voice mail or by activating F1, the lamp stays on solidly.

With these unique flashing patterns and a fully adjustable LCD, Norstar systems equipped with Business Series Terminals keep users aware of incoming messages and call status with a single glance. This new capability continues to strengthen Norstar's value in increasing business productivity—employees can see from a distance if they have a message waiting, with no need to stop what they are doing to look at the display.

Built-in Auto Attendant

The built-in Auto Attendant in the Compact ICS automatically answers and directs incoming calls. This feature can reduce or eliminate the workload of the person who answers incoming calls for an office.

Auto Attendant is a productivity tool that can provide stand-alone or supplementary telephone answering support 24 hours per day, 7 days per week. The Auto Attendant function can handle up to a maximum of 3 calls at once. Handling of two calls is guaranteed; handling of the third call is dependent on system traffic.

The Automated Attendant function is turned on and off within the system programming. The individual features, System Answer and Custom Call Routing, can be turned on and off from any telephone in the system. This flexibility gives the small business many options for handling incoming calls quickly and professionally.

The Auto Attendant allows a business to handle a large volume of calls in an efficient and professional manner, to help reduce operating costs and free up personnel to perform other duties.

Note that there is no voice mail functionality, such as leaving messages, etc., with the built-in Auto Attendant. One of the Norstar Voice Mail products, or third party voice mail, is required for true voice mail functionality.

System Answer

The System Answer feature simplifies the job of answering calls by making sure all calls are answered within a set number of rings. When calls go unanswered at the telephone monitored by System Answer (the attendant set), Norstar answers the call and plays a greeting. It then puts the call on hold until the attendant can retrieve it.

If the caller knows the internal number they want to reach, or is using the Norstar remote features, they can dial while the System Answer greeting is playing. System Answer backs up the attendant in periods of heavy traffic - ideal for a business that needs external calls answered quickly and professionally.

System Answer only handles calls that ring at the “Attendant Set”. All lines that appear on that set will be answered by System Answer while the feature is turned ON. Note that System Answer does not queue calls.

Custom Call Routing (CCR)

The Custom Call Routing feature can take over the job of answering and transferring calls. Lines programmed to be monitored by CCR will be answered after the programmed number of rings.

When someone calls on lines monitored by CCR, the system answers the call and plays a user recorded greeting. Callers using a tone dial set can then:

- Enter an internal telephone number (a fast way for regular callers to reach someone directly),
- Direct their call by pressing a single digit as instructed by the user recorded greeting. For example: “To reach Sales please press 7”
- Reach an attendant by pressing zero,
- Access remote features.

Businesses can use two greetings with CCR: one for when their office is open and one for when it is closed. The business closed greeting may announce office hours and offer the caller the option of dialing an internal number to reach someone who is working after hours. If the business has an answering machine connected to the internal ATA of the Compact ICS, the caller may also be given the option of pressing a single digit to connect to the answering machine to leave a message.

CCR provides fast access for callers to a business without an attendant, or for a business that receives several calls to a particular person or group of persons - ideal for a business that has no dedicated person answering and routing calls.

Direct Extension Dialing

Both System Answer and CCR give the caller the opportunity to dial an internal telephone number or use remote feature access like direct inward system access (DISA). This means callers do not have to wait to reach the person they are calling and only the person they are calling has to handle the call.

The following table indicates the different scenarios that the Auto Attendant offers:

Compact ICS Status	Caller Will Hear	Then Caller Will Hear	Call Status
System Answer on Attendant busy on another call or away from desk	“Company Banner” User recorded, (5 seconds)	“All operators are busy. If you know the extension that you want and are using a touch tone phone, please dial it now or hold the line and your call will be answered as soon as possible.” (Pre-recorded greeting)	Caller then dials the desired extension or their call is automatically put on hold at the attendant set.
CCR on, Business Open	“Company Banner” User recorded, (5 seconds)	“ If you know the extension you want and are using a touch tone phone, please dial it now. Or, hold the line and your call will be answered as soon as possible.” (Pre-recorded greeting) “To reach one of our sales agents, press 1; for accounting, press 2; for John Smith, press 3; to repeat this menu press *”) (User recorded, 18 sec.)	Caller then dials the extension they want, directs call as per CCR menu, or their call is transferred to the attendant set where it will ring until answered.
CCR on, Business Closed	“Company Banner” User recorded, (5 seconds)	“Our offices are closed. Our business hours are 8 a.m. to 5 p.m. Monday through Friday Pacific Standard Time.” (User Recorded) “If you know the extension that you want and are using a touch tone phone, please dial it now.” (Pre-recorded greeting is repeated one time if caller does nothing) Thank you for calling” (Pre-recorded greeting)	Caller dials the extension they want or listens to the message one more time. If caller still does nothing the system automatically disconnects.

Compact ICS Software Cartridge Overview

The Compact ICS provides a high degree of customization to suit individual user needs and provides the enhanced, integrated features that small businesses are requesting.

Norstar Compact ICS Release 4.1 includes all Release 4.0, 2.0, 1.0 and DR5 features. In addition, features like full ISDN-BRI capability, provide a level of performance that is usually found only in much larger systems.

The software cartridge, an industry standard PCMCIA (Personal Computer Memory Card International Association), is used to run the system. It is approximately the size of a credit card and stores the system programming. The insertion slot on the core unit is cut away so the software load ID number can be read without removing the cartridge.

Five versions of the Compact ICS software cartridge are available:

- Compact ICS Release 4.1 Standard Software Feature Cartridge
 - Supports the use of both universal cartridge slots for a maximum of 8 CO trunks, or 16 ISDN-BRI digital lines, and up to 24 station ports.
- Compact ICS Release 4.1 Standard Software Feature Cartridge with Internal Remote Access Device (IRAD) Enabled
 - Offers the same as the Standard Software outlined above, but with IRAD enabled.
- Compact ICS Release 4.1 Standard Software Feature Cartridge with Internal Remote Access Device (IRAD) Enabled with Programmable Auto Attendant Prompts
 - Offers the same as the Standard Software outlined above, but with IRAD enabled and the ability to customize Auto Attendant prompts.
- Compact ICS Release 4.1 Restricted Software Feature Cartridge with Programmable Auto Attendant Prompts
 - Supports the use of one universal cartridge slot for a maximum of 4 CO trunks and 8 of the 16 potential station ports. To expand the system beyond 4x8, a Restricted to Standard Software Key Code upgrade must be purchased.
- Compact ICS Release 4.1 Restricted Software Feature Cartridge with Programmable Auto Attendant Prompts and Internal Remote Access Device (IRAD) Enabled
 - Offers the same as the Restricted Software outlined above, but with IRAD enabled.

With Release 4.1, businesses will no longer need to dedicate a line for fax calls. This increases the number of lines available for incoming and outgoing voice calls.

Norstar and ISDN

ISDN technology provides a fast, accurate and reliable means of sending and receiving data, images, text and voice information through a single pair of copper wires. The Norstar ICS platform provides Integrated Services Digital Network (ISDN) functionality to the small site business.

With end-to-end digital connectivity on all transmission circuits, ISDN offers significantly higher bandwidth and speed than analog transmission. Because they are digital, ISDN lines provide better quality signaling than analog Plain Old Telephone Service (POTS) lines; and ISDN out-of-band Data channel signaling offers faster call set up and tear down.

While an analog line only carries a single transmission at a time, an ISDN line can carry one or more voice, data, fax and video transmissions. For example, a user can connect to a remote computer and transfer a large data file while simultaneously making a voice call.

To transfer a 1MB data file, an analog modem operating at 14.4K takes about 4.5 minutes. A 28.8K modem cuts that transfer time in half. But by using just one channel of an ISDN line, transfer time is reduced to only 1 minute – and if two ISDN channels are used, transfer time for a 1MB file is slashed to just 30 seconds!

When transmitting data, connect time for an average ISDN call is about 3 seconds per call, compared with about 21 seconds for the average analog modem call.

ISDN supports access to existing public voice services, including POTS, Plain Old Long Distance Service, virtual voice networks, 800 lines and 900 lines. ISDN also supports access to existing public data services, including Switched 56 and X.25. And because ISDN lines use the same twisted-pair copper wires as analog lines, customers do not need to re-wire their premises to use ISDN.

ISDN supports a wide range of powerful business applications, such as file transfer, LAN to LAN connections, desktop sharing/white-boarding, video conferencing and video telephony, telecommuting, and more.

ISDN lines

ISDN lines are made up of separate channels that transmit information simultaneously:

- B (Bearer) channels with individual speeds of 64kbps, which can be used to carry a voice conversation, high-speed data flow or image;
- D (Data) channel for carrying control and signaling information and packet-switched data.

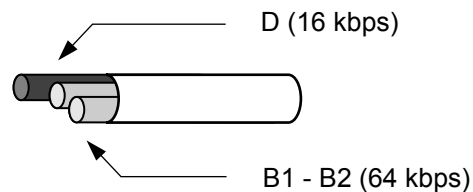
Because each ISDN line has more than one B-channel, a user can perform more than one transmission at the same time using a single ISDN line. Alternatively, B-channels may be bonded into a single high-speed data line, to provide more bandwidth on demand for rapid transmission or receipt of data files.

Two types of ISDN service are available: Basic Rate Interface (BRI) and Primary Rate Interface (PRI). Norstar Compact ICS and Modular ICS both support ISDN BRI and the Modular ICS supports ISDN PRI as well.

Basic Rate Interface (BRI)

ISDN BRI is known as “2B+D”, because it consists of three separate channels: two B-channels that can be used to carry a voice conversation, high-speed data flow or image; and one D-channel for carrying control and signaling information and packet-switched data, such as credit card verification.

ISDN Basic Rate Interface line - 2B + D

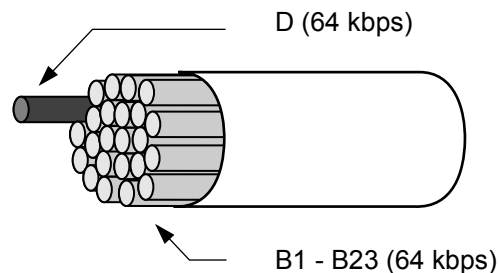


The two B-channels can replace two analog lines in many applications. As a result, many customers will be able to use a single BRI circuit, with a single access number, for all of their voice, fax and data transfer applications.

Primary Rate Interface (PRI)

ISDN PRI is known as “23B+D”, because it consists of 24 separate channels: 23 B-channels each of which can be used to carry a voice conversation, high-speed data flow or image; and a D-channel for carrying control and signaling information. The D-channel of a PRI line cannot carry packet data (such as credit card verification).

ISDN Primary Rate Interface line - 23B + D



PRI uses the same hardware platform as T1 on the Norstar Modular ICS.

National ISDN Standards

National ISDN is a set of standards, developed by manufacturers and operating companies, which enables ISDN services and equipment to be deployed in a multi-vendor environment. Equipment that is in agreement with 100% of the National ISDN Standard specifications is termed “compliant”, and equipment that works in accordance with National ISDN Standards is termed “compatible”. Norstar is **compatible** with the National ISDN Standards.

Ordering ISDN

Prior to the development of standardized Bellcore packages, ISDN services were ordered individually – a complicated and time-consuming process. Bellcore Capability Packages represent different configurations of ISDN services. In most instances, Norstar installations will use either Bellcore Capability Package “M” (voice and data) or “P” (voice, data and packet switching). In Canada, the familiar name for ISDN BRI is “Microlink” and for ISDN PRI the brand name is “Megalink.”

Although Bellcore Capability Packages have greatly simplified the process of ordering ISDN services, different telcos may offer different combinations of ISDN service in addition to or instead of the Bellcore packages.

Preparing for ISDN in your territory

Before promoting ISDN solutions to their customers, sales people must thoroughly research the following issues:

- Is ISDN service available?
- Is the available ISDN service compatible with the National Standards?
- Is ISDN a cost-effective solution?
- What ISDN user groups or forums exist?
- What is the telco’s time frame for ordering Bellcore packages supported by Norstar Compact and Modular ICS?

ISDN Applications

Industry trends indicate that the data needs of end users are becoming more sophisticated. Data applications are not only crucial for day-to-day operations but also require more bandwidth than ever before. ISDN Basic Rate Interface (BRI) and Primary Rate Interface (PRI) for Norstar addresses this growing demand and replaces today’s analog modem technology with digital transmission speeds up to 128 kbps.

Compact ICS 4.1 BRI and Modular ICS 4.1 BRI and PRI offer flexible, scalable solutions for customers who need high-speed information access or transfer. This includes small businesses who:

- Have employees who telecommute and need access to company databases, networks or e-mail,
- Have employees who frequently travel to attend meetings,
- Collaborate with geographically dispersed people,
- Use multiple analog lines for telephone, fax and modem,
- Send and receive large data files, images, video, or sound files,
- Depend on voice communications via the telephone for conducting their business,
- Make regular dial-up connections to the Internet or other computer services.

Voice Over ISDN

Approximately half of the ISDN lines installed today are at least partially used for basic voice communications (IDC/Link, 1997).

The faster call set up and tear down capability of ISDN can provide significant benefits to businesses, particularly in call center applications. In addition, ISDN network services provide a number of features that can enhance the usefulness of the Norstar system. These include such features as Calling Name & Number Delivery (Caller ID).

Values and benefits:

- Faster call setup and tear down of calls,
- CLID delivery lets you know who is calling before you answer. CLID delivery can also enhance CTI applications,
- ISDN offers enhanced reliability and clarity.

LAN Access

LAN connectivity, including access to a remote LAN, is one of the primary data applications driving the ISDN market. This application is particularly important to small businesses with lower volume LAN requirements. The dial-up nature of a BRI or PRI connection means the user only pays for actual transmission times rather than the expense of having a dedicated digital circuit.

The Norstar ICS brings digital connectivity to the desktop and allows employees high-speed access to remote LANs as needed. This application facilitates access to centralized database information, business-wide on-line applications and file transfers for operations management.

Values and benefits:

- Reduces costs - eliminates need for dedicated data lines because the Computer Telephony Adapter uses the station loop of the Norstar telephone it is paired with,
- Reduces costs - improves transmission time for large file transfers such as images, graphics, and x-rays,
- Reduces costs - saves on the cost of inter-office couriers and employee travel time,
- Improves employee productivity - employees no longer have to wait on couriers, analog modems, or other slower forms of communication to obtain the information they need,
- Improves employee efficiency - easy access to records and resources.

Internet Access

Anyone who has spent any time surfing the Internet knows how frustrating it can be to wait for graphics-intensive Web sites to download. The large files used to deliver graphics, sound, animation and video on the World Wide Web are making analog modems obsolete.

Business users are looking for an affordable way to increase interaction speed and reduce download time. ISDN provides them with an immediate solution.

The Instant Internet 100 and 400 address all levels of Internet access requirements. The Instant Internet 100, supporting ISDN and analog connectivity, targets the low-bandwidth customer.

The Instant Internet 400, supporting ISDN, analog, T1 and V.35 (via the Norstar Data Interface) connectivity, targets the customer with higher bandwidth requirements. The Norstar Data Interface does not support ISDN.

Values and benefits:

- Improves employee productivity - less time spent waiting for pages to load;
- Reduces costs - faster transmission speeds;
- Increase revenues - E-commerce.

Telecommuting

Telecommuting is an exploding business phenomenon across North America. Teleworkers include part-time home workers, full-time telecommuters and employees working from home after hours. These workers require access to corporate LANs for applications, databases and e-mail. In addition, they may make use of Internet access and desktop video conferencing.

Values and benefits:

- Increases employee productivity - less time spent commuting;
- Increases employee satisfaction - better balance between work and home responsibilities, lower stress;
- Reduces workplace costs - less office space required, reduced turnover and hiring expenses.

Video conferencing

While video applications presently account for only a very small percentage of ISDN lines, ISDN is becoming the connection of choice for a growing number of video and screen share applications used for local, transcontinental and international meetings.

Values and benefits:

- Reduces travel time and expenses,
- Increases employee productivity - less time in cars and on planes,
- Reduces costs - dedicated video conferencing lines no longer required,
- Improves communications.

ISDN Network Services and Features

Compact ICS Release 4.1 and Modular ICS Release 4.1 support a variety of ISDN network features. These features are dependent on the type of Central Office facility serving the customers location, as well as the service provider's network feature offering.

In many cases, the ISDN features provided by the network have been designed with a single connection in mind (for example, to a residence). That's why the use of these features in a line-concentrated key system should be clearly understood by the customer to avoid unexpected results.

ISDN network feature	Description
Network Call Forward	Allows the customer to forward all incoming calls on a line to an external number. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature. Once this feature has been invoked, the line will be available for outgoing calls only on the Norstar system.
Network Auto Dial	Allows a customer to automatically redial the last incoming number whether or not the call was answered. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Automatic Call Back	Allows a caller, who has been unable to reach a busy subscriber, to be notified when the subscriber goes on-hook. When the called line becomes idle, the calling line will ring. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature. If another user selects the line and is on a call when the call back event occurs, the call back function will be dropped for the line and the customer will not receive another call back notification.
Calling Name & Number Delivery	Provides the name and number of the calling party on the display of any of the Norstar telephones. This network capability comes with nearly all BRI services at no additional charge. Calling name and number delivery on ISDN is received immediately by the customer, unlike analog calling line identification, which is provided between the first and second rings of the telephone. All the features and benefits currently available on Norstar for CLID will be supported on Calling Name and Number Delivery.
Calling Name & Number Delivery Blocking	Allows the customer to block the transfer of their name and number to the called party on a call-by-call basis.
Customer Originated Trace	Allows the recipient of obscene or harassing calls to request a trace of the last call received by their service provider. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Unidentified Call Rejection	Allows the customer to reject incoming calls from parties who have a privacy feature that prevents the delivery of the calling number. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Network Speed Dial	Allows the customer to store frequently called numbers for speed dialing. This feature is specific to a line and the customer must select the appropriate line key prior to invoking the feature.
Multi-Line Hunt Groups	Allows calls made on the customer's prime DN to hunt to the next available line or BRI circuit if the prime DN is busy.

CMS/CLASS Features

CMS/CLASS is a unique set of features and protocols. One of the prime features is the delivery of call-related information from a Central Office switch to a customer's premise. This information is delivered between the first and second ring. If the call is answered prior to delivery, the data is permanently lost.

One of the most popular CMS/CLASS features is Name and/or Number Delivery. Besides the obvious benefit of knowing who is calling before you pick up the phone, there are some significant marketing and sales benefits that can be derived from this information.

These Norstar features are available when CMS/CLASS is supplied on your telephone line and the Norstar system is equipped with DR5 or newer software plus appropriate hardware:

- Call Information Feature,
- Calling Name and/or Number Display,
- LOGIT Feature (Manual Logging),
- Long Distance Indicator,
- Caller Log
 - Auto Bump On/Off,
 - Automatic Redial,
 - Caller Name/Number,
 - Logging Options,
 - Long Distance Indicator,
 - Optional Password Protection,
 - Repeat Call Counter,
 - Automatic Redial
- CO-based voice mail visual message notification.

The following CO-based CMS/CLASS features also interact with Norstar to enhance Norstar's operation. Please note that feature names and availability will vary from region to region.

- Automatic Callback (AC),
- Automatic Recall (AR),
- Calling Number Delivery Blocking,
- Customer Originated Trace,
- Distinctive Ringing/Call Waiting,
- Selective Call Acceptance.

Norstar ICS Software Features

Norstar ICS Features	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1.1	MICS R1T1 & CTX	MICS 1.0 (USA XL, USA XC, CDA XC)	MICS 1.1 (NA, USA XC, CDA XC)	MICS 2.0 (NA, USA XC, CDA XC)	MICS 3.0 (NA, USA XC, CDA XC)	MICS 4.0 (NA, USA XC, CDA XC)	MICS 4.1 (NA, USA XC, CDA XC)	MICS 4.1.1 (NA, USA XC, CDA XC)
Access control to Link, LNR, SNR		√	√	√	√				√	√	√	√	√
Accidental Disconnect	√	√	√	√	√	√	√	√	√	√	√	√	√
Administration & Configuration tree (new programming structure)	√	√	√	√	√				√	√	√	√	√
Analog Station Module Recognition								√	√	√	√	√	√
Answer Groups/Keys	√	√	√	√	√	√	√	√	√	√	√	√	√
Autodial Keys	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24
• Store Facility Access	√	√	√	√	√	√	√	√	√	√	√	√	√
• Store Reach Through Codes	√	√	√	√	√	√	√	√	√	√	√	√	√
Automated Attendant	√	√	√	√	√								
• Custom Call Routing	√	√	√	√	√								
• System Answer	√	√	√	√	√								
Automatic Daylight Savings Time	√	√	√	√	√			√	√	√	√	√	√
Automatic Line Selection	√	√	√	√	√	√	√	√	√	√	√	√	√
Automatic Set Relocation	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmable On / Off	√	√	√	√	√	√	√	√	√	√	√	√	√
Auxiliary ringing	√	√	√	√	√	√	√	√	√	√	√	√	√
• For lines in service modes	√	√	√	√	√	√	√	√	√	√	√	√	√
Background Music	√	√	√	√	√	√	√	√	√	√	√	√	√
Busy Lamp Indication	√	√	√	√	√	√	√	√	√	√	√	√	√
• On line pool key	√	√	√	√	√	√	√	√	√	√	√	√	√
Button Inquiry	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Display when busy	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Features	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1.1	MICS R1T1 & CTX	MICS 1.0 (USA XL, USA XC, CDA XC)	MICS 1.1 (NA, USA XC, CDA XC)	MICS 2.0 (NA, USA XC, CDA XC)	MICS 3.0 (NA, USA XC, CDA XC)	MICS 4.0 (NA, USA XC, CDA XC)	MICS 4.1 (NA, USA XC, CDA XC)	MICS 4.1.1 (NA, USA XC, CDA XC)
Call Duration timer	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Forward	√	√	√	√	√	√	√	√	√	√	√	√	√
• All calls	√	√	√	√	√	√	√	√	√	√	√	√	√
• Call Forward Busy	√	√	√	√	√	√	√	√	√	√	√	√	√
• No Answer	√	√	√	√	√	√	√	√	√	√	√	√	√
• Override	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Identification	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Park	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Call Park codes	9	9	9	9	9	9	9	25	25	25	25	25	25
• Round robin code assignment		√	√	√	√			√	√	√	√	√	√
• Time outs (30-600 sec.)	√	√	√	√	√	√	√	√	√	√	√	√	√
• With Callback	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Pickup	√	√	√	√	√	√	√	√	√	√	√	√	√
• Directed	√	√	√	√	√	√	√	√	√	√	√	√	√
• Pickup Groups (4 groups in Compact ICS, 9 groups in Modular ICS)	√	√	√	√	√	√	√	√	√	√	√	√	√
• Trunk Answer From Any Station	√	√	√	√	√	√	√	√	√	√	√	√	√
Call Queuing	√	√	√	√	√	√	√	√	√	√	√	√	√
Camp On	√	√	√	√	√	√	√	√	√	√	√	√	√
Central Answering Position	√	√	√	√	√	√	√	√	√	√	√	√	√
• CAP feature & autodial only	√	√	√	√	√	√	√	√	√	√	√	√	√
• BLF indication	√	√	√	√	√	√	√	√	√	√	√	√	√
Class of Service	√	√	√	√	√	√	√	√	√	√	√	√	√
• COS Passwords	19	19	19	19	19	100	100	100	100	100	100	100	100
• Dialing Abilities	√	√	√	√	√	√	√	√	√	√	√	√	√
CMS/CLASS													
• Call Information Session	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Features	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1.1	MICS R1T1 & CTX	MICS 1.0 (USA XL, USA XC, CDA XC)	MICS 1.1 (NA, USA XC, CDA XC)	MICS 2.0 (NA, USA XC, CDA XC)	MICS 3.0 (NA, USA XC, CDA XC)	MICS 4.0 (NA, USA XC, CDA XC)	MICS 4.1 (NA, USA XC, CDA XC)	MICS 4.1.1 (NA, USA XC, CDA XC)
• Caller Log	80	80	80	80	80	600	600	300	600	600	600	600	600
• Calling Name Display	√	√	√	√	√	√	√	√	√	√	√	√	√
• Calling Number Display	√	√		√	√	√	√	√	√	√	√	√	√
• LOGIT Feature	√	√	√	√	√	√	√	√	√	√	√	√	√
• Long Distance Indicator	√	√	√	√	√	√	√	√	√	√	√	√	√
Conference	√	√	√	√	√	√	√	√	√	√	√	√	√
• Independently hold two calls	√	√	√	√	√	√	√	√	√	√	√	√	√
• Using Privacy	√	√	√	√	√	√	√	√	√	√	√	√	√
Delayed Ring Transfer	√	√	√	√	√	√	√	√	√	√	√	√	√
• To prime	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmable # of rings	√	√	√	√	√	√	√	√	√	√	√	√	√
Dial Attendant Set	√	√	√	√	√	√	√	√	√	√	√	√	√
• Direct Dial Digit	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9	0-9
Dialing Modes	√	√	√	√	√	√	√	√	√	√	√	√	√
• Standard	√	√	√	√	√	√	√	√	√	√	√	√	√
• Automatic	√	√	√	√	√	√	√	√	√	√	√	√	√
• Predial	√	√	√	√	√	√	√	√	√	√	√	√	√
Dial Mode for Lines - pulse/tone	√	√	√	√	√	√	√	√	√	√	√	√	√
Direct Station Select Buttons	√	√	√	√	√	√	√	√	√	√	√	√	√
Disconnect Supervision	√	√	√	√	√	√	√	√	√	√	√	√	√
Discriminating Ringing at Set	√	√	√	√	√	√	√	√	√	√	√	√	√
Do Not Disturb	√	√	√	√	√	√	√	√	√	√	√	√	√
• DND On Busy	√	√	√	√	√	√	√	√	√	√	√	√	√
End-to-End Signaling	√	√	√	√	√	√	√	√	√	√	√	√	√
Enhanced Call Restrictions and Overrides	√	√	√	√	√	√	√	√	√	√	√	√	√
• Dialing Filers (max)	25	25	25	25	25	100	100	100	100	100	100	100	100
• Alternate toll restrictions	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar ICS Features	CICS 1.0	CICS 2.0	CICS 4.0	CICS 4.1	CICS 4.1.1	MICS R1T1 & CTX	MICS 1.0 (USA XL, USA XC, CDA XC)	MICS 1.1 (NA, USA XC, CDA XC)	MICS 2.0 (NA, USA XC, CDA XC)	MICS 3.0 (NA, USA XC, CDA XC)	MICS 4.0 (NA, USA XC, CDA XC)	MICS 4.1 (NA, USA XC, CDA XC)	MICS 4.1.1 (NA, USA XC, CDA XC)
• System Speed Dial overrides	√	√	√	√	√	√	√	√	√	√	√	√	√
External Call Forward				√	√							√	√
External Line Access Code	√	√	√	√	√	√	√	√	√	√	√	√	√
Fax Switch				√	√								
Flexible Numbering Plan	√	√	√	√	√	√	√	√	√	√	√	√	√
• Changing DN length	√	√	√	√	√	√	√	√	√	√	√	√	√
Group Listening	√	√	√	√	√	√	√	√	√	√	√	√	√
Handsfree	√	√	√	√	√	√	√	√	√	√	√	√	√
• Automatic	√	√	√	√	√	√	√	√	√	√	√	√	√
Hold	√	√	√	√	√	√	√	√	√	√	√	√	√
• Held Line Reminder	√	√	√	√	√	√	√	√	√	√	√	√	√
Hospitality				√	√							√	√
• Alarm				√	√							√	√
• Room Condition				√	√							√	√
• Room Occupancy				√	√							√	√
Host Delay	√	√	√	√	√	√	√	√	√	√	√	√	√
Host System Signaling	√	√	√	√	√	√	√	√	√	√	√	√	√
• Feature code compression	√	√	√	√	√	√	√	√	√	√	√	√	√
• Pause, run/stop, timed release	√	√	√	√	√	√	√	√	√	√	√	√	√
• Programmed release	√	√	√	√	√	√	√	√	√	√	√	√	√
• Recall / Link	√	√	√	√	√	√	√	√	√	√	√	√	√
Hot Line	√	√	√	√	√	√	√	√	√	√	√	√	√
Hunt Groups			√	√	√						√	√	√
• Max. number of groups			6	6	6						24	24	24
• Members per group			24	24	24						40	40	40
• Selectable Modes			√	√	√						√	√	√
• Busy Options			√	√	√						√	√	√

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IDM Support										√	√	√	√
Incoming Line Groups	√	√				√	√	√	√	√			
Installer Password	√	√	√	√	√	√	√	√	√	√	√	√	√
Intercom Key Assignment	√	√	√	√	√	√	√	√	√	√	√	√	√
ISDN-BRI features		√	√	√	√				√	√	√	√	√
• Basic Call Trunking		√	√	√	√				√	√	√	√	√
• Calling Name ID			√	√	√						√	√	√
• Calling Number ID (incoming calls only)		√	√	√	√				√	√	√	√	√
• Sub-addressing		√	√	√	√				√	√	√	√	√
ISDN-PRI features											√	√	√
• Basic Call Trunking											√	√	√
• Calling Name ID											√	√	√
• Calling Number ID											√	√	√
• Call by Call Service Selection											√	√	√
• E911											√	√	√
• Fractional PRI											√	√	√
Language Choice	√	√	√	√	√	√	√	√	√	√	√	√	√
Last Number Redial	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24
Line Button Relocation	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Names	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Pool(s)	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Redirection	√	√	√	√	√	√	√	√	√	√	√	√	√
Line Types (Pool, Public, Private)	√	√	√	√	√	√	√	√	√	√	√	√	√
Link/Flash (Recall)	√	√	√	√	√	√	√	√	√	√	√	√	√
Listen On Hold	√	√	√	√	√	√	√	√	√	√	√	√	√
Long Tones	√	√	√	√	√	√	√	√	√	√	√	√	√

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Loss Plan	√	√	√	√	√	√	√	√	√	√	√	√	√
Messages (Send, Waiting, Reply)	√	√	√	√	√	√	√	√	√	√	√	√	√
• Static Time & Date		√	√	√	√				√	√	√	√	√
Message Waiting Lamp (BSTs)					√								√
Multiple Line Appearances	√	√	√	√	√	√	√	√	√	√	√	√	√
Music/Tone/Silence On Hold	√	√	√	√	√	√	√	√	√	√	√	√	√
Networking - Norstar to Meridian 1											√	√	√
• Centralized PSTN											√	√	√
• CDP											√	√	√
• Name and Number ID											√	√	√
Night Service	√	√	√	√	√	√	√	√	√	√	√	√	√
• Flexible	√	√	√	√	√	√	√	√	√	√	√	√	√
• Service Modes	√	√	√	√	√	√	√	√	√	√	√	√	√
Onhook Dialing	√	√	√	√	√	√	√	√	√	√	√	√	√
Outgoing Name & Number Blocking				√	√							√	√
Paging	√	√	√	√	√	√	√	√	√	√	√	√	√
• Internal (Multiple Zones)	√	√	√	√	√	√	√	√	√	√	√	√	√
• Page Yes/No Per Set	√	√	√	√	√	√	√	√	√	√	√	√	√
• Page time-out		√	√	√	√			√	√	√	√	√	√
• Page tone on/off		√	√	√	√			√	√	√	√	√	√
Password Protection	√	√	√	√	√	√	√	√	√	√	√	√	√
Preselection/Call Screening	√	√	√	√	√	√	√	√	√	√	√	√	√
Prime Line Select	√	√	√	√	√	√	√	√	√	√	√	√	√
Prime Set(s)	√	√	√	√	√	√	√	√	√	√	√	√	√
• Multiple prime sets	√	√	√	√	√	√	√	√	√	√	√	√	√
Priority Call	√	√	√	√	√	√	√	√	√	√	√	√	√

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Privacy	√	√	√	√	√	√	√	√	√	√	√	√	√
• On/Off	√	√	√	√	√	√	√	√	√	√	√	√	√
• Per Line	√	√	√	√	√	√	√	√	√	√	√	√	√
Ringling Line Preference	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote System Access	√	√	√	√	√	√	√	√	√	√	√	√	√
Receiver Volume	√	√	√	√	√	√	√	√	√	√	√	√	√
Receive Tones	√	√	√	√	√	√	√	√	√	√	√	√	√
Restriction Override Password(s)	√	√	√	√	√	√	√	√	√	√	√	√	√
Ring Again (Internal)	√	√	√	√	√	√	√	√	√	√	√	√	√
• On busy line pool	√	√	√	√	√	√	√	√	√	√	√	√	√
Routing Service/Dest. Codes	√	√	√	√	√	√	√	√	√	√	√	√	√
Saved Number Redial	√	√	√	√	√	√	√	√	√	√	√	√	√
Service Modes	√	√	√	√	√	√	√	√	√	√	√	√	√
Speed Dial: Personal	√	√	√	√	√	√	√	√	√	√	√	√	√
• All sets supported	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24
Speed Dial: System	√	√	√	√	√	√	√	√	√	√	√	√	√
• Number of Entries	70	70	70	70	70	70	70	70	70	70	70	70	70
• Number of Digits	24	24	24	24	24	24	24	24	24	24	24	24	24
• Name Support	√	√	√	√	√	√	√	√	√	√	√	√	√
Station Set Test	√	√	√	√	√				√	√	√	√	√
System Version	√	√	√	√	√	√	√	√	√	√	√	√	√
Telephone Admin Lock	√	√	√	√	√	√	√	√	√	√	√	√	√
Time /Date Display	√	√	√	√	√	√	√	√	√	√	√	√	√
Transfer	√	√	√	√	√	√	√	√	√	√	√	√	√
• Immediate	√	√	√	√	√	√	√	√	√	√	√	√	√
• With announcement	√	√	√	√	√	√	√	√	√	√	√	√	√
• With Callback	√	√	√	√	√	√	√	√	√	√	√	√	√

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	• Over Public Network	√	√	√	√	√	√	√	√	√	√	√	√
Unsupervised Conference	√	√	√	√	√	√	√	√	√	√	√	√	√
User programmable feature keys	√	√	√	√	√	√	√	√	√	√	√	√	√
Voice Call	√	√	√	√	√	√	√	√	√	√	√	√	√
Voice Call Deny	√	√	√	√	√	√	√	√	√	√	√	√	√

Norstar 3X8 Software Features

Norstar 3x8 Features	DR1	DR5
Accidental Disconnect	√	√
Answer Buttons		√
Autodial Keys	√	√
• Number of Digits	16	24
• Store Facility Access		√
• Store Reach Through Codes		√
Automatic Line Selection	√	√
Automatic Set Relocation	√	√
• Programmable on / off		√
Auxiliary Ringing	√	√
• For lines in Service Modes	Night Service	√
Background Music	√	√
Busy Lamp Indication	√	√
• On M7324 DSS keys		√
• On line pool key		√
Button Inquiry	√	√
• Examine speed dial numbers		√
Call Display When Busy	√	√
Call Duration Timer	√	√
Call Forward	√	√
• All Calls	√	√
• Call Forward Busy		√
• Forward No Answer Delay		√
• No Answer		√
• Override	√	√
Call Identification (Internal Calls)	√	√
Call Park		√
• Prefix Digit		0-9
• Time Outs (30 - 600 sec.)		√
• With Callback		√
Call Pickup	√	√
• Directed		√
• Pickup Groups (4 groups)	√	√
• Trunk Answer from Any Station	√	√
Call Queuing		√

Norstar 3x8 Features	DR1	DR5
Camp On		√
Central Answering Position		√
• (CAP features & autodial only)		
Class of Service		√
• COS Passwords		20
• Dialing abilities		√
CMS/CLASS		√
• Call Information Session		80 calls
• Caller Log		80 calls
• Calling Name Display		√
• Calling Number Display		√
• CO VMail Message Waiting Indicator		√
• LOGIT Feature		√
• Long Distance Indicator		√
Conference	√	√
• Independently hold two calls		√
• Unsupervised		√
• Using Privacy		√
Custom Business Products Compatibility		√
Delayed Ring Transfer	√	√
• To Prime	√	√
• After programmable number of rings		√
Dial "X" Set (Direct Dial Set)		√
• Direct Dial Digit	0 only	0-9
• Destination Set	Extn. 21 only	Flexible
Dialing Modes	√	√
• Standard	√	√
• Automatic		√
• Predial		√
Dial Mode for Lines - pulse/tone	√	√
Dial Pad Feedback	√	√
Direct Station Select Buttons	√	√
Disconnect Supervision		√
Discriminating Ringing at Set	√	√
Distinctive Ringing Cadence	√	√
Do Not Disturb	√	√

Norstar 3x8 Features	DR1	DR5
End -to-End Signaling	√	√
• Long tones - External		√
• Long tones - Internal		√
• Long tones - On Ext. paging port		√
External Line Access	√	√
Flexible Call Restrictions (on a per line basis)	Uses Tables	Filters
• Dialing Filters (max)		25
• Filter Restrictions per System (max)		200
• No. of digits per restriction	10	15
• No. of digits per exception/override	14	16
• Restrictions per filter (max)		48
Group Listening		√
Handsfree	√	√
• Answerback	√	√
• Automatic		√
• With Mute Capability	√	√
Hold	√	√
• Automatic	√	√
• Exclusive	√	√
• Held Line Reminder	√	√
• Reminder Delay Range (seconds)	30-120	30-180
• I-Hold/U-Hold/Mutual Hold	√	√
• Listen on Hold	√	√
Host Delay		√
Host System Signaling (Called Centrex/PBX features on DR1)	√	√
• Feature code compression		√
• Pause, run/stop, timed release	√	√
• Programmed release		√
• Recall / Link	√	√
Hot Line - External, Internal & none		√
Installer Password		√
Intercom Key Assignment	√	√
Language Choice	√	√
Last Number Redial	√	√
• Number of Digits	16	24
• Selects facilities used on original call		√
• Convert to auto/speed dial		√
Line Button Relocation		√
Line Name		√

Norstar 3x8 Features	DR1	DR5
Line Pool	√	√
• Number of Pools	1	3
• Ring Again on Busy Pool		√
• Pool Access Code	9	√
Line Selection	√	√
• Manual	√	√
• Preselection		√
Line Types (Pool, Public, Private)	√	√
Line Redirection		√
• Allow/deny per set, redirecting burst		√
Link	√	√
Listen On Hold	√	√
Long Tones		√
Loss Plan	√	√
Messages (Send, Waiting, Reply)	√	√
Multiple Line Appearances	√	√
Music/Tone/Silence On Hold	√	√
Onhook Dialing	√	√
• Using special features (for example, last number redial)	√	√
Paging	√	√
• On/Off on a per set basis		√
• Internal zones		3
• External speaker	√	√
• Long tones on paging port		√
• Receive page Y or N per set	√	Zones
Preselection/Call Screening	√	√
Prime Line Select	√	√
Prime Set	√	√
• Call forward to prime set		√
• Call back to prime	√	√
• Delayed ring transfer (DTR) to prime	√	√
• Number of Rings until DRT	3	1,2,3,4,6 or 10
Priority Call - per set, on /off option		√
Privacy	√	√
• On Lines	√	√
• Control		√
Receive Tones Y/N (ATA tone pass through)		√
Release	√	√

Norstar 3x8 Features	DR1	DR5
Ring Again (Internal)	√	√
• On Busy	√	√
• On Busy Line Pool		√
• On No Answer		√
Ringing Line Preference	√	√
Saved Number Redial		√
• 24 digit & previous line		√
Service Modes		√
Set Names	√	√
Speed Dial: Personal	√	√
• Number of Digits	16	24
• Restriction Override Capability		√
• Name Support		√
• Display Digits Y/N		√
• Line Selection		√
Speed Dial: System	√	√
• Number of entries	30	70
• Number of Digits	16	24
• Name Support		√
• Restriction Override Capability		√
• Display Digits Y/N		√
• Line Selection		√
System Version		√
Telephone Admin Lock		√
Time/Date Display	√	√
• Show time temporarily during call		√
Transfer	√	√
• Number of rings for callback		3,4,5,6 or 12
• Over Public Network		√
• Unified; Immediate & with announce		√
• Using Conference	√	√
• Using Hold	√	√
• With Callback		√
Unsupervised Conference		√
User programmable feature keys	√	√
Voice Call	√	√
Voice Call Deny	√	√

Norstar Software Features and Benefits

This section describes Norstar software features and some of the possible benefits customers can realize. Check the software feature chart to determine what features are available on the various system software options.

Note: * denotes the described feature is a CMS/CLASS line feature and not a Norstar feature

Access Control to Link, LNR, SNR

System security enhancement that allows system administrator the option to remove access to Link, LNR and/or SNR on a set-by-set basis.

Prevents toll fraud by forcing set to adhere to Norstar call restrictions.

Accidental Disconnect Protection

If the receiver is accidentally dropped back into the cradle when answering a call, it can be retrieved within one second.

Prevents calls from being lost and thereby provides more professional call handling.

Alternate Restrictions

Alters which calls can be made by changing dialing restrictions according to both time of day and day of week.

Helps to control unauthorized calling.

Answer Groups (also called Answer Button or Answer DN)

A telephone button with an indicator that is used to monitor ringing calls at another set. Calls are answered at the monitoring set by pressing the active button.

Allows a person to monitor or answer all calls at another phone by simply pressing one button.

Auto-Answer

Used with DID, DISA, and E&M trunks, calls are automatically answered by the Norstar system bypassing the attendant; a caller

enters the digits for routing to a specific set or line pool access.

Improves customer service by offering more efficient incoming call handling.

Auto Bump On/Off

Feature 8 1 5 (On)

Feature # 8 1 5 (Off)

When a Call Log becomes full, Auto Bumping – “On”, will cause the oldest entry previously viewed to be deleted, and the new call to be logged; when “Off”, the Norstar system will not log new calls.

Automated log management if desired.

Autodial (Internal and External)

Feature * 1 (External)

Feature * 2 (Internal)

Internal or external numbers can be programmed onto memory buttons for one-button dialing access.

Saves time by providing direct access to another person in or outside the office with no need to remember the number.

Automatic Number Identification (ANI)

Delivers the calling line number. (T1 Specific)

Improves customer service when used to pull customer info from a data base before speaking with customer.

Automatic Route Selection (ARS)

Automatically selects the pre-programmed long-distance carrier based on the dialed digits, time of day and day of week.

Lowers costs by insuring that the cheapest available long distance routes are being used.

Automatic Callback (AC) *

Automatically redials the last outgoing number dialed. If it's busy, the CO will use "Ring Again" to monitor the line. When it is free, the caller will hear special ringing, and the number and/or name of the called party will be delivered to the LCD. Multiple busy lines can be monitored for up to 30 minutes. This feature can be programmed as an external autodial for one button convenience.

Improves productivity as the caller, while waiting, can work or continue to use the telephone. With Norstar, the special ring is easy to hear, and callers are quickly identified with call display.

Automatic Daylight Savings Time

The system clock automatically falls back one hour on the last Sunday of October at 2:00 am and automatically advances one hour on the first Sunday of April at 2:00 am. This feature can be de-activated where not applicable.

The user no longer has to remember to take care of this. Eliminates the next business day confusion about what time it is and how to program the change.

Automatic Line Selection

When answering incoming ringing calls, Norstar automatically selects the longest ringing line first. Ringing incoming calls are automatically connected by lifting the receiver, pressing Handsfree, or using Call Queuing.

A user does not need to know which line is ringing or which call has been ringing the longest.

Automatic Recall (AR) *

This feature works the same as Automatic Callback (AC). Applies to the last incoming call received.

Automatic Set Relocation

Sets moved to a different location will retain all custom programming.

Saves time and money during employee moves. Employees are able to keep the same extension number.

Auxiliary Ringing

A set's headset jack can send ringing tones via an amplifier to an external loud ringer connected to the set.

Users can hear a ringing set in a noisy environment.

Background Music

Feature

A user can listen to music (customer supplied) through the set's speaker when the set is idle.

If supplied, it delivers music to a user's set to enhance their work environment.

Button (Key) Inquiry

Feature

Allows a user to check the programming on memory buttons.

Ensures current programming matches the button labeling.

Call Duration Timer

Feature

Temporarily displays the length of the last or current call so a user can record it.

Users can track time spent on calls; useful for account billing.

Call Forward All Calls

Feature

Sends all calls to another set.

Improves customer service by ensuring all calls are answered.

Call Forward No Answer

After a preset number of rings, an unanswered call is transferred to another DN.

Ensures a user's phone is answered if the user is unable to answer a call or has forgotten to activate Call Forward.

Call Forward On Busy

If a set is busy, calls are immediately sent to another DN.

When a set is busy, the user is not disturbed and incoming calls are routed promptly.

Call Forward Override

When a set is on Call Forward, the "Forward To" set can still call the "Forwarded" set to relay important messages.

Improves office communications; users can inform others of important messages or ask for forwarding to be cancelled.

Call Forward – Selective

Feature 8 5

Pressing the "Do Not Disturb" button when a Central Office line is ringing will transfer the call to the Prime set.

Improves time management for the user, who can view the caller name and then choose to accept or reject it.

Call Information

Feature 8 1 1

Allows you to display information about incoming calls. For external calls, CMS is required and you can display the caller's name, telephone number and the line name. For internal calls, you can display the name and the internal number.

You can obtain information about ringing, answering, or held calls.

Call Log

Feature 8 1 2

Allows the user to enter Call Log to view stored information including: Caller's name and/or number (if delivered from the CO),

Date and Time, Answered Call Indication and Repeat Call Counter.

Increases business opportunities and improves customer service by capturing callers number and/or name even if the call goes unanswered. It also improves productivity by allowing a user to redial the caller phone number.

Call Log - Optional Password

The user can enable password protection of their call log.

Provides the user with security for their call log.

Calling Name & Number Display

The user can view the name and number of the incoming caller before answering and during the call. The calling number is also stored in the Call Log. (Requires CMS/CLASS, ISDN-BRI or ISDN-PRI.)

Knowing who is calling improves a user's ability to serve the customer. In conjunction with Call Log, knowing who called increases business opportunities. The caller's number can be passed to an associated PC application to improve customer service, for example, by triggering automatic customer profile retrieval.

Calling Name & Number Display Blocking

Feature 8 1 9

Delivery of calling name and/or number can be prevented when a user places a call. For outgoing calls, Norstar supports one button convenience when the user wishes to "block" their number and/or name. (Requires CMS/CLASS, ISDN-BRI or ISDN-PRI.) On incoming calls, the Norstar user will be presented with "Private Name" and/or "Private Number" when receiving a "blocked" call.

Privacy and security are maintained for outgoing calls. Identifies callers who have blocked their number and/or name for inbound calls.

Call Park - Linear / Round Robin

System administrator has the option of choosing linear or round robin call park codes. With linear codes, the system assigns the first free call park code to the call. This means that the first few call park codes will be used most frequently. In busy environments this can cause confusion when calls have been hung up or callback and within moments a new call is parked using the same code. Round robin call park codes are assigned sequentially until the maximum number of codes is reached (25) before starting again at the first code.

Provides system configuration flexibility and customization to customer needs.

Call Park (With Callback)

Feature 7 4

An active call can automatically be placed on hold and assigned a code so it can be retrieved from another set.

More convenient and efficient, parked calls can be retrieved from any Norstar set in the system.

Call Pickup Directed

Feature 7 6 + Intercom #

By dialing the ringing set's intercom number, a ringing call at any other set can be answered.

Simple and convenient to answer calls ringing at another set. The user will know whose set they are answering.

Call Pickup Group

Feature 7 5

Users can answer any call ringing at another set within the pickup group.

Lets users within a defined group provide more efficient call coverage for incoming calls ringing at another set within the group.

Call Pickup Trunk Answer From Any Station

Feature 8 0 0

Allows a ringing external call to be answered at any other set.

Improves after-hours communications, as calls can be heard and answered from any station.

Call Queuing

Feature 8 0 1

It answers the next available call, but gives priority to the longest waiting external call.

Improves customer service, because calls are answered promptly and efficiently. (Used with DR3 and higher.)

Call Waiting

Feature 8 0 1

The next available call is answered, but gives priority to the longest waiting external call.

Same benefits as Call Queuing. (Used only with Centrex, Centrex+, and R1/Centrex software.)

Callback

Unanswered parked or transferred calls automatically return to the originating set after a preset number of seconds.

Customer service is improved as all calls will be answered.

Camp On (Call Waiting)

An external call waits at a busy set, making alerting tones, until answered or Callback returns it to the originating set.

Allows more calls than a set has lines to wait at a set; alerting tones or illuminated LCD notify the user of a waiting call.

Central Answering Position (CAP)

(Also known as a Key Lamp Module) A CAP module connected to an M7324 set may be assigned enhanced CAP status. This allows lines assigned to this DN to be moved to the CAP module. The Compact ICS supports one enhanced CAP position and the Modular

ICS supports up to five enhanced CAP positions.

Class of Service (COS)

Class of Service controls the Norstar features and lines available when a call is placed within the system or remotely; it can be associated with a line, a set, or a Class of Service (COS) password.

It offers efficient system control and management.

Class of Service (COS) Password

COS password is a six digit code that lets you switch from your current class of service to one that lets you dial a number prohibited by your current class of service. It is used when DISA access is controlled with passwords. This feature has been enhanced to include an access package that defines the set of lines pools a user may access and provides access to remote paging capabilities. The number of COS passwords has been increased to 100 six digit passwords (from 19). In addition, a remote caller can change the Class of Service of an incoming call by dialing the DISA DN and entering a COS password.

Helps to maintain the security of the system by limiting access to authorized users and limiting those users to the features they require.

It minimizes unauthorized system access.

Compression of Feature Codes

Reach-through codes (link, run/stop, programmed release, pause) can be compressed to use less digit space in Autodial or Speed Dial programming modes.

Increases space for longer numbers, features or access codes in Autodial or Speed Dial sequences.

Conference (Three-Person)

Feature 3

A three-person call with two other internal or external parties can be created with this feature. Conferences are easily set up with

LCD prompts; Automatic Hold protects the first call from being accidentally cut off.

Allows you to hold a meeting over the phone.
Reduces meeting expenses.

Consultation Hold

A user can put a call or conference on hold to consult with others on another line; held parties can still talk to with each other.

A user can obtain additional information without having to terminate and later re-establish the call, thereby saving time and effort.

Coordinated Dialing Plan

Calls can be programmed to route over a network based on destination codes.

Network calls can be programmed in a manner consistent with local calls.

Custom Business Products Compatibility

Interfacing with an IBM-compatible PC is made possible with a PCI Card, allowing access to PC programs specially developed for Norstar.

Expands the system's level of functionality.

Customer Originated Trace *

The user can send the number of the last incoming call to the telephone company. This includes calls where the name and/or number have been blocked. Note: The user does not receive the number of the caller. Security procedures will vary with different telephone companies.

It helps eliminate malicious and nuisance calls.

Delayed Ring Transfer

An incoming call is automatically transferred to a "prime set" after a preset number of rings.

All calls are answered, thus improving customer service.

Dial "0" Station (Dial "X")

This designated receptionist set can be

reached from any other set in the system by pressing the intercom key followed by the designated digit.

A receptionist or control person in the office can be reached quickly and easily.

Dial Intercom

To quickly call co-workers internally, a user can press the Intercom button and dial the intercom number.

Provides easy access to co-workers, while keeping outside lines free.

Dialing Filters

Restriction override tables are replaced from previous Modular software versions; a maximum of 100 line, set, or line/set filters provide virtually unlimited flexibility in programming dialing restrictions and exceptions.

Access to lines can be well controlled.

Dialing Modes

Feature * 8 2

A user can select from the following dialing mode options:

Dialing Mode: Standard

Lets a user choose a line and dial a call using either the receiver or handsfree.

Offers a more efficient dialing process.

Dialing Mode: Automatic

Pressing a dialpad button will automatically select the set's Prime line, thus saving time.

A convenient, handsfree dialing option.

Dialing Mode: Pre-Dial

A person enters, checks and edits a number, before selecting a line.

Dialing mistakes are eliminated.

Dial Mode for Lines

Temporarily changes set from pulse to tone mode by pressing to signal external

systems and devices.

Improves external communications by letting users activate/access equipment such as voice recording devices.

DID Template

At System Start, template choices include a DID Template that automatically assigns target lines and received numbers as the set DN. When a system is expanded these assignments are preserved. (Typically programmed by the installer.)

Businesses with a network can easily integrate a new system or expand existing systems by using this template.

Direct Dial – Flexible Digits

A system-wide digit used to call a direct dial set can be any digit from 0-9.

Internal dialing and communications are enhanced.

Direct Dial – Multiple Attendants

Single digit access to an attendant. There may be up to five direct dial sets in the system, but each extension is assigned to a single direct dial set.

Improves customer service.

Direct Inward System Access (DISA)

Allows remote users to dial directly into the Compact ICS system to access Norstar features. Users hear a stuttered dial tone and must enter a Class of Service (COS) password to gain access to the system.

Provides added security by controlling system access. Remote access can be assigned to specific users who need to use the system's network connections or other services.

Users can access the system from remote locations using a Class of Service password. Used as a security feature to control remote access into the Norstar system using Central Office lines; configured with Loop, DID and E&M Trunks.

Controls Norstar system access.

Disconnect Supervision

After an external call disconnects, Norstar drops the line immediately.

Disconnect Supervision prevents the system from identifying a line as on hold or busy, thus denying access, when in fact it is really idle. (Note: the local telephone company must also support Disconnect Supervision.)

Discriminating Ringing at Set

Norstar sets ring differently for internal and external calls so users can easily distinguish between call types.

Provides improved call handling and customer service.

Distinctive Ringing/Call Waiting*

A user hears special ringing or call waiting tones, if the caller is included in a user-specified list of numbers.

Improves customer service by providing an indication of a special customer's call.

Do Not Disturb (DND)

Feature 8 5

Incoming calls will not ring at a set, but the LCD line indicator will continue to flash as calls are forwarded to the prime set.

Allows uninterrupted work when necessary.

Do Not Disturb (On Busy)

Internal and private network callers hear a busy tone instead of ringing while the user is on a call. External callers are transferred to the Prime set for answering. The line indicator for an external incoming call flashes, but the phone does not ring.

While busy on a call, it eliminates the distraction of a second line ringing, while ensuring that external callers are routed to an answering position.

Enhanced Trunking Connectivity Private Network – E&M (Tie) Trunk Connectivity

E&M Type II trunks can be connected to a Norstar system to create a private network between locations. For each system within

the network, the length of directory numbers (DNs), line pools, and line pool access codes are the same.

Ensures cost-effective efficient internal communications.

Enhanced Trunking Connectivity Public Network – DID Trunk Connectivity

DID (Direct Inward Dialing) trunks let incoming callers bypass the attendant and be directly routed to a target line.

Improves call handling.

Enhanced Trunking Connectivity Public Network – Remote Access

Remote access (with or without DISA) provides off-site remote access to Norstar's private or public network facilities, which avoids public network toll costs.

Helps to improve cost controls.

Executive Busy Override (Priority Calls)

Within a Norstar system, users can force a voice connection to busy set or one on "Do Not Disturb" anywhere in the system.

In the case of a true emergency, the calling party can establish contact.

External Call Forward

Allows the ICS to forward calls to destinations external to the system by utilizing outgoing lines.

Improves customer service by allowing a user to externally forward calls transferred to their intercom number.

External Calls on Intercom Keys

Program lines to ring on an intercom key.

User can utilize more buttons for features by using intercom keys for external calls.

External/Network Transfer

Allows the user to transfer calls not only internally, but over the public or a private network.

Improves customer service by allowing the user to transfer the caller to the correct party, even if they are not on the Norstar system.

External Line Access

Outside lines are directly accessed by buttons on individual phones or indirectly by a line pool.

Users can bypass the receptionist to place outside calls, thereby saving time and money.

Fax Switch

Fax Switch is a Compact ICS 4.1 feature that listens to incoming lines and automatically transfers the call to a fax machine connected to the Norstar.

This feature eliminates the need for an external device to monitor incoming trunk lines for Fax tones.

Feature Access Key

Feature *

A person can program any feature code onto a memory button.

Offers fast, single-button access to frequently-used features.

Flexible Call Restrictions and Overrides

Call restrictions and overrides can be applied to individual lines and/or sets, but can be overridden with passwords.

Maintains Call Restrictions cost control, yet provides access to selected numbers within the restricted categories.

Flexible Numbering Plan - Changing DN Length

The length of the Directory Number (internal number) can be from 2 to 7 digits. All DN's in a system must be of the same length.

Provides user with flexibility in assigning internal numbers. It is also helpful when the system is part of a network and a uniform series of internal numbers is required.

Group Listening

Feature

An incoming voice is heard on both handset and speaker, while an outgoing voice occurs only through the handset.

While a group listens to a call through the speaker, the caller hears more clearly through the receiver, as it eliminates background noise.

Group Set Copy

Allows the system programmer to copy data from one set to a range of DN's. Two options are provided: copy from a set to all like sets, or copy from a set to all like sets within a specified range (for example, copy data from a M7310 to all M7310's within the range). Copying can be done for a particular sub-heading of programming or to duplicate all or a portion of programming for a set.

Handsfree Answerback

Internal voice calls automatically turn on the set microphone so users can reply without touching the set. (Not available with the M7100.)

A user can answer the telephone and continue working; the caller terminates the conversation.

Handsfree – Automatic

A person can program the set microphone and speaker to automatically turn on every time a call is answered or placed. (Not available with the M7100.)

Saves time by providing more convenient handsfree operation.

Held Line Reminder

External calls on hold play periodic reminder tones over the set speaker until the call is retrieved.

Customer service is improved, because a user will be less likely to forget the call.

Hold – Automatic

An active line automatically goes on hold if the user forgets to press the Hold button, before selecting a second line, an intercom or a Transfer button.

Internal and external calls are prevented from accidental cut-off during transfers.

Hold – Exclusive

Feature Hold or Feature 7 9

Your call can only be retrieved at the set where it was placed on hold.

Your privacy is ensured.

I-Hold/U-Hold Indication

LCD line indicators will flash faster for held calls at the user's own set than for calls on hold at other sets.

It is easy to identify calls held at your own set from those held at others' sets.

Hospitality Services

Hospitality Services (HS) Feature Set is a group of new features introduced to enhance the usefulness of the Norstar ICS in small to medium sized Hotel/Motel/Hospital facilities.

- **Alarm** - Feature 8 7 5 provides an alarm clock capability on Norstar sets and analog telephones connected to an ATA or an ASM. Both room sets and common sets can be programmed to sound an audible alert at a requested time.
- **Room Condition (RC)** - Feature 8 7 6 allows users to exchange information about the serviced state of a room. Users are front desk attendants, and cleaning or maintenance personnel of an establishment.

- **Room Occupancy (RO)** - Feature 8 7 9 allows front desk operators to assign dialing restrictions to room sets, and also works with the Room Condition feature.

Hot Line

A set can be programmed to call a specific internal or external number whenever its handset is lifted or the handsfree button is pressed.

Convenient, direct access to a frequently-called location saves time and effort.

Hunt Groups

Hunt groups enable a group of sets to be called by a single directory number. Hunt Groups replace Incoming Line Groups on Modular ICS and Compact ICS 4.0 and higher. Three hunting modes are available: broadcast, sequential and rotary. All Norstar sets, Companion sets, PC Consoles and 2500 analog sets can be assigned to a hunt group.

Improves call answering coverage and allows calls to be directed to specialized knowledge.

Incoming Line Groups (replaced by Hunt Groups for Modular ICS and Compact ICS 4.0 and higher)

Incoming Central Office lines are grouped together under a line group and assigned to individual telephones. (Cannot be assigned to an M7100 set or to a single-line set attached to an ATA)

All calls over multiple lines can be answered by any telephone assigned.

Language Choice

Feature * 5 0 1 or * 5 0 2 or * 5 0 3

User can select one of three languages for their Norstar set: English, French, or Spanish. (The same system may have multiple languages active simultaneously.)

Provides the user with flexibility to accommodate alternative language requirements.

Last Number Redial

User can redial the last externally dialed number.

It is convenient to redial a busy number, and it saves time.

Line Assignment (Set)

A maximum of eight lines can be assigned to any of the sets in the system.

Line Names

Names can be programmed for incoming and outgoing lines.

Informs the user of whose line is ringing to permit more personalized greeting when answering; users can also quickly identify which outgoing line they are using.

Line Pool(s)

Feature

A user can select a line from a pool of lines using an access code when several external lines are shared by a group of telephones.

When lines are shared among a number of sets, line costs and the number of button appearances are reduced.

Line Pool(s) – Busy Status

When all lines in a Line Pool are busy, the associated LCD set indicator will turn on.

Saves time, because users don't have to keep checking for a free line.

Line Profile

Feature

Line settings programmed in Configuration and Administration will appear on the M7310 or M7324 set display. (Not available on Compact or 3X8.)

Programming information is easily verified.

Line Redirection

Feature

(Often referred to as **Selective Line Redirection**). Incoming calls on one or more lines can be redirected on a Norstar set to one or more locations outside the system

complying with associated dialing filters. Redirected calls cannot be answered from another set. (Not available with M7100.)

Users can receive calls at any location.

Line Selection

Idle or ringing lines are manually pressed to override the automatic line selection feature.

Lets a user override the Automatic Line Selection feature.

Link/Flash (Recall)

Feature

If the Norstar system is connected to a PBX or Centrex, a link signal can be used to access special features.

Allows the Norstar system to hear a “second dial tone”, before accessing Centrex or PBX features.

Listen On Hold

Users “on hold” may work handsfree while waiting by pressing the hold button, replacing the handset and then reselecting the held line . The call can now be monitored through the speaker.

Users can work handsfree, while waiting for the caller to return.

Log Space (CLID)

Call Log spaces have been increased to a maximum of 250 entries per system.

Logging Options

Feature

The user can determine which type of calls will be logged at a set (for example, no one answered, unanswered by me, log all calls, and no autologging).

Allows user to customize own set. Also allows the user to capture the calling information on important calls.

LOGIT (Manual Logging)

Feature

If calls are not automatically logged, Logit lets the user manually log an incoming call after it is answered.

Allows the user to capture calling information for only those calls important to them.

Long Tones

Feature

Sends long DTMF tones to access devices.

Users can operate devices requiring long continuous tones.

Loss Package

Compensates for Loop Start (analog) trunk quality. Allows selection of appropriate loss/gain and impedance settings for each line. The settings are based on the distance between location of ICS and the service providing Central Office.

Provides improved quality of service for customers with analog lines.

Maintenance Alarms

Alarm codes appear on a designated Alarm Telephone to notify users of a component fault and its location within the system.

Provides instant notification and diagnostic information for problems requiring distributor servicing.

Make Set Busy

Feature

Activated on a Centrex line, this feature makes the associated Centrex line busy.

Minimizes interruptions without losing calls.

Message Leave (List)

Feature

Display messages (“Message for you”) are sent to other set displays requesting a call back.

By leaving a message, time is saved as the caller does not have to keep calling back, or leave a message with a receptionist.

Message Waiting (List)

Feature

You can automatically call back the person who sent “Message for you” to your display or cancel the message.

Improves internal communications.

Message Waiting Lamp Indication

The combination of the Release 2 Business Series Terminals and the 4.1.1 software enables Norstar users to have a visual message waiting indication lamp in addition to the Message for You on the display of the telephone set.

Keeps the user aware of incoming messages with a single glance.

Move Lines

Feature

Assigned lines are moved to different LCD memory buttons on the set (except Handsfree, Intercom or Answer buttons) or Enhanced CAP. (Not available with the M7100.)

Users can customize the line appearance on their sets, as well as line answering patterns.

Music/Tone/Silence On Hold

External callers on hold within the system can listen to music (customer supplied), a periodic tone, or silence as preset by the System Administrator.

Tones or music assures callers they are still on hold and have not been disconnected, thus reducing the number of abandoned calls.

Network Direct Dial

User can dial one digit to reach a specific destination on either a public or a private network.

Saves time and improves productivity.

Night Service

Outside calls that normally ring at the Prime Set can also ring at additional, preselected sets during preset times.

After-hours calls can be heard or answered anywhere in the system, improving internal communications and customer relations.

Numbering Plan – Flexible

The length and sequence of digits needed to access other sets or outside lines can be controlled.

Users can be given intercom numbers to match other PBX and Centrex numbers.

On-Hook Dialing

A user can conveniently choose to dial directly from the dialpad and speak using the handset or Handsfree button.

Convenient for the user.

Outgoing Name and Number Blocking (ONN)

The ONN feature allows **outgoing** callers to block their name and number so that they can not be identified, on a per call basis. ONN is a direct block against CLID devices. Once ONN is activated by the caller on the Norstar the CO is alerted to block the calling party's name and number to the person being called.

Outgoing Name and Number Blocking increases caller confidentiality and guarantees privacy and security on a call by call basis.

Paging – Internal

Feature 6 0 **Internal zones**

Feature 6 1 **Zones 0-6**

A user can initiate a page or be paged internally through the set speakers. It is also easy to make announcements through the Norstar set speakers to a select group of users or to all sets.

Users away from their sets, but within the office, can still be notified of calls.

Paging Feature Enhancement

Page time-out is now programmable and a system-wide parameter can now administer the paging tone to be “on” or “off”.

Minimizes the length of time the feature is tied up at one set or left on by accident.

Paging – External

Feature 6 2

When Norstar is connected to a user-supplied amplifier and speaker, the user can make external paging announcements.

Paging announcements can easily be sent to rooms or areas without telephone sets.

Paging – External and Internal

Feature 6 3 **Zones 0-6**

Announcements can be made using both the Norstar set speakers and the office loudspeaker system.

It is easy to make system-wide announcements to everyone within your organization.

Paging Set Access

Individual sets can be denied the ability to perform paging.

Improved security of paging system. Sets in open areas can be denied the ability to page, for example, classrooms or motel rooms.

Passive CLID

The CLID feature on Compact ICS is an enhanced version of that found on the Norstar DR5. Now, the same information can be delivered to all Norstar sets with a ringing line appearance, instead of displaying the information about an incoming call to one set only.

Ideal when employees share phones or move around an office.

Password Protection

The system administration password can be changed by the coordinator for added security.

This security feature helps to protect system programming data.

Pre-Selection/ Call Screening

The assigned name of the caller's set or line will appear on the set display.

The user can identify the caller or the line being used.

Prime Line

A line (CO, Intercom, or Line Pool) can be assigned to a set as its primary line of use for automatic outgoing line selection.

It saves time, as a user can begin dialing immediately without selecting a line.

Prime Set

A set can be designated as prime or back up to receive unanswered calls via Delayed Ring Transfers, Held Line Reminders and Do Not Disturb transfers, and overflow call routing.

Offers more efficient call handling.

Priority Call

Feature 6 9

This feature can interrupt a conversation on a busy set or override Do Not Disturb (DND). Users have the option to block a Priority Call, but it cannot be ignored.

In the case of an emergency, the caller can be reached.

Privacy - On Lines

Privacy automatically prevents another telephone, which shares your line, to access or join your call.

Security and confidentiality are assured.

Privacy Control

Feature 8 3

The Privacy ON/OFF switch lets a third person join the call.

A two-way call is easily turned into a conference call.

Programmed Release

Feature * 8 9

Programmed at the end of an external autodial sequence from a PBX or Centrex. It works like RIs, but retains the line for that user.

Time is saved by letting a single button be programmed to end a call once the information has been sent.

Receiver Volume

Volume can be programmed to retain the user's desired setting. All Norstar sets purchased after August 1994 are compatible with the Receiver Volume feature.

Individuals within the system can set their own receiver volume.

Remote System Access

Allows callers on the public network to access the system directly, without going through the attendant. Once in the system, caller can access some of the system's resources (dialing capabilities, line pool access, feature access). The Compact ICS supports remote system access on auto-answer loop start trunks (Disconnect Supervision must be enabled).

- **Auto Answer DN** - when a user dials into the system on an auto-answer loop start trunk that is not configured to answer with DISA, no password is required to access the Norstar system. The Class of Service (COS) that applies to the call is determined by the COS for the trunk on which the user is calling.

- **DISA DN** - when a user dials in on a trunk that has auto-answer with DISA, the system presents a stuttered dial tone to prompt the user to enter their Class of Service password. The Class of Service that applies to the call is determined by this COS password.

Restriction Override Password

Feature 6 8 + Password

A user can bypass any call restrictions applied to any set or line.

Selected users are given convenient and efficient access to a restricted set or line.

Ring Again on Busy Set

Feature 2

It alerts a user when a previously busy set becomes available.

Users save time because they are free to continue working, while waiting.

Ring Again on Busy Line Pool

A user is alerted when a line becomes free in a line pool.

This feature saves time and frustration as users can continue working without monitoring the availability of busy outside lines.

Ring Again on No Answer

Norstar Ring Again notifies a user when a set that was not answered is used.

Avoids unnecessary redialing. It is an efficient way to know when someone has returned to their office.

Ring Line Preference

When several lines are ringing, the longest ringing call will automatically be queued to be answered first.

Provides better customer service as a user can answer calls in the order they were received.

Ring Service

Now alternate ringing can be programmed for day of week as well as time of day.

Provides the flexibility to change which set rings after hours or on weekends.

Routing Service/Destination Codes

A programming section that allows outgoing calls to be directed automatically, based on the numbers a caller dials (also called Automatic Route Selection - ARS). For systems linked in a network, routing can create a transparent or coordinated dialing plan.

To make programming routes easier, digit absorption feature has been added to the Routing feature of the Norstar ICS. Digit absorption selects the portion of the destination code that is always absorbed by the system and not used in the dialing sequence.

For the Norstar ICS, ARS allows the programming of 500 destination codes and 999 routes.

Installer programming time is greatly reduced in terms of entering the routing codes and more flexibility is provided for routing codes.

Saved Number Redial

Feature 6 7 or last number key

It saves and later recalls the external telephone number appearing on the display.

A person can quickly redial the number saving time and effort.

Selective Call Rejection *

When activated, incoming calls are screened against a user-specified list of numbers to be rejected. If rejected, the caller hears a message informing them the called party does not wish to receive their call; the last incoming number can be added to the selective call rejection list even if the number is "Private".

This feature provides an effective deterrent to malicious and nuisance calls especially when combined with Call Trace.

Selective Line Redirection

See Line Redirection.

Set Names

Names can be programmed for internal sets.

Lets users screen calls and verify status on the LCD display; forwarded calls are answered more professionally, because the display shows to whom the call was originally placed.

Set Profile

Feature * * 7 3 8

Using an M7310 or M7324, the user can view system administration data for each set in the system.

Improves network control, as an administrator can view programming information on specific set configurations and general administration data.

Service Modes

Feature 8 7

Three different service modes can be programmed (lunch, evening, night) with their own ringing arrangements for automatic or manual activation.

Increased control over the system call handling set-up over three periods of time offers greater system flexibility.

Speed Dial Access – Personal and System

Feature 0 + code

Allows a person to access both Personal and System Speed Dial Codes.

Prevents dialing mistakes, saves time, and is more convenient.

Speed Dial Line Selection

For speed dialing, the system will use a specific line as determined in administration.

Line selection allows the preprogramming of specific lines for each number.

Speed Dial – Personal Programming

Feature * 4

Allows a user to add or change a Personal

Speed Dial number on their set.

Fast error-free dialing is provided for a user's personal telephone directory, with increased flexibility.

Speed Dial System Bypass Restrictions

Speed dial numbers can be programmed to override set and line restrictions.

Allows easy access to selected numbers within restricted categories.

Speed Dial System Names

A name, instead of a number, can be programmed to appear on the set display whenever that speed dial code is accessed.

Keeps confidential the actual number being dialed.

Start DN Option

Allows user to choose the start Directory Number and Directory Number Length, rather than the previous mandatory 221. Typically programmed by the installer under Configuration.

Provides flexibility of uniform Directory Numbers over a network.

Station Set Test

Feature 8 0 5

Provides users with the ability to determine if there is a physical problem with their Norstar set before returning it to the distributor or factory for repair.

- Pressing Feature 805 on the set activates Station Set Test. The LCD prompts the user through the testing procedure.
- All tests are available for all sets, with the exception of the Headset Speaker Test, which is not available on the M7100, because it does not have a headset option.

If users or service representatives suspect something is wrong with a button, the speaker, the display, or some part of the Norstar set hardware, a quick test can be done to see which part is broken.

Target Lines

A Target Line is a virtual line, not physical, dedicated to receiving and routing incoming calls on DID or auto-answer trunks to a specific destination; DR5 supports up to 104 target lines that offer attendant bypass and line concentration.

This software enables the optimum use of available resources.

Telephone Administration Lock

Three settings (Full, Partial, None) can be programmed in Administration.

It controls the specific features a user can program/use on their set.

Time and Date Display

The time and date appear on the LCD display of an idle set.

It eliminates a person's need to have a workstation clock .

Time and Date – Show Time

Feature 8 0 3

Temporarily displays for three seconds, the time and date while on a call.

It can prove useful in a busy office environment.

Timed Release

Feature 7 2

Signal releases a call from the line, but keeps the line for another call.

If you are making consecutive fax or data calls, you don't have to worry about access to that line.

Transfer Immediate (With Callback)

Feature 7 0

A call can be transferred directly to another set; if unanswered, callback occurs after a preset number of rings.

Improves handling of transferred calls.

Transfer Using Conference

The Conference/Transfer button can be used to transfer a call to an internal number.

Ensures a party is not lost during a transfer; better customer service and more professional call handling result.

Transfer Using Hold

The Hold button can be used to transfer a call.

Provides a quick, convenient method for transferring users sharing the same line appearances.

Transfer with Announce

A user announces an internal or external call to the designated party before transferring it by simply staying on the line. To do an immediate transfer, press "OK" softkey or the release key.

The user transferring a call can verify the person is available to receive the transfer.

Unsupervised Conference

A conference call can be established with two outside parties; the user can then exit from the call without disconnecting the remaining two people, provided one of those callers was incoming and the incoming line has Disconnect Supervision.

Two parties can continue a conversation not relevant to the third one without the inconvenience of disconnecting and re-calling each other.

User Preferences

Provides an alternative method for programming user's administration features. The following can now be programmed in one session from any phone in the system for a single set or a group of sets: external autodialers, feature keys, language, display contrast, call log options, internal autodialers, personal speed dialers, ring type, and dialing modes.

Time saving and efficient.

Voice Call

Feature 6 6

A user can save time by making a voice announcement or beginning a conversation through the speaker of another telephone.

Saves time.

Voice Call Deny

Feature 8 8

This feature prevents a set from receiving Voice Calls.

Interruptions from Voice Calls can be prevented, while the user is still alerted of incoming internal calls.

Wait for Dial Tone

This feature causes a sequence of numbers to pause until dial tone is present on the line before continuing to dial. (The system must be equipped with a Services Cartridge.

Systems with ICS software do not require additional hardware for this feature.)

Telephones, Accessories, and Peripherals

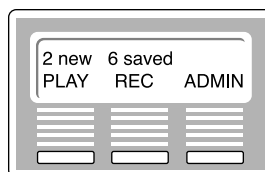
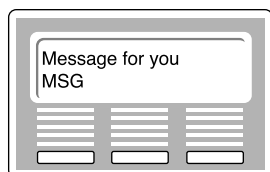
More than a base core unit is required to make a Norstar system functional. Other proprietary products, such as telephone sets, must be added. Products can be selected from three main product groups: telephones, accessories and peripherals.

This chapter contains updated information on these products, including the new Business Series Terminals (BSTs).

Norstar Telephones

All M7000 series Norstar telephones are equipped with an integrated LCD window that guides you through using your phone *while you are using it*. So users don't spend time in exhaustive training. Plus, all five Norstar telephones provide access to Norstar system features and integration with all Norstar applications.

A telephone that shows you how to use it



Phones with standard features, not options

Norstar's integrated LCD Window, standard on every set, prompts users through feature usage step-by-step. Softkeys make it even easier.

- When integrated with Norstar voice messaging, the LCD Window displays "Message for You."
- The built-in speakerphone found on Norstar telephones provides "handsfree" operation (not available on M7100).
- A headset can be plugged into the Norstar telephones for another method of handsfree operation (not available on M7100).
- Background music and paging can be heard through the speaker on all Norstar telephones.
- Volume Control allows users to set handset, ringer, voice and speaker volume.

- Standard 9-foot cords and wall-mount brackets make it easy to adapt the installation and position of the phone to a user's needs.
- Norstar's Quick Reference Card, mounted conveniently under the handset, reminds users at a glance how to access additional features.

Easy to get Started

Norstar is preprogrammed at the factory for the most commonly used features and functions, so that installation and start-up time is minimal. Users just pop on Norstar's professionally pre-labeled key caps, and their telephone is ready to use!

- Norstar's LCD window, standard on every telephone, guides users as they use a feature.
- Norstar's user cards "map" simple instructions on where to find buttons and how to use them.
- Norstar prompts in either English, French, or Spanish make employee orientation easy.
- Programmable buttons may be personalized as outside lines, intercoms, speed-dial numbers or favorite features.
- Norstar intercom (internal) lines make sending a message fast and simple.

Easy to Make Calls

Norstar improves business efficiency by making it easy to place calls and use features.

- Place calls faster. Just pick up the handset and Norstar's Automatic Line Selection chooses a free line.
- Eliminate telephone tag. The combination of Norstar's Ring Again and Internal Messaging makes it easy to keep in touch.
- On-Hook Dialing and Last Number Redial make calls quickly and easily, without picking up the handset.
- Notify a co-worker of urgent incoming calls or interrupt a conversation with an important message using Priority Call.

Easy to Manage Calls

Standard and optional Norstar features guarantee users never lose a call.

- Move flawlessly through feature operations! Norstar's LCD window prompts you one step at a time.
- Automatic set relocation lets users move their telephone without losing their programming.
- Work without interruption with features like Do Not Disturb and Call Forward.
- Norstar's LCD window shows users how to transfer or conference and confirms that the call is complete.
- It's easy to page someone – just touch "Page" and make an announcement through the Norstar phone, auxiliary speakers, or both.
- Place calls faster. Touch a memory button to dial frequently called numbers.

Easy to Add Options

Norstar's flexible design makes it easy to add options that tailor the system to your needs.

- Norstar Applications integrated seamlessly with Norstar telephones to help businesses improve employee productivity and increase revenue and customer service levels.
- Choose Background Music and Music on Hold for personal enjoyment and that of customers.
- For additional convenience, Night Service Bells, Auxiliary Loud Bells, and External Page Speakers can easily be connected.
- Attach a Key Lamp Module to any M7324 telephone and establish a Central Answering Position. Snap a Busy Lamp Field onto a M7310 telephone to establish an Attendant Position.
- Plug a Norstar CTA device into your telephone to enable CTI applications, like Personal Call Manager.
- Attach a plastic set cover to protect Norstar telephones and the CAP module from dust and dirt in rugged use environments.

Provide Superior Service to Customers or Clients

- Norstar gives you access to the powerful features of the public telephone network through the telephone set.
- With Norstar, users can see who is calling before they pick up the handset. (Dependent on Calling Line ID services from the local service provider.)
- Norstar's Call Log captures each caller's number, allowing users to see on their LCD Window who called, how many times they called, if those calls were answered, and by whom.

Third parties continue to develop software programs that enhance Norstar. Applications such as call accounting, personal call managers, and database look-up take advantage of Calling Line ID features. The combination of Norstar systems and applications and network services create an office environment that can save time and help offices run more smoothly and efficiently.

Set Test

End users have the ability to determine if there is a physical problem with the Norstar telephone before it is returned to the distributor or factory for repair if their system is equipped with Compact ICS 1.0 or later, or Modular ICS 2.0 or later. If users or service representatives suspect something is wrong with a button, the speaker, the displays or some other part of the Norstar telephone hardware, a quick test can be done to see which part of the telephone is broken.

- Pressing 8 0 5 on the telephone set activates Station Set Test. The LCD display prompts the user through the testing procedure.

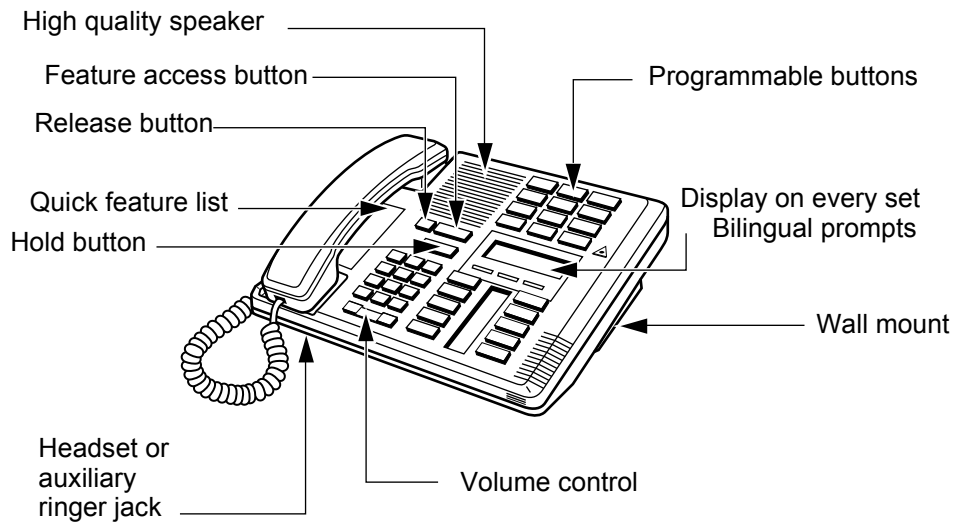
All tests will be available for all sets, with the exception of the Headset Speaker Test, not available on the M7100, because there is no headset option.

Telephone Models

Model and definition

M7310	M7: Norstar Product	3: 2 LCD Display, 1 Handsfree	10: LCD Memory Buttons
M7208	M7: Norstar Product	2: 1 LCD Display, 1 Handsfree	08: LCD Memory Buttons
M7100	M7: Norstar Product	1: 1 LCD Display	00: LCD Memory Buttons

Telephones are the best advertisement for any telephone system because users see and use them every day. The three proprietary Norstar terminals listed above were designed to be excellent advertising for Norstar. While these sets share many similarities, each one has its own specialty in terms of feature capabilities and functionality.



Common Norstar Telephone Features

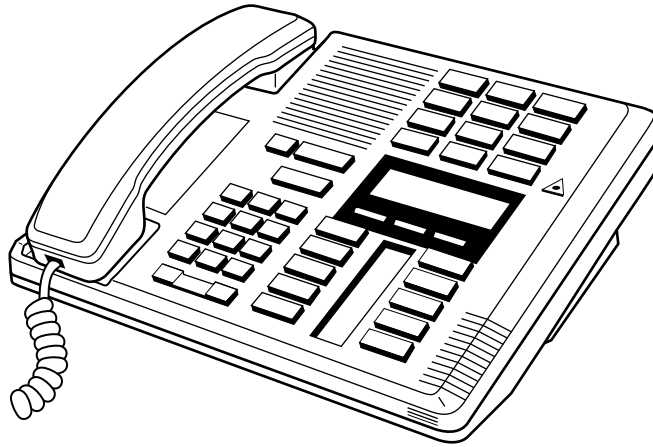
	M7310	M7208	M7100
Display			
• LCD Lines	2	1	1
• Characters per line	16	16	16
• Display buttons (Soft keys)	√		
Handsfree	√	√	
Headset Jack	√	√	
Loud Ringer Interface	√	√	√
Memory Buttons			
• With indicators	10	8	0
• Without indicators	24 ⁽¹⁾	0	1
Volume Control			
• Ringer	√	√	√
• Speaker/Handset	√	√	√
Wall Mountable	√ ⁽²⁾	√	√
Accessories			
• BLF Module	√		
• CAP/KLM Module			
• SAPS	√	√	√

(1) 12 Dual-function buttons.

(2) Not when a BLF or a CAP module is attached.

(3) Handset fits in the cradle on a wall mounted base.

M7310 Telephone



Description

The M7310 (Feature Set) is capable of handling extensive calling and call handling requirements. The 12 dual-function memory buttons, with a Shift button, provide access to a total of 24 additional frequently-used features or autodial numbers. A Busy Lamp Field (BLF) can be attached to the M7310 to monitor the station status for buttons programmed for internal autodials.

Target Audience

The M7310 is ideal for group answering positions, such as secretaries, managers, professionals, and Norstar system administrators with or without a BLF. Businesses requiring extensive autodialing and feature access would also benefit from using this telephone.

Applications

The M7310 is useful for departments, such as purchasing, sales or accounting, where the same suppliers, customers or accounts are frequently called. For secretaries, the M7310 and BLF can provide backup answering services. Norstar system administration is made easy using the M7310.

M7208 Telephone



Description

The M7208 (Square Set) is well suited for lower internal and higher external calling volumes; it supports up to any combination of eight lines and frequently-used features.

Target Audience

The M7208 is a cost-effective set for users needing only a few programmable features and/or autodial numbers.

Applications

The M7208 can be used as a courtesy phone in lobbies, cafeterias, reception areas, or staff lounges. It is also suited for areas where staff numbers are relatively high compared to the number of telephones needed, such as manufacturing plants, retail departments, or repair centers.

M7100 Telephone



Description

The simple design of the M7100 (Basic Set) delivers Norstar functionality and reliability to areas or users with low-set usage requirements.

Target Audience

Companies who want an easy-to-use, functional set in low traffic areas should consider the M7100.

Applications

The M7100 provides phone coverage in areas where basic service is required, such as reception areas, lobbies, and office kitchens.

Business Series Terminals

M7324 Telephone



Model and definition

M7324	M7: Norstar Product	3: 2 LCD Display, 1 Handsfree	24: LCD Memory Buttons
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M7324 Telephone Features

Display	
• LCD Lines	2
• Characters per line	16
• Display buttons (Soft keys)	√
Handsfree	√
Headset Jack	√
Loud Ringer Interface	√
Memory Buttons	
• With indicators	24
• Without indicators	0
Volume Control	
• Ringer	√
• Speaker/Handset	√
Wall Mountable	√ ⁽¹⁾
Accessories	
• BLF Module	
• CAP/KLM Module	√
• SAPS	√

(1) Not when a BLF or a CAP module is attached.

Description

The M7324 (Expanded Set) is the best choice for a full-featured telephone or central answering position, because it offers 24 programmable buttons with an LCD for one-button access to any combination of lines, features and autodial numbers. Up to two Central Answering Position (CAP) modules, also known as Key Lamp Modules, can be attached to a telephone - adding 48 buttons per module, to create powerful call coverage for many lines or to accommodate additional Norstar features (refer to section on CAP module for configurations).

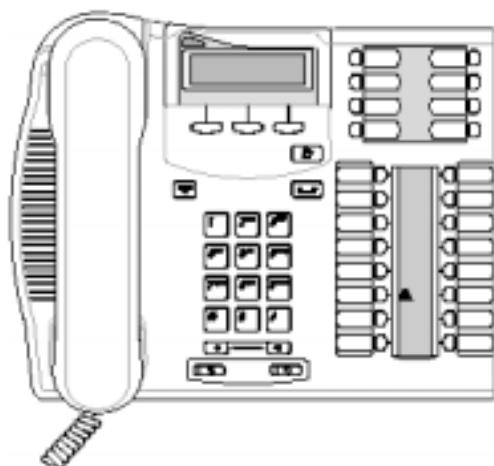
Target Audience

The M7324, with or without CAP/KLM modules, is designed for secretaries and receptionists for centralized call answering. It is also useful for managers, professionals, and system administrators requiring high feature usage and access to various lines, such as WATS and private lines.

Applications

For smaller applications, the M7324 by itself, is a central answering position; larger applications require the addition of CAP/KLM module(s). Stock brokers could use it with two modules for fast autodial access to preferred customers. Users with wide-ranging needs, such as consultants, might use it for Speed Dialing, Conference Calling and Call Forwarding. The M7324 is also useful for Norstar system administration.

T7316 Telephone



Description

The T7316 has a two-line, 16-character-per-line LCD window with MWI/VRL. Three display buttons under the LCD window are used to respond to instructions in the second line of the two-line display and access additional software features such as Voice Mail. Included are features such as visual ring indication, handsfree, ten memory buttons with LCD indicators for one-button access to a combination of lines, features and autodial numbers, six memory buttons with LCD indicators for one-button access to features and internal extensions, and eight memory buttons without LCD indicators for one-button access to a combination of autodial numbers and features that are standard on this set. The T7316 provides access to a total of 24 Memory Buttons, and it offers ample coverage for business call areas and support for feature-intensive usage. It offers three Soft-keys to assist employees using the visual display prompts on the LCD.

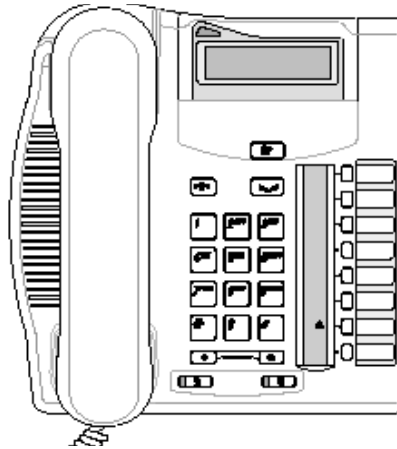
Target Audience

The T7316 is ideal for a variety of user groups, including managers, executive professionals, and receptionists, as well as for businesses that want a versatile set for central answering and administrative positions.

Applications

The T7316 is well suited for users needing multiple lines and features, such as department managers and receptionists.

T7208 Telephone



Description

The T7208 is uniquely suited for lower internal and higher external calling volumes, and it supports up to eight lines and frequently used features. This multi-line telephone offers eight fully programmable buttons, a 16-character LCD window with MWI/VRL, and a headset jack. There are no display buttons (Soft-keys) on the T7208.

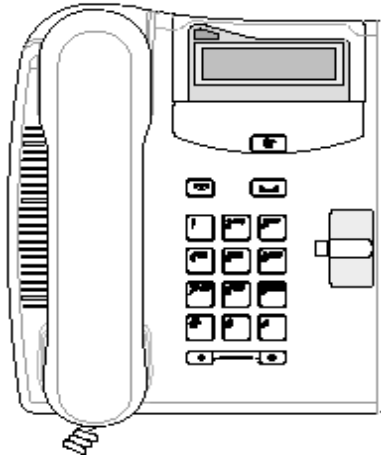
Target Audience

The T7208 is a cost-effective solution for users needing only a few programmable features and/or autodial numbers.

Applications

The T7208 is well suited for a variety of applications, such as reception areas and for workstations with moderate call volumes and activity—as well as areas with shared telephones, such as manufacturing plants, retail departments, or repair centers.

T7100 Telephone



Description

The T7100 delivers Norstar functionality and reliability to areas or users with low-set usage requirements. The T7100 telephone has one programmable button and a 1x16 character alphanumeric display to provide call progress information. There are no display buttons (soft-keys) on the T7100. The T7100 does not support headset or Handsfree.

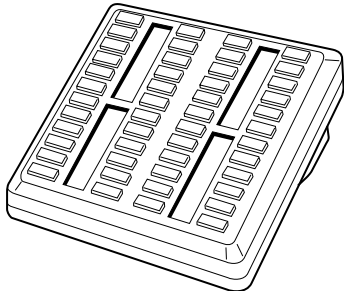
Target Audience

Companies that want an easy-to-use, functional set in low traffic areas should consider the T7100 telephone.

Applications

The T7100 provides phone coverage in areas where basic service is required, such as lobbies, office kitchens, reception areas, and break rooms.

Central Answering Position (CAP)/Key Lamp Module (KLM)



Description

The CAP/KLM is a module connected to an M7324 telephone that provides 48 additional memory buttons that can be used to show a busy or idle status for up to 48 more sets, as well as, to program system features or autodial numbers. Up to two CAP modules can be added to any M7324 set. One Station Auxiliary Power Supply (SAPS) is required to power every two CAP modules.

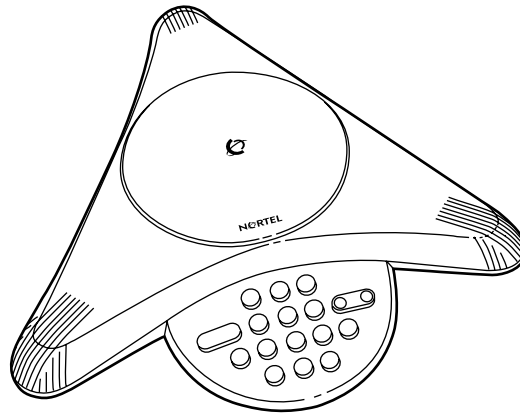
A telephone with one or two CAP modules must be assigned enhanced CAP status in order to provide line appearances or access to Central Office lines.

Up to five enhanced CAP positions can be supported on Modular ICS systems. The Compact ICS supports one enhanced CAP position. (Note that CAP positions can have one or two CAP modules attached, what counts is the total number of positions as opposed to modules.)

Target Audience

Secretaries and receptionists with M7324 sets responsible for call coverage for many lines will find the CAP very useful. Secretaries, managers and others providing backup answering services will also improve their productivity using a CAP module, as will people requiring high feature usage or line access capabilities, such as telemarketing center managers.

Norstar Audio Conferencing Unit (NACU)



Description

The Norstar Audio Conferencing Unit, designed in partnership with Polycom, offers superior teleconferencing by using three microphones to provide 360 degrees of voice coverage. The Conferencing Unit is a full duplex handsfree unit. This feature allows voice to be heard and picked up at the same time, providing faster response time and eliminating conversation “collisions” and losses. The unit has a Norstar Feature Key, which allows access to many of the same features found on the M7000 series of Norstar phone sets. Like the M7000 series phone sets, the NACU connects to the Norstar via a station port.

Target Audience

The Norstar Audio Conferencing Unit is the ideal teleconferencing solution for medium and small-sized conference rooms, and for private offices where the individual is frequently engaged in teleconferences.

Note: For best performance, persons speaking on the teleconference should be no more than six feet away from the NACU and the room housing the NACU should be no bigger than 10 x 13 feet.

Norstar PC Console

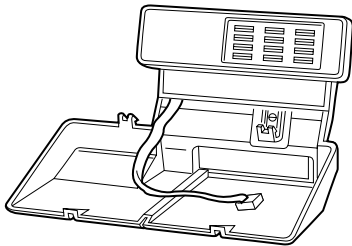
Description

Norstar PC Console provides telephone system attendants with a PC-based graphical user interface for quick and easy handling of incoming call traffic. PC Console is used in conjunction with a Norstar telephone set to provide an enhanced interface for busy call answering positions. See the Computer Telephony Integration section of this handbook for further details on PC Console.

Accessories

- Busy Lamp Field (BLF),
- Norstar Plastic Set Covers,
- Central Answering Position (CAP)/Key Lamp Module (KLM),
- Liberation Headsets,
- Station Auxiliary Power Supply (SAPS).

Busy Lamp Field



Software

Independent of software

Telephones

M7324

M7310 ✓

M7208

M7100

Description

The Busy Lamp Field creates an attendant position to monitor the status (busy or idle) of internal autodial keys programmed onto the dual programmable buttons of the M7310 set to which it is attached. No additional power or wiring is required.

Target Audience

When a BLF is attached to an M7310, it becomes an excellent receptionist or secretary phone for smaller Norstar configurations where line and internal autodial capacity are limited.

Norstar Plastic Set Covers

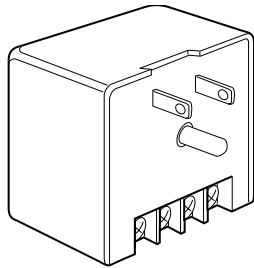
Description

The plastic set cover is designed to protect Norstar telephones and the CAP module from dust and dirt in rugged use environments. It is made of a clear plastic material that is molded to the face of the telephone set, protecting all keys.

Target Audience

The set covers are ideally suited for locations like automotive garages, warehouses, manufacturing facilities, and restaurant kitchens.

Station Auxiliary Power Supply (SAPS)



Software

Independent of software

Description

The Station Auxiliary Power Supply extends the loop length from 1,000 to 2,600 feet between a set or terminal and the Norstar system using a dedicated cable to connect the two locations. One SAPS powers up to three sets at 2,600 feet or two CAP/KLM modules (which do not have to be connected to the same M7324 set) at 1,000 feet.

Target Audience

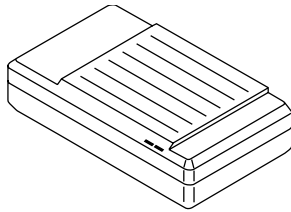
The Station Auxiliary Power Supply is ideal for Norstar installations in large facilities, such as shopping centers, warehouses, airports, and manufacturing floors.

Peripherals

- Analog Terminal Adapters (ATA),
- Call Identification Interface (CII),
- Doorphone,
- Remote Access Device (RAD),
- Station Message Detail Recording (SMDR),
- Voice Mail Interface (VMI).

For more information about the Computer Telephony Adapters (CTA) products see the Norstar Computer Telephony Integration section of this handbook.

Analog Terminal Adapters



Description

The Norstar Analog Terminal Adapter-2 (ATA-2) converts Norstar digital interfaces to analog for communication with such analog devices as single line telephones, FAX machines, modems and answering machines. Single line sets can interface with Norstar system features such as Call Waiting, Call Forward and many more. The ATA-2 provides a means of connecting a single line set to the Norstar system in either a long loop or off-premise extension configuration.

The Analog Terminal Adapter-2 (ATA-2) supports all the features currently supported by the EATA. As well, it has been enhanced to support faster data transmission speeds, up to and including 28.8 kbps, and has a more compact design for a simplified installation. (Note that the maximum data transmission rate is subject to the quality of the end-to-end channel and cannot be guaranteed.)

The ATA-2 is powered by a grounded AC power supply that is packaged with the ATA-2.

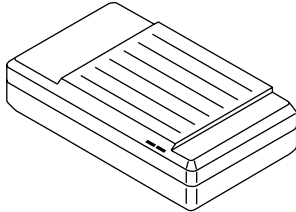
CMS/CLASS feature interworking is not supported by any version of the Analog Terminal Adapter.

Note: For high density analog connectivity with a Modular ICS, customers may make use of the Analog Station Module. For more information about the Analog Station Module, see the Hardware section of this handbook.

Feature Support Chart

	ATA-2
Separate Power Supply	√
Alternate Line	√
Call Forward	√
Call Park	√
Call Pickup – Group or Directed	√
Call Queuing/Waiting	√
Camp	√
Centrex/PBX Reach Through	√
Conference	√
Hold – Exclusive	√
Hold – Public	√
LNR	√
Line Pool Selection	√
Link	√
Page – General	√
Page – External	√
Page – External/Internal	√
Page – Internal	√
Priority Call	√
Privacy Control	√
Reach Through – Timed Release	√
Restriction Override	√
Ring Again	√
Saved Number Redial	√
Send Message	√
System Speed Dial	√
Tones On	√
Transfer	√
Trunk Answer	√
Voice Call	√
Voice Mail – Access via DN	√
Voice Mail – Mailbox access	√
Voice Mail – Leave message	√
SMDR Account Codes	√
CDR Account Codes	√
Toll Restriction Improvements	√

Call Identification Interface (CII)



Software	CII C6	CII M8
3x8 DR5		
DR1 (3x8, 6x16, 8x24)		
Compact DR2		
Compact DR5	√	√
Compact DR5-DS	√	√
Modular DR2		
Modular DR3		
Modular DR4		
Modular DR5		√
Centrex, CTX+		√
Not compatible with the ICS platform. Functionality is built into the Calling Line ID cartridge.		
Telephones		
Independent of terminals		

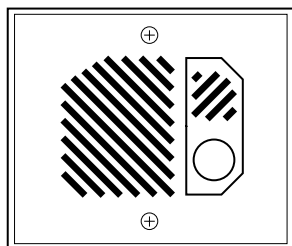
Description

The Call Identification Interface (CII) detects and converts incoming CLASS/CMS call information to a message on the Norstar messaging channel. When used with DR5 software, it provides call display information and associated features to designated telephones in the system including CO Voice Mail Message Waiting Indication.

There are two models of CII for use with the Norstar Compact 6x16 and Modular 8x24 systems: Compact CII (CII-C6) and Modular CII (CII-M8). (On Norstar 3X8 the CII is integrated into the system.)

The CII has EATA plastics and distinctive labeling identifying it as a six-line unit (for Compact) or an eight line unit (for a Modular system). It requires only one dedicated station port on the Norstar system. For the Modular 8x24, the CII-M8 connects to the core system only. For lines connected to a Modular Trunk Module, a CI Trunk Cartridge must be used.

Doorphone



Software

Compact ICS, any release	✓
Modular ICS, any release	✓
3x8 DR5	✓
DR1 (3x8, 6x16, 8x24)	✓
Compact DR2	✓
Compact DR5	✓
Compact DR5-DS	✓
Modular DR2	✓
Modular DR3	✓
Modular DR4	✓
Modular DR5	✓
Centrex, CTX+	✓

Description

The Doorphone is a fully digital, wall mounted, TCM-based terminal that connects directly to a Norstar station port. It requires no analog terminal adapter, external power supply or hardware programming. When equipped with the optional Door Opening Controller (DOC), the Doorphone provides security and convenience for Norstar users wherever an intercom and/or controlled access is required.

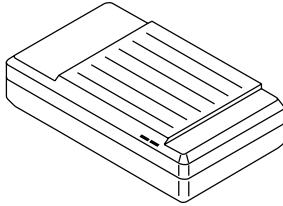
Pressing the “Call” button on the Doorphone places an intercom call to one or more Norstar telephones on the system, simultaneously displaying the Doorphone name in the LCD window. Calls can be answered either with the handset or on handsfree. If a call is not answered, an optional page (distinctive chime) may be directed to telephones in a selected zone. The Doorphone can also be programmed to be answered by voice mail.

Up to four Doorphones can be supported on a Norstar system with each Doorphone capable of being programmed to ring and/or page a different group of sets, providing flexible call coverage.

Equipped with the optional DOC, the Doorphone allows the occupant to unlock electric doors simply by pressing an OPEN softkey display button or a dial pad digit on their Norstar set. In addition, because the Doorphone with the DOC enables electronic devices to be controlled through contact closure (third party supplied), dial pad digit commands from a Norstar telephone allows a building occupant to remotely activate alarm systems, surveillance cameras, lights, etc.

Each Doorphone can communicate with up to twelve DOCs, providing control of up to twelve electrical devices through the telephone dial pad.

Fast Remote Access Device (Fast RAD)



Description

The FastRAD offers improvements in data transmission rates and security and replaces the enhanced RAD.

The FastRAD is an integral part of local and remote administration and maintenance capabilities of Norstar. It is located on the customer premises and is the physical interface hardware connection.

Remote administration and programming PC applications such as Norstar Remote Utilities, the Companion Diagnostic System (CDS), and Companion Manager, communicate with the ICS using the FastRAD. It uses its built-in modem to provide a communications interface between the target Norstar system and the PC. It can also provide access to the proprietary Norstar D-channel information for the translation and processing of Norstar administration commands, and automatic detection and reporting of ICS alarms.

Customers using the FastRAD with NRU will realize the following benefits:

- Reduced operational costs due to faster transmission speeds,
- Enhanced security with user defined passwords and access lockout,
- Improved customer satisfaction due to faster response times,
- Distributor image as a responsive service provider making use of leading edge technology.

The FastRAD is more compact than the existing RAD and is powered through an external power supply. It can be mounted horizontally with the connectors facing up or vertically with the connectors facing to the right.

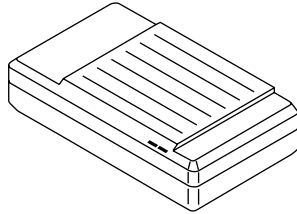
The FastRAD is connected to the operations center through the Norstar ICS and the public switched telephone network. Remote communications are provided through a secure data link at speeds up to 14,400 bps. Full duplex communications are provided by an internal modem that supports the V.32/V.32bis protocols. These protocols support modem rates of 14.4k, 9600, and 4800 bps. Since there are no external CO line interfaces built into the FastRAD, the only remote connection can be made through an ICS line.

The FastRAD also provides access from a local terminal. The local terminal connects to the FastRAD through an RS-232 port running at 300, 1200, 2400, 4800, 9600 or 19,200 baud. The

design and operation of the FastRAD assumes that only one FastRAD will be connected to the ICS.

An optional software keycode can be purchased to enable the Internal RAD (IRAD) of the Compact ICS.

Station Message Detail Recording (SMDR)



Description

Station Message Detail Recording (SMDR) serves as an interface that lets the user track basic call detail information by: all calls, outgoing calls only, calls with an account code, or by long distance calls. Connected to any station port, it provides basic reports in Norstar or Meridian 1 format. The unit is the interface to import call detail information into Norstar PC Applications software. There are five versions of SMDR.

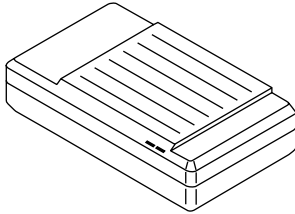
SMDR supports the following capabilities:

- CLID and ANI information in Norstar and SLI format;
- ISDN trunks and terminals;
- Maximum of 120 simultaneous line calls;
- Serial port support for baud rates from 1,200 to 19,200;
- TCM pass-through for support of a Norstar station set on the same TCM loop;
- Reduction of hardware requirements to conform with industry standard cable connections;
- LED status indicator.

Target Audience

Companies interested in gathering telephone activity data to monitor and manage their Norstar system will find SMDR beneficial. SMDR provides a simple billing process with account codes. System Administrators can review SMDR call data to develop practical call management procedures to minimize call problems.

Voice Mail Interface (VMI)



Software

Compact ICS, any release	✓
Modular ICS, any release	✓
3x8 DR5	✓
DR1 (3x8, 6x16, 8x24)	✓
Compact DR2	✓
Compact DR5	✓
Compact DR5-DS	✓
Modular DR2	✓
Modular DR3	✓
Modular DR4	✓
Modular DR5	✓
Centrex, CTX+	✓

Description

The Voice Mail Interface (VMI) allows the connection of a stand alone third party auto attendant/voice mail system to a Norstar (DR2 or higher). Each VMI supports two AA/VM ports and uses two station ports on the Norstar. The VMI provides three basic functions of third party integration:

- Forward to personal greeting,
- Return to operator,
- Message notification on/off using the “Message for you” display on the Norstar set.

VMI has been tested successfully with five major AA/VM vendors:

- Octel,
- Centigram,
- VMX,
- Active Voice (Repartee),
- AVT (Call Express).

The VMI is generally available in the US only. Contact your AA/VM vendor for compatibility and specific application information.

Norstar Integrated Voice and Data

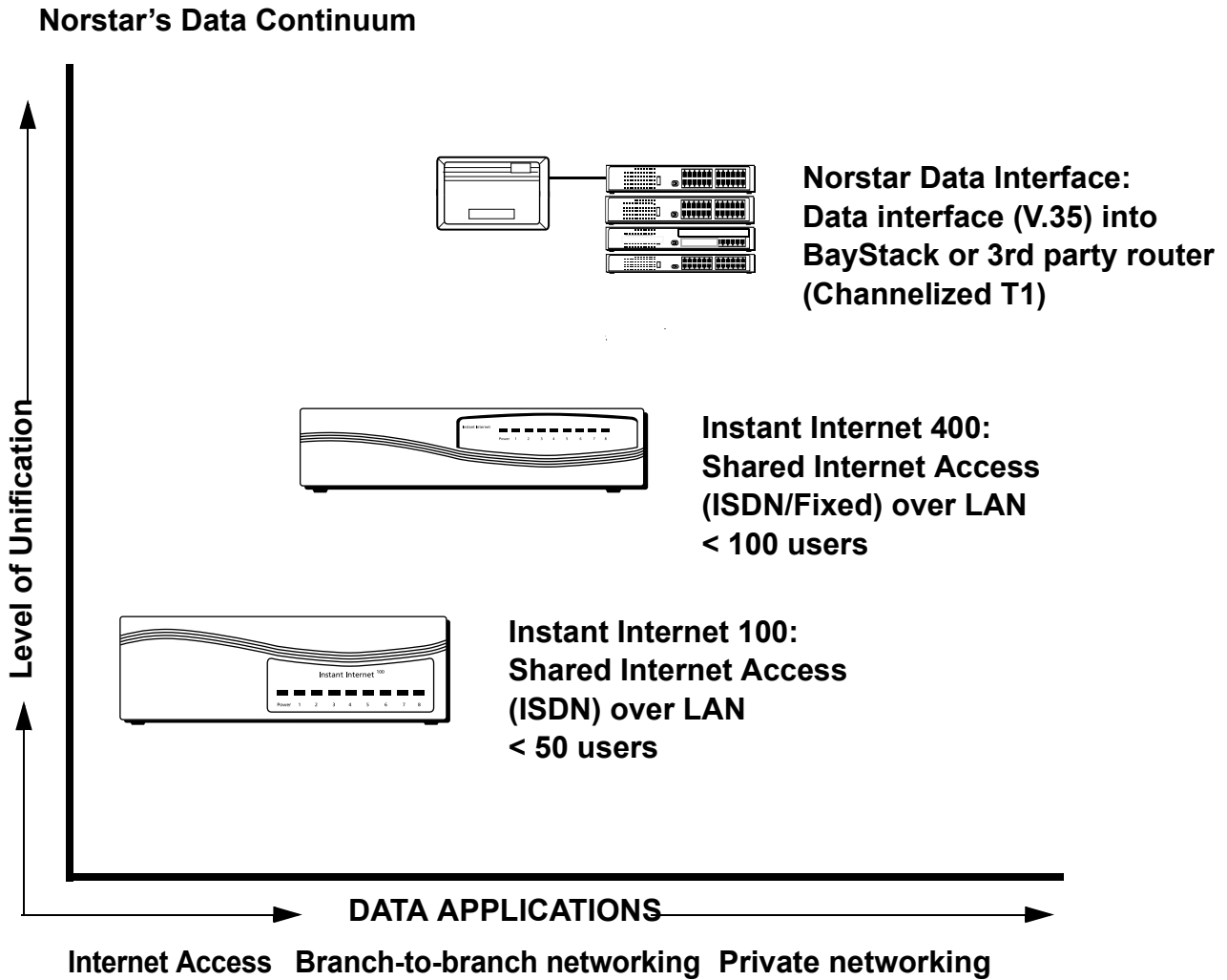
Introduction

In 2001, no business can really be considered stand-alone. Although the legal Enterprise may only have one physical location, it likely has employees, business partners, suppliers and customers that it needs to be electronically connected with. The Internet is fast emerging as the most common and cost-effective means to achieve results through the use of business tools such as e-mail, web sites and e-commerce.

The Internet is an integral part of increased productivity in today's business environment. Small and medium-sized enterprises are looking for a fast, easy way to connect to the Internet, and the tools to handle the increased traffic from Internet applications rich in graphical content. There is a booming market for universal, secure, cost-effective IP connectivity for small and medium enterprise LANs.

Nortel Networks offers a complete range of voice and data networking options for Norstar customers. The BayStack family of high-performance Ethernet solutions from Nortel Networks offers a comprehensive, scalable suite of products that allow customers to build a network that will grow with their business, delivering the capabilities and performance they require to keep pace with increasing demands.

- The range of products from the Instant Internet 100 to the Instant Internet 400 provides flexibility to address growing bandwidth requirements. The Instant Internet 100, supporting ISDN, analog and xDSL connectivity, provides a solution for the lower-bandwidth customer. The Instant Internet 400, supporting ISDN, analog, xDSL, T1 and v.35 connectivity, is aimed at customers with higher bandwidth requirements.
- The addition of the BayStack 255 24-port hub and the 350 12T and 24T BayStack switches, provides the components to address the non-LAN customer or the customer with specific bandwidth needs.
- The BayStack 60 Hubs and the BayStack 70 Switches provide affordable, reliable and flexible connectivity for growing networks and are perfect for cost-conscious customers who don't need complicated management features.
- The new Norstar Data Interface (NDI) allows small sites to easily connect a Nortel Networks or 3rd party Data Terminal Equipment device (for example, router) to the Modular ICS 4.1 system, and benefit from the savings of consolidated network services (Universal or channelized T1s).



The current Norstar Data Portfolio provides the CTA 200, the Instant Internet products and the new Norstar Data Interface.

The Instant Internet portfolio addresses Internet access requirements – shared access over a company’s LAN. The Instant Internet provides flexibility to address the changing bandwidth requirements of the customers. The Instant Internet 100, supporting ISDN, analog and xDSL connectivity, targets the low-bandwidth customer. The Instant Internet 400, supporting ISDN, analog, xDSL, T1 and V.35 (via the Norstar Data Interface) connectivity, targets the customer with higher bandwidth requirements.

The New Norstar Data Interface evolves the Norstar’s Data Portfolio with its unparalleled integration and support for Nortel Networks (BayStack, etc.) and 3rd party DTE (routers, Internet access devices, video conference units, etc.). Modular ICS customers can establish a robust and complex Corporate/Private Network via the capability of the Norstar Data Interface to transparently hand dedicated bandwidth to any DTE that supports open standard synchronous protocols (V.35, RS-232, EIA-530, EIA –530A, RS-449).

Choosing the Right Solution

Number of users at site	Are computers networked?	They need...	For Internet Access they need...	Suggested access line
25 or less	No	255 Hub	Instant Internet 100	Analog, xDSL or ISDN
	Yes	n/a		
26 to 50	No	255 Hub	Instant Internet 100 or 400	Analog, xDSL or ISDN
	Yes	n/a		
51 to 100	Yes	350 Switch to improve network performance	Instant Internet 100 or 400	xDSL, ISDN or leased line
101 to 150	Yes	350 Switch to improve network performance	Instant Internet 400	xDSL, ISDN or leased line

Customer Profile

The key target market segments for the Instant Internet will be the small to medium-sized businesses that Norstar has traditionally addressed with voice solutions. Customers will be either new Compact ICS and Modular ICS sites, existing sites requiring new voice and data communications, or Norstar sites requiring data networking solutions.

Potential customers are any small site (100 employees or less) business requiring secure and reliable high-speed LAN-based shared access to the Internet, and the best fit will be in the small site stand-alone market.

This solution will also have appeal for the lower end of the small site Hybrid market (multi-site enterprise with fewer than 100 sites). The customers will be small to medium LAN-equipped businesses that have either analog, xDSL, ISDN, T1 or V.35 connectivity requirements. Non-LAN customers can also be supported with the addition of the BayStack 255 Hub and the BayStack 350 Switch.

- *Instant Internet 100* is great for small workgroups (typically 50 users) that will use analog xDSL, or ISDN telephone lines for Internet access.
- *Instant Internet 400* handles the special challenges facing larger organizations' networks (typically 100 users) that will use either analog, ISDN, xDSL, T1 or V.35 for Internet access. The Instant Internet 400 also provides Web-caching, which may be a requirement in larger organizations with special access requirements, such as education facilities.
- For the LAN or non-LAN customer, the BayStack 255 24-port 10/100 autosense hub provides workgroups with a cost-effective way to connect both 10 Mbps ethernet and 100 Mbps Fast Ethernet computers together.
- For the LAN customer with higher or increasing bandwidth requirements the BayStack 350 12T or 24T switch supports the need to segment the LAN into smaller collision domains to improve performance, or where desktop switching is being introduced for small groups of power users.

- The BayStack 60 Hubs and the BayStack 70 Switches provide affordable, reliable and flexible connectivity for growing networks and are perfect for cost-conscious customers who don't need complicated management features.

The Norstar Data Interface (NDI) was developed for those small to medium sized enterprises that wish to integrate their Modular ICS with a new or existing Nortel Networks router, or 3rd party Data Terminal Equipment device such as a Cisco or 3Com router, or a V-Tel or Picture-Tel unit.

Benefits

Small site users that wish to acquire enhanced capabilities normally associated with larger sites, and due to their typical size and voice / data needs, may be able to take advantage of service and equipment consolidation represented by integrated solutions. An integrated system would enable all the capabilities users are expecting from their voice and data networks. Data applications might include Internet / Intranet, e-mail, e-commerce, video conferencing, file transfers and collaboration, and voice capabilities would include in/out calling features, networking, voice mail, ACD, and CTI.

The key difference from existing separate voice and data networks is how this is all accomplished—via a single system, which reduces the complexities and costs of procuring, installing and operating separate voice and data systems and components and delivers the benefits of “one-stop shopping” and unified network and system management.

Quick company-wide Internet access and literacy

With LAN access, an entire company can gain Internet access with a single connection. The clear and simple techniques, which are available through browsers and e-mail, can quickly spread Internet literacy throughout PC users, and with it, the prospects of significant productivity improvements.

Cost savings

Internet connection through the PC LAN allows the entire PC user base to access the Internet through a single connection without individual accounts and without individual modems. Due to the bursty nature of Internet access, satisfactory Internet access performance can be had with several simultaneous users through a single connection, reducing the need for dedicated single user access with dedicated modems and network connections.

Customers can realize substantial cost reduction when purchasing their voice and data CPE equipment, making the shift from many separate boxes from several suppliers, into a single product solution from one supplier. The consolidation of CPE reduces the data provisioning costs at each small site for separate FRAD/MUX/Router/Bridge/Hub products.

Significant monthly cost savings can also result from access consolidation for WAN voice and data over PSTN and IP network services, from separately provisioned and terminated Local Access facilities to a single T1 Network Access. This consolidation reduces the number of facilities needed for voice lines and for data access down to one T1, resulting in a considerable monthly savings per site.

Customers can receive ongoing maintenance cost savings from the ability to simplify remote site management of voice and data infrastructure, and from consolidating multiple maintenance contracts into one.

Internet access products

The BayStack Instant Internet products are complete Internet connectivity solutions designed to connect an entire network to the Internet quickly and easily. Choose either the Instant Internet 100 or the Instant Internet 400, depending on customer bandwidth needs and number of users. All of the award-winning software features are common to both Instant Internet units.

Access policy control

Because the Internet access for the entire company flows through a single point, that funnel can serve to control access to the Internet. Policies can be enforced that take into account the PC user, the time of day, the destination, the services obtained. Referencing by whole groups at a time can greatly reduce the administrative burden compared to administering each individual separately.

Audit logging

The same funnel that provides Internet access control can also produce an audit of the Internet access of the company. This will provide a valuable tool to administrators to verify that Internet access is properly used.

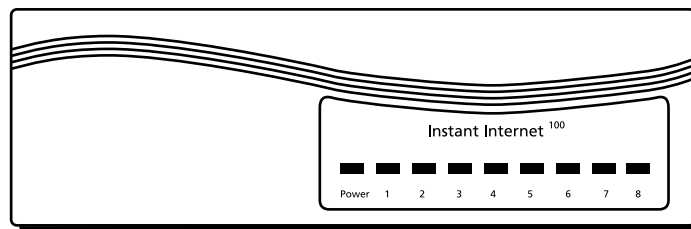
Undisrupted Installation

Instant Internet installs in minutes with no LAN downtime and no disruption to the network using a single IP address, while also supporting IP, IPX or mixed LAN environments.

Investment Protection/Cost of ownership

As business needs change and expand, the BayStack Instant Internet portfolio will accommodate these changes with the flexibility and scalability offered in easy migration paths from Instant Internet 100 to 400 and the ability to stack hubs and switches.

Instant Internet 100

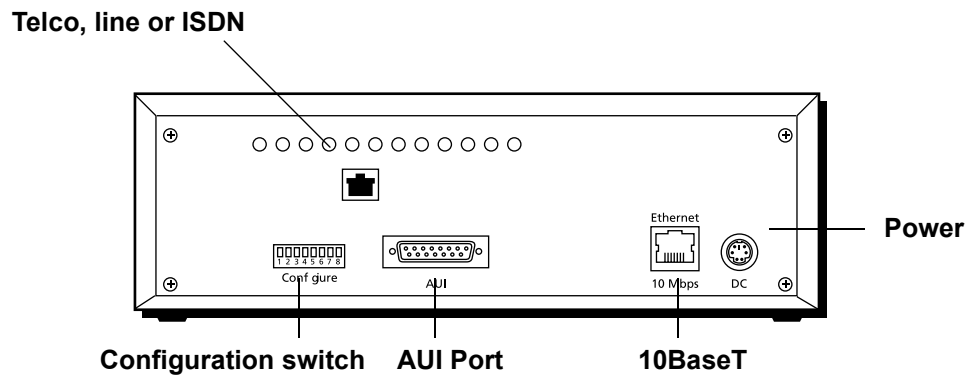


The Instant Internet 100 is targeted at the small 10BASE-T LAN customer, typically supporting 50 users. The Instant Internet 100 resides in a small 2 lb. chassis with front panel LED display for troubleshooting.

Easy installation

There are only 3 connections – the Ethernet network cable, power cable and phone line (analog, xDSL or ISDN). The rest of the setup takes place across the LAN in seconds from any existing workstation. There's no need to shut down or reconfigure the network. Connection to the company ISP is provided from a pull-down menu of hundreds of ISPs – customers select their provider, and enter the user ID, password and telephone number provided by the ISP. Only one IP address is required for the entire LAN.

Rear view of the Instant Internet 100



Connectivity options

The Instant Internet 100 supports analog (V.90), xDSL and ISDN connections over 10Base-T Ethernet.

For IP, IPX, or mixed LAN environments

Instant Internet allows users to IP-only LANs to immediately begin accessing the Internet without changing their workstation or the network router configuration. Even subnetted intranets won't have to be changed or disrupted – no matter what the IP address scheme and whether or not it is involved in an existing WAN. For IPX-only LANs, users can access the Internet from anywhere on the network without adding IP to their workstations. They won't have to reconfigure, reboot, or stop existing applications during the installation. For networks migrating from IPX to IP, Instant Internet provides a smooth transition serving both IP and IPX users simultaneously.

Turnkey access solution

Instant Internet comes complete with a browser, news reader, e-mail, terminal emulator, and file transfer applications that are licensed for every LAN workstation:

- NetScape Communicator;
- E-mail, FTP client, News Reader;
- AniTa (terminal emulator).

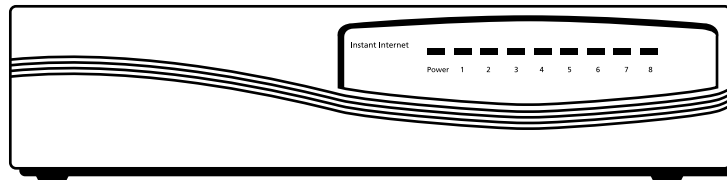
Security

The Instant Internet is equipped with a built-in firewall consisting of five proxy systems (HTTP, SOCKS, IPX-WINSOCK, NAT, and DNS) that can be used singly or in combination. In the typical client-access mode, Instant Internet appears as a single IP address to the Internet and blocks all other Internet packets from entering the network. Essentially, the private LAN becomes invisible to the Internet and virtually “unhackable”.

Management tools

Instant Internet makes it easy for businesses and schools to control user Internet access. Instant Internet automatically imports user and group information from existing NT and NetWare directories (all versions of NetWare). Employee Internet access can be controlled by a wide range of parameters including time of day, day of week, application (port#), and domain name. Newsgroups can be controlled by key words in the heading. Sophisticated logging tools reveal each time-stamped entry and shows who went where and what application was used. All of this information is in a file that can be printed or imported into Excel or a database. Metering permits the billing of Internet access costs to departments based upon usage.

Instant Internet 400



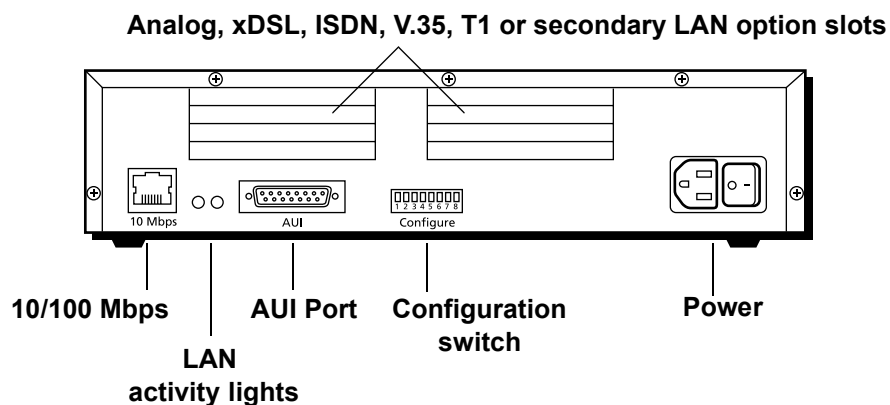
The Instant Internet 400 is targeted to the small-medium-large business, dependent upon bandwidth requirements, and typically supports 100 users. The Instant Internet 400 resides in a 13 lb. chassis, with front panel LED display for troubleshooting.

In addition to the expanded connectivity options of the Instant Internet 400, (xDSL, T1, V.35) the Instant Internet 400 offers 64MB of Web caching support over 10/100BASE-T.

Easy installation

There are only 3 connections – the Ethernet network cable, power cable and phone line (analog, xDSL, T1, V.35 or ISDN). The rest of the setup takes place across the LAN in seconds from any existing workstation. There's no need to shut down or reconfigure the network. Connection to the company ISP is provided from a pull-down menu of hundreds of ISPs – customers select their provider, and enter the user ID, password and telephone number provided by the ISP. Only one IP address is required for the entire LAN. Even configuring a T1 typically requires only 5 or 6 entries.

Rear view of the Instant Internet 400



Web caching

The Instant Internet 400, with its 64MB of cache RAM, can increase the apparent bandwidth to the Internet. When users frequently access the same web sites repeatedly, caching can supply many accessed Web pages directly from the locally stored cache. For example, an entire school classroom of PCs can access a cached common page in about the same time it takes to download it once. The Web cache support of the Instant Internet 400 can save bandwidth, time and money.

Instant Internet's transparent proxy protocol permits the use of a proxy cache without the ordinarily burdensome task of reconfiguring all workstation browsers. It can even link transparently to an external proxy cache.

Connectivity options

The Instant Internet 400 supports analog (V.90), xDSL, ISDN (built-in NT1), V.35 (via the Norstar Data Interface), and fractional or even full T1 (built-in CSU/DSU) as well as both autosensing 10/100 Ethernet and 4/16 Token Ring.

For IP, IPX, or mixed LAN environments

For IP-only LANs (Windows 3.x/95/98/NT, MAC, OS/2, Unix), users can immediately access the Internet without changing their workstation or the network router configuration. Even subnetted intranets won't have to be changed or disrupted. For IPX-only LANs (Novell NetWare), users can access the Internet from anywhere on the network without adding IP to their workstations. They won't have to reconfigure, reboot, or stop existing applications during the installation. For networks migrating from IPX to IP, Instant Internet provides a smooth transition serving both IP and IPX users simultaneously.

Security

The Instant Internet built-in firewall is equipped with five proxy systems (HTTP, SOCKS, IPX-WINSOCK, NAT, and DNS) that can be used singly or in combination. In the typical client-access mode, Instant Internet appears as a single IP address to the Internet and blocks all other Internet packets from entering the network. Essentially, the private LAN becomes invisible to the Internet.

Management tools

Instant Internet makes it easy for businesses and schools to control user Internet access. Instant Internet automatically imports user and group information from existing NT and NetWare directories (all versions of NetWare). You can control employee Internet access by a wide-range of parameters including time of day, day of week, application (port #), domain name, and more. Sophisticated logging tools reveal each time-stamped entry and shows who went where and what application was used. All of this information is in a file that can be printed or imported into Excel or a database. Remote management features allow the unit to be managed from anywhere.

Instant Internet Comparison Chart

	Instant Internet 100	Instant Internet 400
Internet Access	V.90, xDSL, 64/128K ISDN (with built-in NT1)	V.90, xDSL, 64/128K ISDN, V.35, T1 (with CSU/DSU)
Size of LAN	small	medium to large
Chassis	6.75 x 2.25 x 10.25 inches	15.5 x 3.5 x 17 inches
Topologies supported	10BASE-T Ethernet	10/100BASE-T Autosensing Ethernet, 4/16 Autosensing Token Ring (option)
Router support	Yes	Yes
Built-in Firewall	Yes	Yes
Management tools	Yes	Yes
Clients supported	IP, IPX, or a mix of both	IP, IPX, or a mix of both
NAT support	Yes	Yes
DHCP support	Yes	Yes
Web Caching	No	Yes

Norstar Instant Internet Scenarios

Customer Dilemma

Many companies today would like to minimize their communications costs by optimizing their current trunk usage while maintaining high quality voice and data connections to the global community. However, many companies are forced to dedicate circuits for voice and data communications, incurring these higher costs to keep pace with the global market or finding themselves in a less competitive position by choosing to do without.

The Norstar Solution

Norstar has an integrated voice and data solution that gives companies the power to stay competitive in the global market place while minimizing their investment in separate voice and data circuitry.

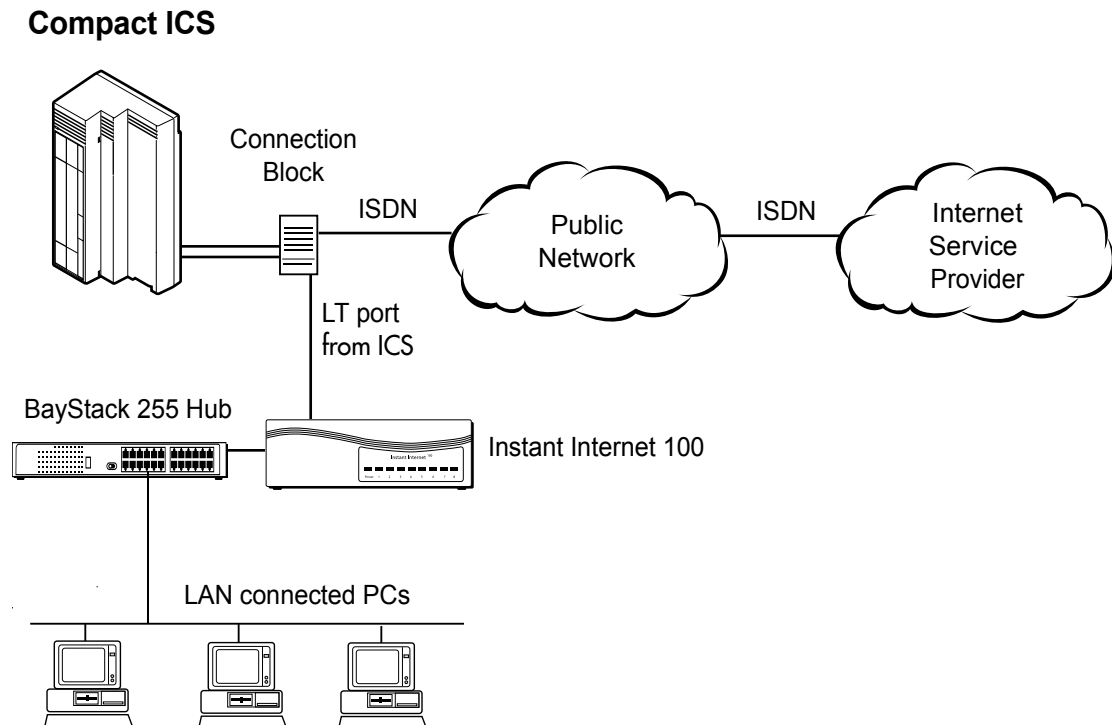
The Instant Internet 100 and the Instant Internet 400 allow high-speed digital communication between the customer's LAN and an Internet Service Provider. Customers can consolidate their voice and data traffic through a single gateway, which can offer significant cost savings compared to dedicated voice and data lines.

The following scenarios provide a high-level illustration of a Norstar using the Instant Internet for high-speed connectivity of their existing LAN with the Internet, providing cost effective shared user access for their knowledge workers.

Compact ICS with Internet Access

The following illustration is a high level view of an Instant Internet 100 connected to a LAN via a Bay Stack 255 Hub, and connected to the Compact ICS through a station side ISDN port. This can be accomplished with either 2-or 4-port BRI cards on the Compact ICS.

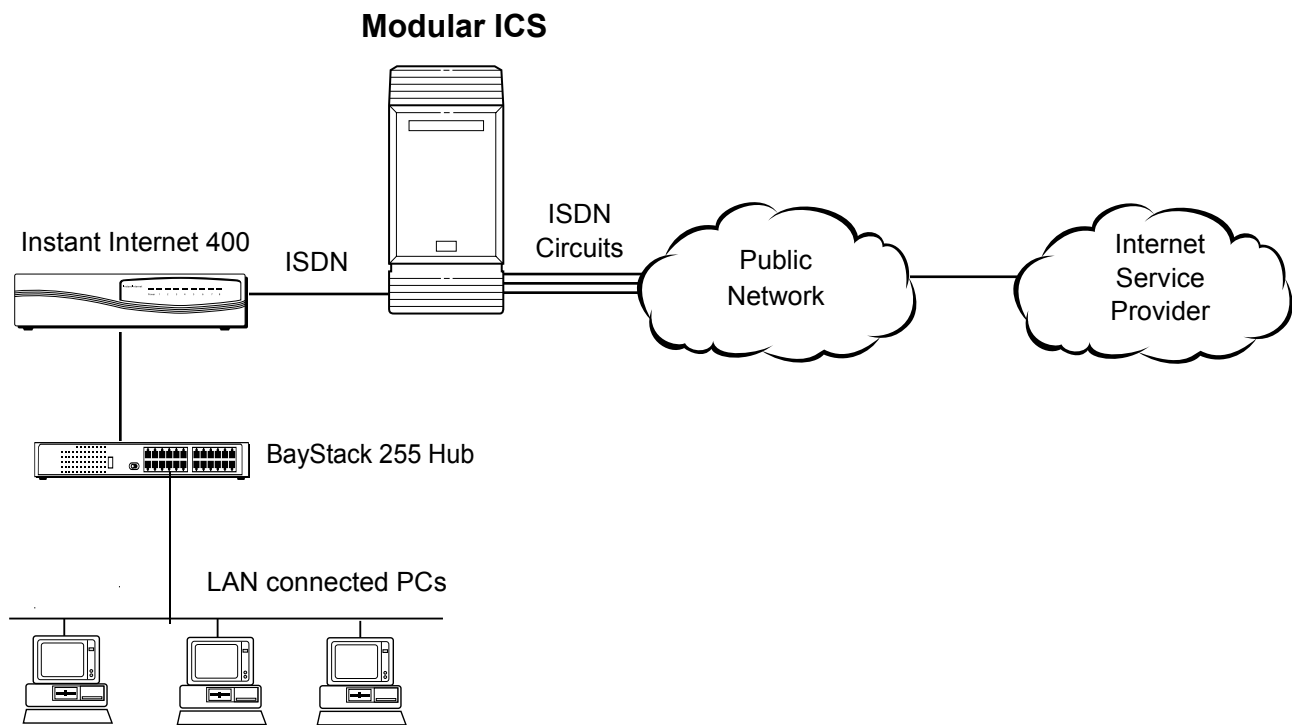
The Compact ICS acts as the voice and data gateway to the world, providing voice connections as well as connecting the LAN users to the Internet Service Provider through the Instant Internet 100. The Bay Stack 255 Hub provides LAN connectivity for workstations.



Modular ICS with Internet Access via BRI

The following illustration is a high level view of an Instant Internet 400 connected to a LAN via a Bay Stack 255 Hub, and connected to the Modular ICS through a station side ISDN port. This can be accomplished with either 2-or 4-port BRI cards on the Modular ICS. The Modular ICS can have either BRI or PRI circuits to the PSTN.

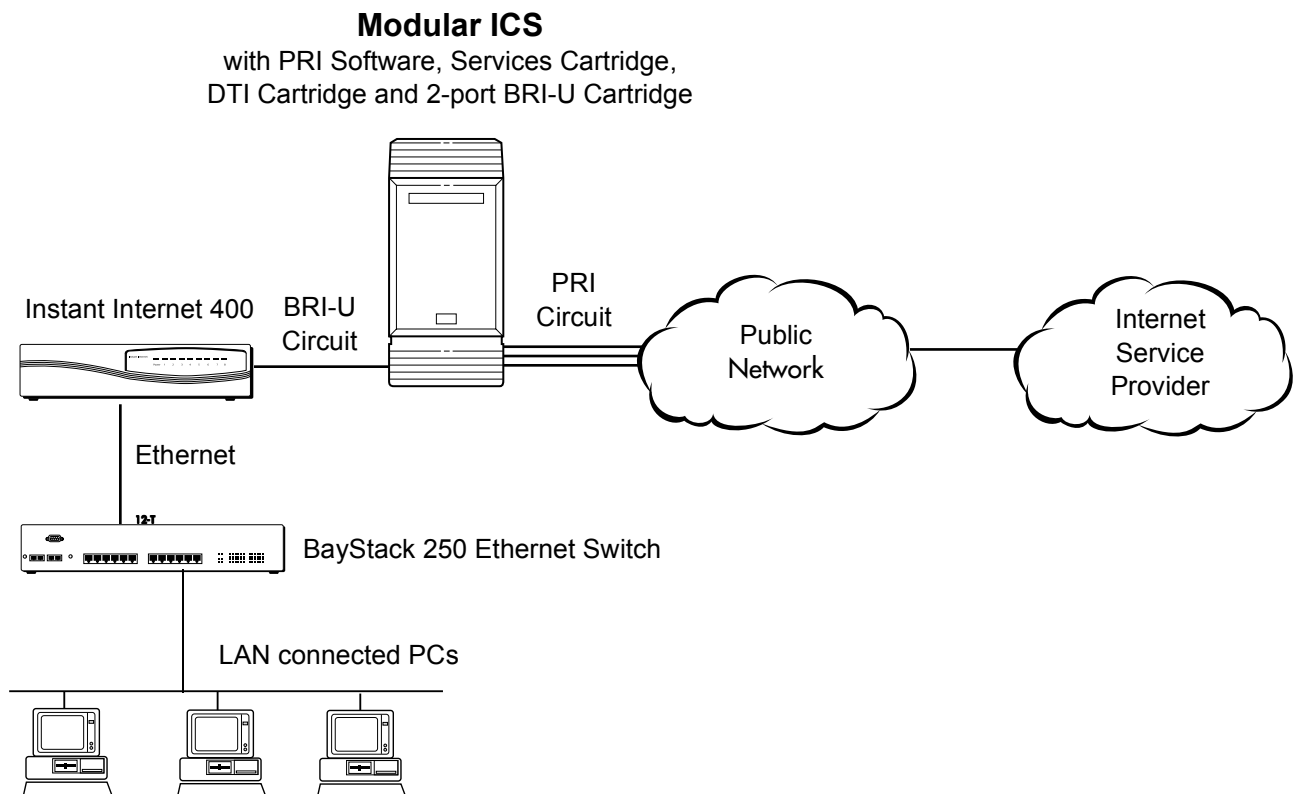
The Modular ICS acts as the voice and data gateway to the world, providing voice connections as well as connecting the LAN users to the Internet Service Provider through the Instant Internet 400. The Bay Stack 255 Hub provides LAN connectivity for workstations.



Modular ICS with Internet Access via PRI

The following illustration is a high level view of an Instant Internet 400 connected to a LAN via a Bay Stack 350 Ethernet Switch, and connected to the Modular ICS through a station side ISDN port. This can be accomplished with either 2-or 4-port BRI cards on the Modular ICS. The Modular ICS can have either BRI or PRI circuits to the PSTN.

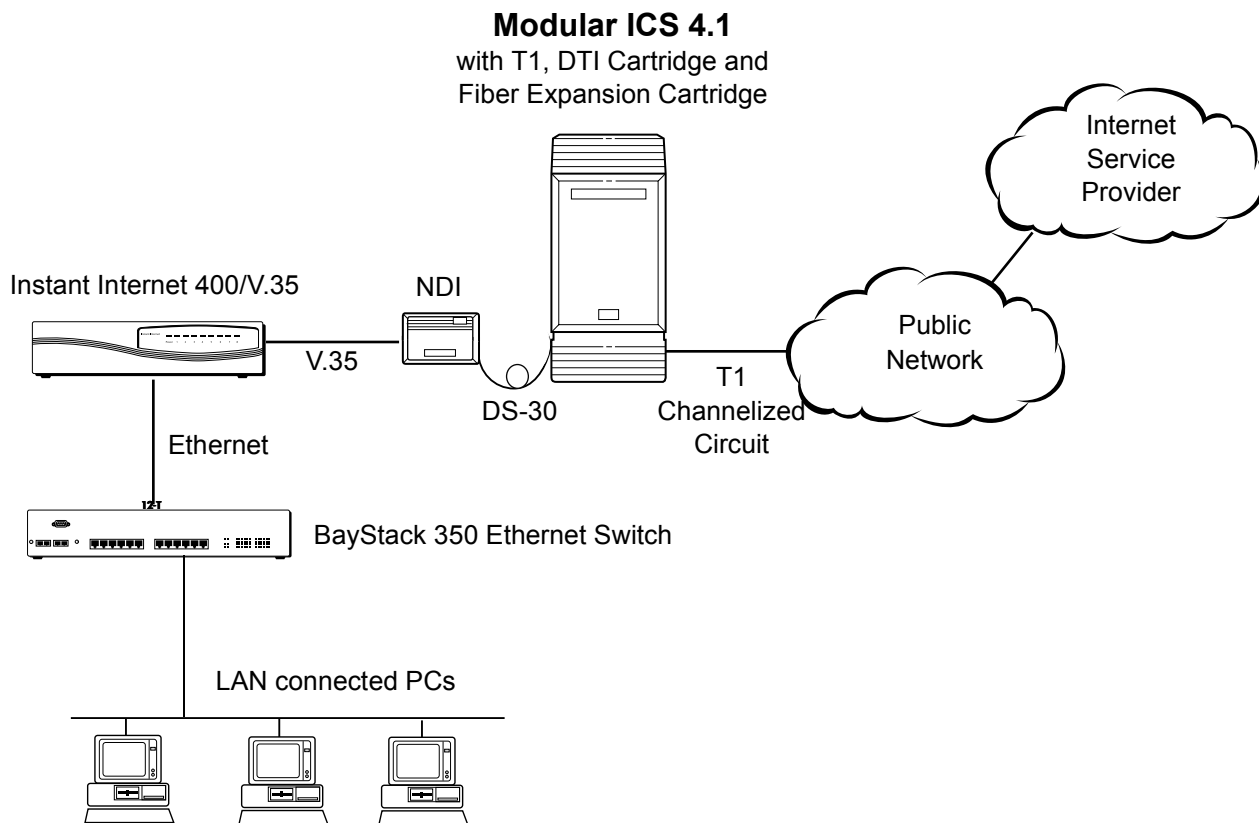
The Modular ICS acts as the voice and data gateway to the world, providing voice connections as well as connecting the LAN users to the Internet Service Provider through the Instant Internet 400. The Bay Stack 350 Ethernet Switch provides high performance LAN connectivity for workstations.



Modular ICS with Internet Access via V.35

The following illustration is a high level view of an Instant Internet 400 connected to a LAN via a Bay Stack 350 Ethernet Switch, and connected to the Modular ICS through Norstar Data Interface, V.35 connection. This type of connection provides greater bandwidth through the Modular ICS for the LAN traffic (ISP bound).

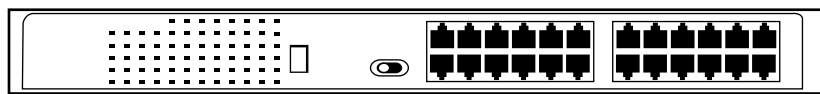
The Modular ICS acts as the voice and data gateway to the world, providing voice connections as well as connecting the LAN users to the Internet Service Provider through the Instant Internet 400 and the NDI. The Bay Stack 350 Ethernet Switch provides high performance LAN connectivity for workstations.



LAN infrastructure products

The BayStack LAN infrastructure products provide a scalable solution to building network architecture that will grow with the business, delivering the capabilities and performance needed to keep pace with increasing demands.

BayStack 255 24-Port Ethernet Hub



Stackable hubs provide scalable, cost-effective solutions for supporting rapidly expanding networks. By simply adding new hubs to an existing stack, customers can increase port density to support more users—without sacrificing their initial investment.

The BayStack Ethernet 255 24-port Autosense Hub is targeted to the customer with a growing LAN and the need to connect both 10 Mbps Ethernet and 100 Mbps Fast Ethernet computers together, or for the non-LAN customer to create initial LAN workstation connectivity.

Additional hubs are easily added to support a growing network. Power users and high-bandwidth workgroups receive the bandwidth they need, and Fast Ethernet server uplinks remove potential network bottlenecks.

The BayStack Ethernet 255 Autosense Hub supports 10BaseT/100Base-TX Ethernet connectivity. The hub supports 10/100Mbps autosensing on all ports, enabling seamless migration from 10 to 100 Mbps connections automatically and transparently. 100 Mbps workstations and workgroups can therefore be brought on-line without the expense and downtime caused by reconfiguring the wiring closet.

This means that when the Network Interface Card (NIC) of a PC is upgraded from 10 to 100 Mbps, the BayStack 255 hub automatically detects this change and operates at the higher speed and all ports automatically detect and support the speed of a connected device, whether it is a 10 Mbps printer or a 100 Mbps power user's computer.

Built-in two-port switch

The two-port switch, built into the BayStack 255 Hub, allows for better performance through segmentation and provides high-speed connectivity between 10 Mbps users and 100 Mbps users.

Expandability and Easy Installation

Up to five hubs can be stacked. A single management hub can also be added for 120 ports of managed 10/100 Mbps Autosense connectivity. The hub unit features a slim profile to allow high density with less rack space. Installation is quick and easy with plug-and-play simplicity.

High-speed fiber connectivity

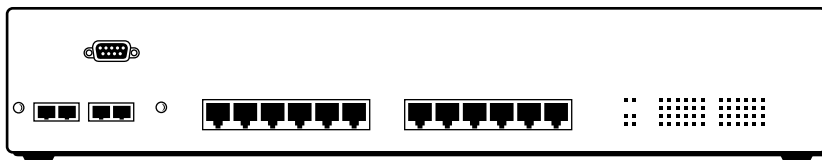
The BayStack 250-1FX one-port 100BASE-FX Media Dependant Adapter (MDA) for the BayStack 255 Hub provides high-speed, long-distance connection to the network center.

BayStack 350 12-T and 24-T Ethernet switches

High-performance workstations and applications can stretch the bandwidth of a workgroup to the limit. As the network grows, performance suffers as users compete for a fixed amount of bandwidth. Adding a BayStack Ethernet switch provides a simple way to relieve data bottlenecks by dividing growing networks into smaller, more manageable segments, dramatically improving performance as users are provided with dedicated bandwidth.

350 12-T and 24-T Ethernet switches

12-T



24-T



The BayStack 350-12T and 350-24T switches (12- and 24-port) are high performance, stand-alone switches that feature 10/100 autosensing technology on all RJ-45 ports. These switches enable seamless migration from 10 Mbps Ethernet to 100 Mbps Fast Ethernet, recognizing whether attached devices operate at 10 or 100 Mbps, half or full duplex and then setting their ports for the fastest appropriate speed and mode – automatically.

For medium-sized networks, BayStack 350 Switches provide Fast Ethernet at 10 times the speed of traditional 10 Mbps Ethernet. Fast Ethernet links are ideal for connecting servers and users into more productive workgroups. BayStack 350 Switches also support Gigabit Ethernet uplink ports, which are designed to deliver lightning-fast 1000 Mbps LAN speeds for connections to the network center or mission-critical application servers.

Nortel Networks BayStack 60 Hubs and BayStack 70 Switches

The BayStack 60 Hubs and BayStack 70 Switches have been added to the Norstar portfolio effective December 15, 1999. The BayStack 60 Hubs and BayStack 70 Switches appear in the April 17, 2000 edition of the US and Canadian Norstar Product Catalogs. Prior to the catalogue publication, these items can be ordered through the standard Norstar process using order codes.

The BayStack 60 Hubs and the BayStack 70 Switches provide affordable, reliable and flexible connectivity for growing networks and are perfect for cost-conscious customers who don't need complicated management features. The addition of the BayStack 60 Hubs and BayStack 70 Switches will provide opportunities to better address the cost-sensitive needs of the smaller customer.

BayStack 60 Hubs

The BayStack 60 Hubs provide 10/100 Autosensing on every port with internal switching between the 10Base-T and 100Base-TX segments. The BayStack 60 Hubs deliver per-port auto-partitioning. Autopartitioning is important in protecting your network from malfunctioning equipment that can slow down or stop traffic due to jabber, excessive consecutive collisions, or a single collision of excessive length.

Up to a maximum of two BayStack 60 Hubs can be connected in series with inexpensive straight-through unshielded twisted pair (UTP) cable via the front panel MDI/MDI-X port. The BayStack 60 Hubs come in both desktop and rack-mountable cabinets.

BayStack 70 Switches

The BayStack 70 Switches offer 10/100, Full and Half-Duplex autosensing on every port, automatically detecting the speed requirements of all ports and assigning port speed automatically. For customers who demand high-speed performance and scalability to support future needs, BayStack 70 Switches boost the performance of desktops by providing dedicated bandwidth directly to users and high utilization servers.

Up to a maximum of two BayStack 70 Switches can be connected in series with inexpensive straight-through unshielded twisted pair (UTP) cable via the front MDI/MDI-X port. The BayStack 70 Switches come in both desktop and rack-mountable cabinets.

Media Dependent Adapter (MDA)

Media Dependent Adapters overcome the 100 meter limit of ethernet wiring, extending this range when necessary. A typical application will be a large retail outlet, that likely has a switch residing at the front of the store, collecting input from cashier stations with the need to feed this input to the back office, which would be equipped with another switch. Most likely the distance between the front and back of the store will exceed the 100 meter range of Ethernet copper, therefore an MDA is needed at each switch.

Fiber (FX) MDAs

Fiber MDAs will provide a 2 km distance limit:

- BayStack 250-1FX 1 port 100Base-FX MDA,

- BayStack 400-2FX 2 port 100Base-FX MDA,
- BayStack 400-4FX 4 port 100Base-FX MDA.

Copper (TX) MDA

Copper MDAs will provide a 100m distance limit. Copper MDAs can be used when distance is not an issue, and will typically be used when creation of a centralized stack is required.

- BayStack 400-4TX 4 port 10Base-T/100Base-TX MDA.

Norstar Data Interface

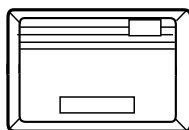
The Norstar Data Interface (NDI) allows small sites to easily connect a Nortel Networks or 3rd party Data Terminal Equipment device (for example, router) to the Modular ICS 4.1 system. Small sites benefit from the savings of consolidated network services (ie: Universal or channelized T1s).

The NDI is an external peripheral that connects the Norstar Modular ICS 4.1 via any DS -30 fiber expansion port (including those reserved for Companion) to an external router or data terminal equipment using open synchronous serial interface standards (V.35,RS-232, EIA-530, EIA-530A, RS-449).

Physical Description

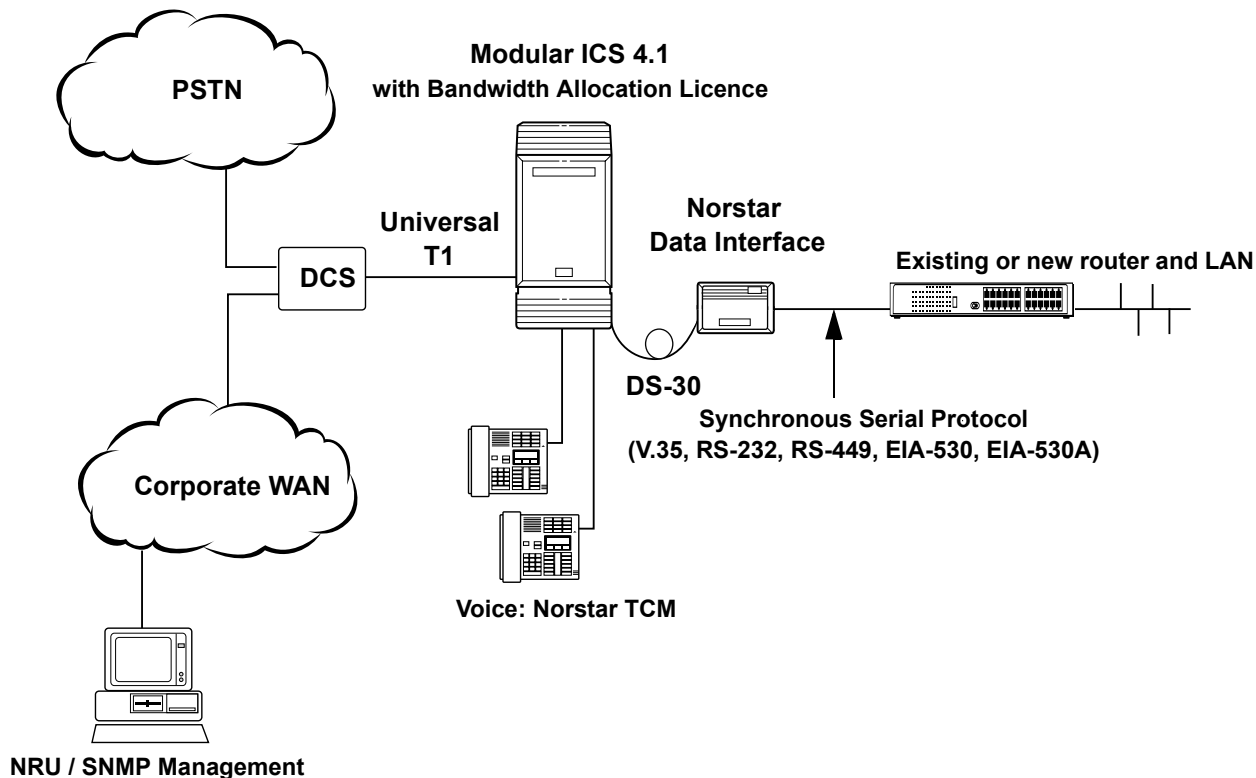
The NDI has three connectors on the back of the unit:

- A fiber connector for the ICS,
- A 26-pin D-sub-type connector (female) for the data device serial interface;
- A 2-pin, 2-conductor jack connector for the external 9Vdc power supply.



NDI weight: less than 11lb (0.4 kg).

Approximate dimensions: 170 mm x 140 mm x 40mm

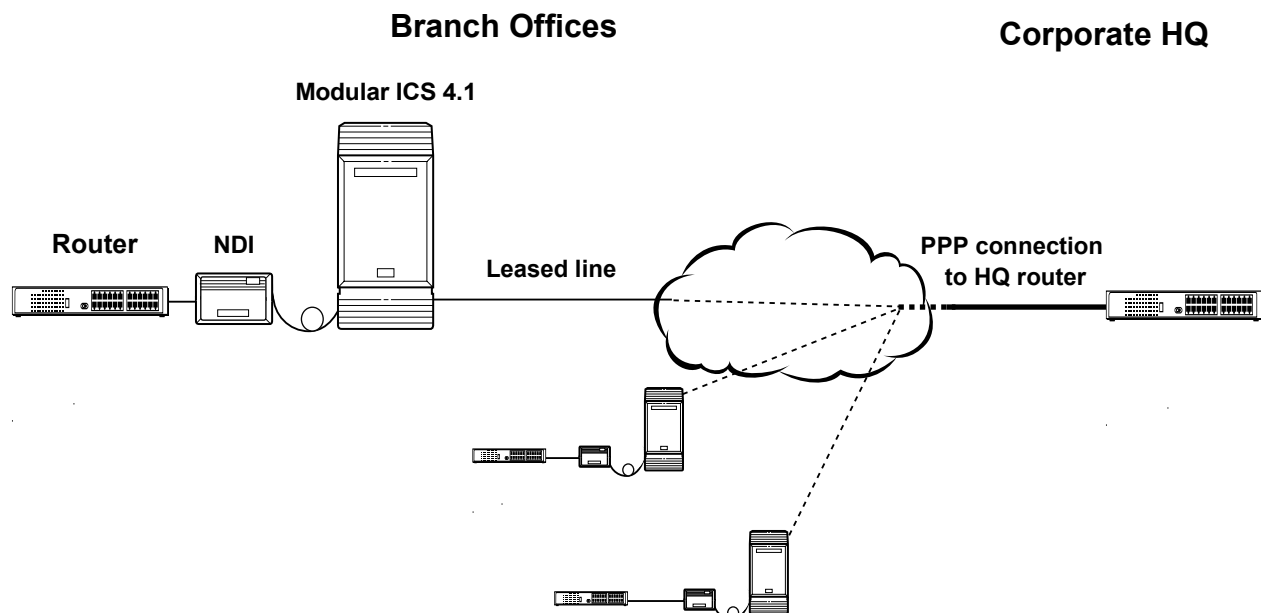


Typical applications

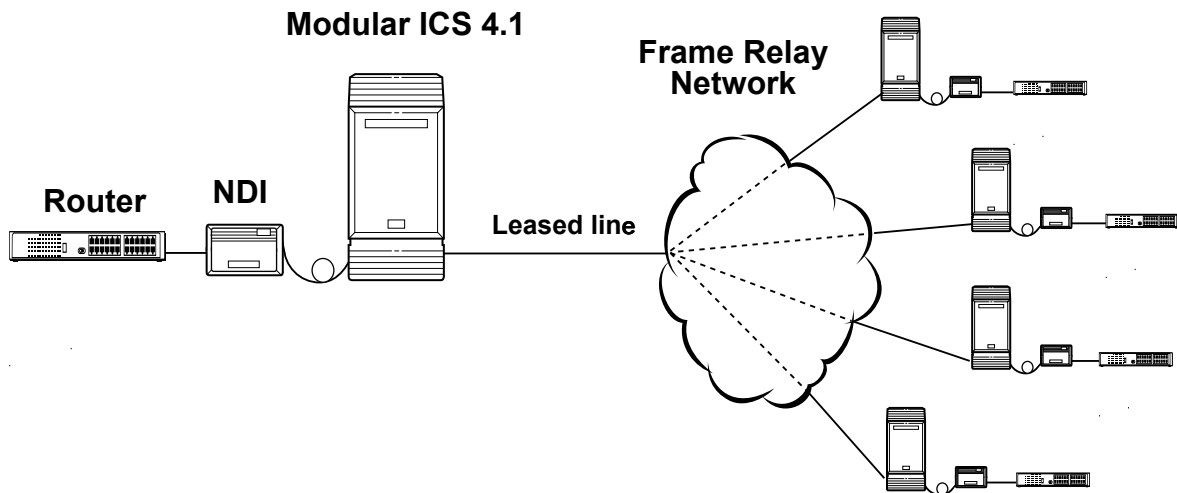
The NDI eliminates the need and cost of an external Channel Service Unit / Data Service Unit (CSU/DSU). A CSU/DSU is a hardware device about the size of an external modem that converts digital data frames from the communications technology used on a local area network (LAN) into frames appropriate to a wide-area network (WAN) and vice versa.

The CSU/DSU functionality is integrated in the Modular ICS 4.1 software and activated by the Bandwidth Allocation License. Having a built-in CSU/DSU lowers equipment costs, makes installation easier and eliminates the need for external cabling. The Modular ICS is effectively the Small Site Gateway and terminates all Universal or Channelized T1 WAN services and distributes the Voice and Data applications appropriately.

NDI enables a PPP connection from branch office router to HQ router



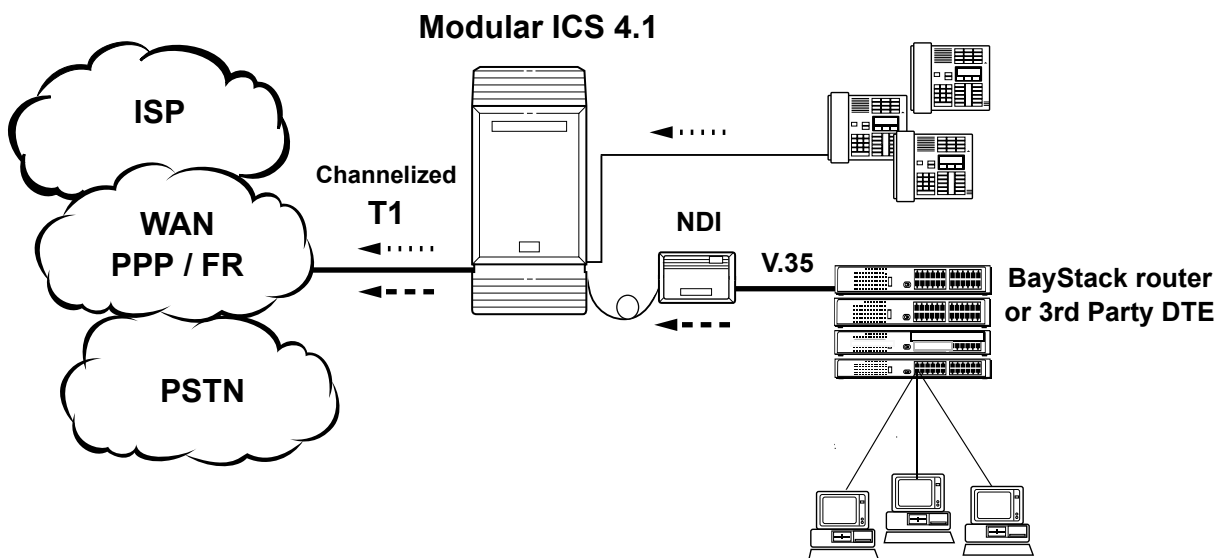
NDI facilitates one Frame Relay Interface with multiple PVCs to multiple far end routers



Networking examples

Consolidated Network Services (Universal / Channelized T1)

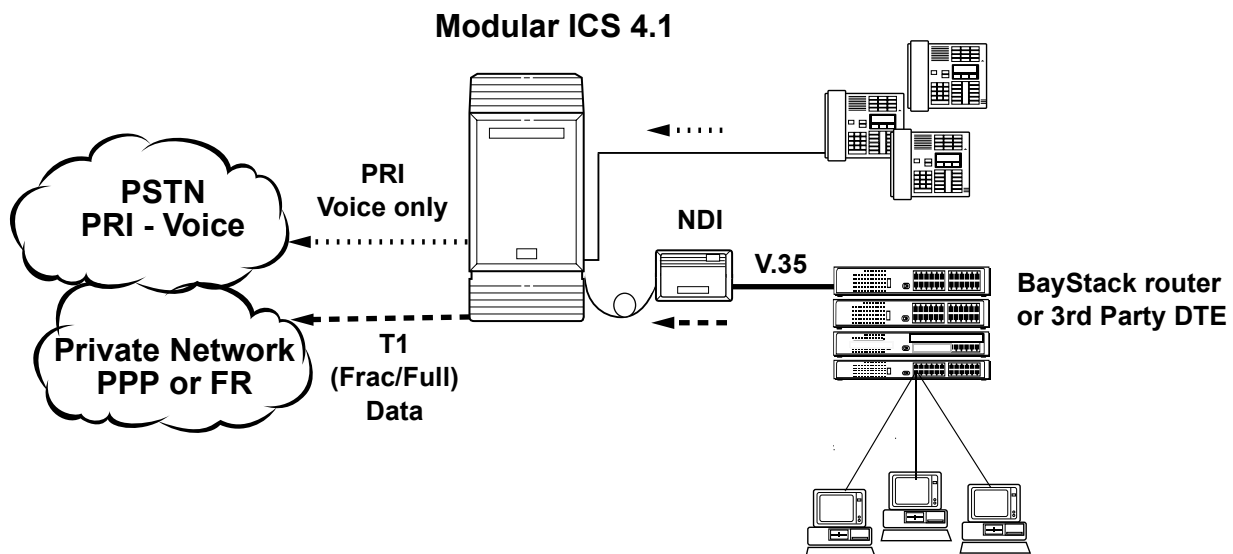
In this example a universal or channelized T1, carrying both dedicated datacom services and switched voice, terminates on the Modular ICS system.



- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of data services to the BayStack or 3rd Party router connected to the NDI via V.35.
- The router transparently pulls channels from the T1 through the Modular ICS for branch to branch networking and Internet access.
- The NDI facilitates clocking and connectivity services between the Modular ICS and the router.

Separate Voice and Data Services (PRI - voice and T1 - data)

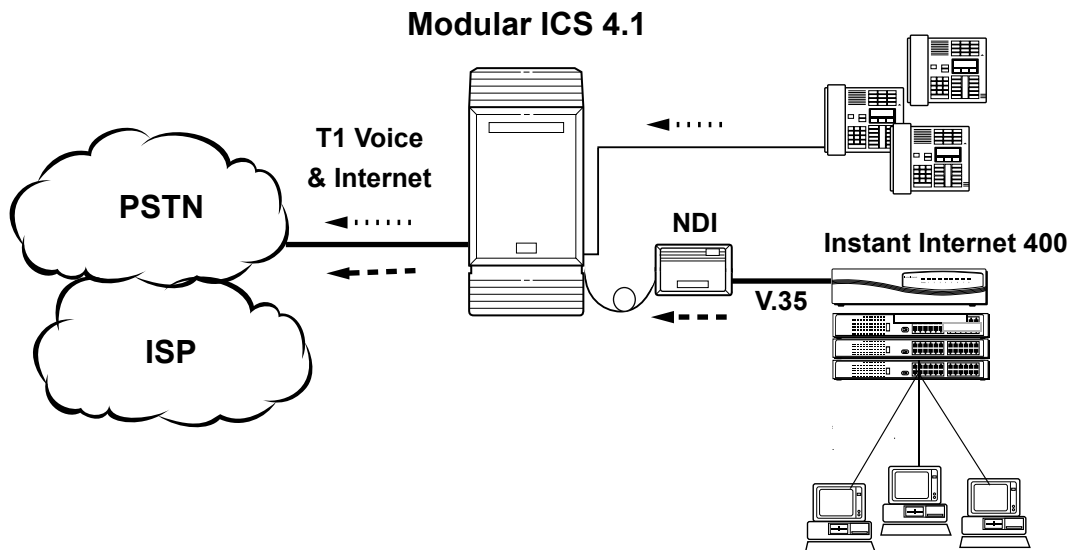
In this example a PRI line (Voice only) and a Frac/Full T1 (up to 1.544Mbps), carrying dedicated Point to Point or Frame Relay datacom services, terminate on two different DTI cards on the Modular ICS system.



- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of data services from the Frac/Full T1 to the BayStack or 3rd Party router connected to the NDI via V.35.
- The router transparently pulls channels from the T1 through the Modular ICS for branch to branch networking and Internet access.
- The NDI facilitates clocking and connectivity services between the Modular ICS and the router.

Consolidated Network Service (T1 - Voice and Internet)

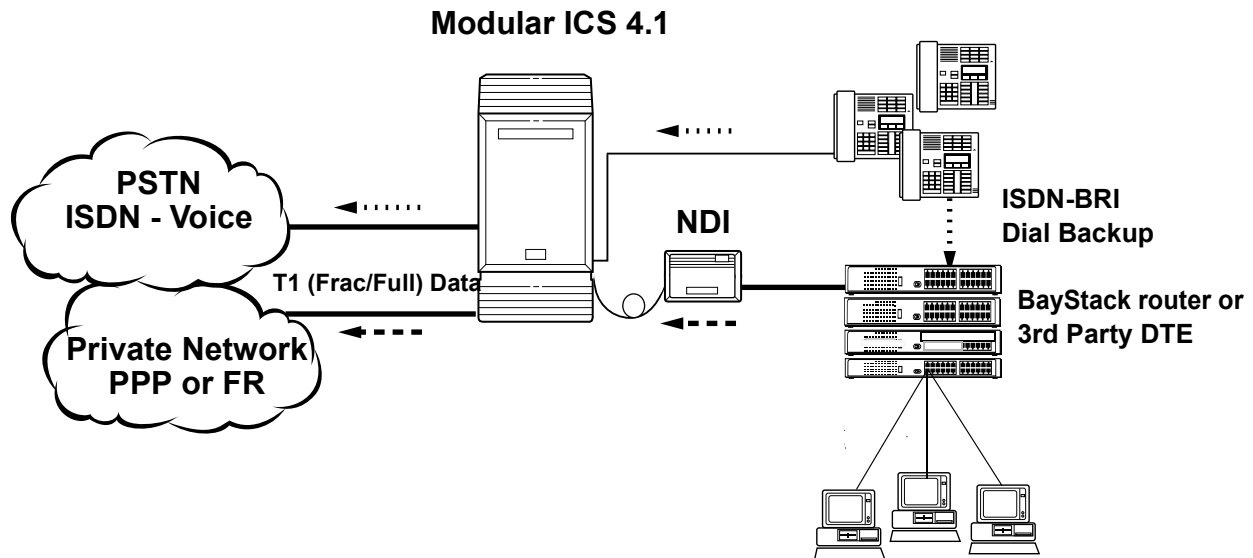
In this example a Universal / channelized T1, carrying voice services as well as Internet Services, terminates on the Modular ICS system.



- The Bandwidth Allocation License is installed and configured to pass up to 1.544 Mbps (Frac-Full T1) of Internet Services to the Nortel Networks Instant Internet 400 that connects to the NDI via V.35.
- The Internet 400 transparently pulls channels and Internet Services from the T1 through the Modular ICS, for corporate wide Internet access.
- The NDI facilitates clocking and connectivity services between the Modular ICS and the Instant Internet.

ISDN Backup in conjunction with NDI Fixed Access

In this example a BRI loop(s) connects from the Norstar Modular ICS and shares existing ISDN Network connections between voice and Data Terminal Equipment for BRI Dial Backup purposes. This can be done in conjunction with NDI Fixed Access to provide cost effective backup and redundancy.



- The NDI enables the Modular ICS system to share its connection to a Universal/Channelized T1 network with a local area network (LAN).
- The NDI allows you to make more efficient use of your corporate network resources, and consolidate the equipment needed to support your voice and data networks.

NDI Features

The Norstar Data Interface (NDI) is intended for the Modular ICS 4.1 platform where fiber ports are available and where T1/E1 is supported. The Modular ICS platform must be running Modular ICS DR/XC 4.1 or later release and have the Bandwidth Allocation License activated in order for the NDI to function properly.

NDI functionality

- Connection of a Data Terminal Equipment device that supports V.35, RS-232, EIA-530, EIA-530A, and RS-449 to the Norstar ICS via fiber cable (DS-30);
- Transparent bit transport service using nailed up T1 channels;
- Synchronous bit rates up to 2 Mbit/s;
- Configurable bit rates in increments of 56000 or 64000 bit/s;

- Option to inverse the data bits to meet density requirements;
- Transmit clock source selection and transmit clock inversion;
- Hardware flow control (CTS/RTS);
- Eight green LEDs to check or monitor status;
- Supports loopbacks between the NDI and the Modular ICS, and between the Data Terminal Equipment and the Modular ICS;
- Inverse MUX functionality to support a single PPP interface or a frame relay connection with multiple PVCs.

Transparent bit service

The NDI provides a transparent bit service and does not perform any link layer processing of the incoming bit stream. DTE devices communicate in a point-to-point fashion through the NDI. Consistent with commercially available CSU/DSUs, the NDI unit is not interpreting the bit stream.

Data Rates

The NDI supports data rates that are multiples of 56 Kbits/s or 64Kbits/s. This allows use of T1 service where clear channel service is not available. Maximum rates are 1536kbps for T1 and 1984kbps for E1.

The NDI generates the clock to the DTE device based on the selected bit rate. The clock will be synchronized with the Norstar ICS main system clock.

Bit Insertion/Extraction

When Nx56k data rates are selected, the NDI will insert a bit into the least significant bit of the NxDS30 channels used on the network interface. Conversely the appropriate bit will be removed on the incoming data stream.

When Nx56K data rates are selected, the unused bit can be used to represent the Data Carrier Detect (DCD) signal. This allows the near end data device to determine the state of the communication channel.

Data Inversion

Transmissions that adhere to the HDLC/SDLC protocol never include more than 6 consecutive ones. Thus, by inverting the HDLC data stream before routing it to the T1 network, the ones density requirements are met on the transmit path because the inverted signal will never contain more than six zeroes in a row. This allows the DS0s to carry data at a rate of 64000 bps with the use of AMI line coding, and requires the far end DTI (DCE) to convert the data back to its original form before it reaches the customer's equipment.

Similarly, incoming data that has been inverted at the source with the intention of meeting the ones density requirements of the T1 network must be inverted again before being sent to the DTE. This scheme is only applicable to data streams that use protocols such as HDLC.

When the Data Inversion bit is set, the NDI stream is inverted before being routed to the T1 network and the T1 network data destined for NDI is inverted before being sent to the DTE.

Transmit Clock Source Selection and Transmit Clock Inversion

The NDI provides a clock with the data it transmits to the router (DTE). This allows the router to synchronize with the NDI data stream. Similarly the router (DTE) provides a clock with the data it transmits to the NDI. This allows the NDI to synchronize with the router data stream. The clock generated by the router must be frequency locked to a signal provided by the NDI.

The NDI provides the option to use the clock generated by the router (DTE) or an internally generated clock signal to synchronize to the router data stream. The option to use the clock generated by the router is required when the connection between the NDI is long and/or noisy.

When the NDI is using an internally generated clock to synchronize to the router data stream, the option also exists to use an inverted version of the internally generated clock. This has the effect of delaying the sampling of data and can be used to compensate for a long connection between the NDI and router where the round trip delay exceeds one half-bit time.

The NDI also supports a mode where it will automatically select between using the clock generated by the router if it is present or where it will use the internally generated clock when the router clock is not present.

Loopbacks

The NDI provides a number of loopbacks to aid in testing, isolating, and diagnosing data transmission problems. Loopbacks include:

- Local DTE Loopback (towards DTE),
- DS30 Loopback,
- Remote Loopbacks. (The NDI does not support or respond to any form of remote loopbacks initiated by data or test equipment external to the Norstar ICS).

WAN Protocols

WAN protocols supported are based on the router or DTE connected to the NDI. The NDI transparently passes data communication services through as data traffic and ignores specific protocols. As long as the DTE can support a synchronous serial connection (V.35, RS-449, RS-232, EIA-530, EIA-530A) the NDI will facilitate a connection to the configured WAN services.

Components

In order for the NDI to function properly, the following components must be installed:

- Modular ICS 4.1 or later release with DTI card/s installed;
- Bandwidth Allocation License (BAL);
- NDI;
- NDI Connection Cable.

System Configuration and Compatibility

The NDI product is compatible with Modular ICS DR/XC 4.1 or later releases. A fiber expansion port must be available. The appropriate NDI connection cable into the DTE and the

Bandwidth Allocation License must be installed in order for the NDI to function properly. The NRU 8.1 or later release must be used to program or configure the NDI remotely.

The NDI is installed and configured as a data module on the Modular ICS. The Modular ICS must be programmed to recognize the NDI and Data Terminal Equipment.

Settings for the NDI can be programmed from any M7310 or M7324 two-line display telephone or from a personal computer connected to the Modular ICS and running Norstar Remote Utilities 8.1.

The NDI can be configured to use different cables to support a range of interface standards. The NDI supports V.35, EIA 530A, EIA 530, RS-449, and RS-232 protocols.

Product specifications

The NDI intended for standard business environments. The applicable environmental requirement specifications are: I.E.C. 68-2-6/34; IEC 68-2-27-20.

The NDI complies with the regulatory requirements set forth by the following specifications:

- Canada: Safety - CSA C22.2 No. 950 (1995); EMC - ICES-003;
- United States: Safety - UL 1950 Ed. 3; EMC - FCC Part 15.

Ordering Information

Norstar Product Marketing has created three competitively priced NDI bundles. The bundles simplify the ordering process and ensure that distributors order and receive all the necessary parts to guarantee successful installation. One order code will represent the NDI, the Bandwidth Allocation License (BAL), and the appropriate NDI synchronous serial connection cable for the DTE.

Norstar Data Interface V.35 Bundle

The NDI V.35 Bundle is a cost-effective way to easily integrate the Norstar Modular ICS with a Nortel Networks or 3rd Party DTE device in order to consolidate voice and data network services over a single or multiple T1s.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode), and the NDI V.35 Cable to connect any DTE that supports the open V.35 synchronous protocol.

Norstar Data Interface Bay DB-44 Bundle

The NDI Bay DB-44 bundle is a cost-effective way to easily integrate the Norstar Modular ICS with a BayStack router in order to consolidate voice and data network services over a single or multiple T1's.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode), and the NDI Bay DB-44 Cable to connect any BayStack router (for example: BayStack ARN, AN etc.).

Norstar Data Interface Cisco DB-60 Bundle

The NDI Cisco DB-60 bundle is a cost-effective way to easily integrate a Norstar Modular ICS with a new or existing Cisco router in order to consolidate voice and data network services over a single or multiple T1's.

The bundle includes the NDI, BAL (the internal CSU/DSU keycode), and the NDI Cisco DB-60 Cable to connect any Cisco router (for example, Cisco 2500, 3810 etc.).

Separately Orderable Items

Norstar Data Interface (NDI)

NDI Installer Documentation Kit (English/French)

NDI Connection Cables:

- V.35 Synchronous Connection Cable,
- Cisco DB-60 (V.35) Synchronous Connection Cable,
- Bay DB-44 (V.35) Synchronous Connection Cable,
- RS-449 Synchronous Connection Cable,
- EIA-530/RS-232 Synchronous Connection Cable,
- EIA-530A Synchronous Connection Cable.

Glossary

Term	Meaning
10Base2	Standard for baseband Ethernet. "10" Mbps, in "base" band form, to a maximum distance of about 200 meters. Also known as ThinNet.
10Base5	Standard for baseband Ethernet. "10" Mbps, in "base" band form, using 50-ohm coaxial cable to a maximum distance of about 500 meters. Also known as ThickNet.
10Base-T	An Ethernet local area network that works on twisted pair wiring that feels like telephone cabling. 10Base-T Ethernet local area networks work on home runs in which the wire from each workstation snakes directly to 10Base-T hub.
100BASE-T	Essentially an extension of 10Base-T, 100Base-T is a 100 megabit-per-second local area network known by the generic name of Fast Ethernet. There are three basic implementations of Fast Ethernet – 100Base-TX, 100Base-T4 and 100Base-FX.
56K	56 Kbps: a 64 Kbps digital circuit with 8 Kbps used for signalling. Sometimes called Switched 56.
56K FLEX	x2 is an emerging standard for running data over dial-up phone lines at up to 53,000 bits per second one way and up to 33.5 Kbps the other way. The standard was developed for use on the Internet, with the 53Kbps channel flowing to you.
Analog	An electrical wave or signal carrying sound. Analog signals vary in amplitude or frequency; the signal may be in any state at any time, depending on the voice or data.
ATM	Asynchronous Transfer Mode. ATM provides high-bandwidth, high-speed and large-capacity information delivery. It uses a packet switching technology that employs virtual circuits and multiplexing.
API	Application programming interface. Software that carries out lower level tasks such as managing windows, menus, icons etc.
Backbone	The high-speed, high-capacity cable that connects networks.
Bandwidth	A measure of the data-carrying capacity of a network connection or device. Analog is typically measured in cycles per second (Hertz), while digital is measured in bits per second (bps). For example, users connected to 10BASE-T hub all share the total bandwidth of 10 Mbps. As more users log on to the network through the hub, the bandwidth available to each user declines. A 10BASE-T switch, however, delivers dedicated bandwidth through each port, so each user directly connected to a switch gets 10 Mbps of bandwidth for themselves.
Bandwidth Allocation License (BAL)	A Bandwidth Allocation License is supplied with certain devices, but the BAL must be activated in order for a device such as a NDI to function properly.
Baseband	Networks that use all available bandwidth to send a single signal. This is a simple and relatively inexpensive system.

Term	Meaning
Bridge	A bridge extends the physical reach of networks beyond the limits of each LAN segment. Bridging connects two or more separate networks together. Bridging allows frames to be sent to all destinations regardless of the network protocols used. It also allows protocols that cannot be routed (such as NETBIOS) to be forwarded, and optimizes internetwork capacity by localizing traffic on LAN segments.
Broadband	Networks that divide bandwidth into frequency channels using a process called frequency division multiplexing (FDM). This process allows the network to send multiple signals simultaneously.
Bus	A common LAN topology in which all DTEs are connected to a common medium. Thus, all attached devices can receive transmission simultaneously. A bus can transmit data serially or in parallel.
Cache	A high speed memory designed to hold upcoming or soon to be accessed data. Speeds up a computers operation.
Coaxial	A cable that can carry great quantities of information. It is made of an insulated central conducting wire wrapped inside a conducting layer and an outer protective layer.
CSU	Channel Service Unit. A device that terminates a digital line or channel to another device. A CSU is similar to a modem, except it can pass data at rates greater than 56 Kbps.
Datagram	A method of transmission where sections of a message are sent in scattered order and the correct order is restored by the receiving workstation.
DCE	Data Communications Equipment. This equipment is necessary for computers to connect to the network. DCEs include equipment such as modems and digital service units (DSUs).
DHCP	Dynamic Host Configuration Protocol. A protocol for automatic configuration that provides static and dynamic address allocation.
Digital	Binary code composed of 1's and 0's that represents information. This type of communication is much more accurate, or "cleaner," than analog.
DNS	Domain Naming System. A mechanism used in the Internet for translating names of host computers into addresses.
Domain	In the Internet, the last part of a symbolic naming hierarchy, such as .com, .ca, .edu, .net, etc. For example, in "www. nortelnetworks.com" the ".com" portion is the domain.
DSU	Digital/Data Service Unit. A DSU encodes and transmits digital information across a network. DSUs work in conjunction with CSUs.
DTE	Data Terminal Equipment. DTEs include personal computers (PCs), Macs, UNIX workstations, printers, fax machines and other end-user equipment on the network.
Duplex	Switched Ethernet connections can operate in either half or full duplex transmission modes. Full duplex mode doubles the speed of a device, ie. boosting 10BASE-T switch operation to 20 Mbps and 100BASE-T operation to 200 Mbps.

Term	Meaning
Ethernet	A network protocol standard that specifies how data is placed on and retrieved from a common transmission medium. 10BASE-T is the standard with a transfer rate of 10 Mbps. Ethernet is the most common LAN.
Fast Ethernet	The faster version of Ethernet with a transfer rate of 100 Mbps. 100BASE-TX is the Fast Ethernet standard for copper cabling; 100BASE-FX is the Fast Ethernet standard for fiber optic cabling, which can carry signals farther. Fast Ethernet is ideal for sending large, complex files or using high-performance applications.
FDDI	Fiber Distributed Data Interface. FDDI is a LAN standard that provides very high transmission speeds over an optical fiber dual ring. FDDI uses a token-passing concept similar to token rings.
FDM	Frequency Division Multiplexing. FDM divides a channel into smaller frequency channels. Each message is formatted so it can travel within a precise frequency range. This way, many signals can be sent simultaneously.
Fiber optic	Fiber optics is a LAN technology using light pulses to deliver signals. These optical signals are high quality and can deliver a large amount of bandwidth over long distances.
Firewall	A combination of hardware and software that limits the exposure of a computer or group of computers to an attack from outside. The primary purpose of an Internet firewall is to provide a single point of entry where a defense can be implemented, allowing access to resources on the Internet from within the organization, and providing controlled access from the Internet to hosts inside the organization's internal networks.
Frame	Data bits grouped in a specific format, with source and destination addresses and a flag at each end to indicate the beginning and end of the frame.
Frame Relay	A protocol independent standard that uses data packets, or "frames," of different lengths. It is much faster than X.25 and capable of transferring large amounts of information.
FRAD	Frame Relay Access Device. A generic name for one of a family of devices usually located at a customer site, which multiplex and format traffic for entering a frame relay network.
FTP	File Transfer Protocol. FTP provides access to files at remote sites linked to the Internet. It is widely used to upload and download information across the Internet.
Hardware Address	The unique address assigned to each network device to identify it on the network.
HTTP	HyperText Transfer Protocol. Invisible to the user, HTTP is the actual protocol used by the Web Server and the Client Browser to communicate over the 'wire'. In short, the protocol used for moving documents around the Internet.
Hub	A shared media connecting device for network wiring. All workstations on a shared media workgroup are linked to each other through the hub.
Interface	The physical connection that identifies how two systems will physically connect with each other and the types of equipment needed.

Term	Meaning
Interference	Energy or distortion that a signal sometimes acquires as it travels. This energy interferes with the signal.
Internet	An Internet is an open public network composed of many smaller networks. The best-known example of an Internet is the World Wide Web. Anyone can log on to the World Wide Web and access it for information.
Internetworking	Refers to the exchange of information across networks. When LANs link to create a larger network, they form an internetwork. A WAN is an example of an internetwork.
Intranet	A closed network, available only to identified users. Many companies use intranets to provide information to their employees. This information is available only to employees, and not to the general public.
IP	Internet Protocol. The most important of the Internet protocols. It is software that keeps track of internetwork addresses for different nodes, routes outgoing messages, and recognizes incoming messages.
IP addressing	A system for assigning numbers to network subdivisions, domains, and nodes in TCP/IP networks.
IPNG	IP Next Generation. A term used to describe the efforts of the Internet Engineering Task force to cope with the explosive growth of the Internet by defining the next generation of Internet Protocol.
IPX	Internet Packet eXchange. Novell Netware LAN communications protocol, used to move data between server and/or workstation programs running on different network nodes.
ISDN	Integrated Services Digital Network. The public digital telephone service, which can support much faster data transfer rates than are currently possible with modems over normal, analog telephone lines. ISDN is available as Basic Rate ISDN (BRI – 2B + D) for bandwidth up to 128 Kbps, and Primary Rate ISDN (PRI – 23B + D), for bandwidth up to 1.5 Mbps.
ISP	Internet Service Provider. A vendor who provides access for customers (companies and private individuals) to the Internet and the World Wide Web, who also typically provide services like E-mail. The user typically reaches his ISP by either dialing up with their own computer, modem and phone line, or over a dedicated line installed by a telephone company.
LAN	Local Area Network. LANs are systems of connected computers (and computer peripherals such as printers) in a geographically limited environment, such as an office building. LANs are based on a closed, permanent connection specifically set up for the LAN application. When LANs are linked together with routers, they become Wide Area Networks (WANs).
Loopback	Type of diagnostic test in which signal is returned to sending device after passing through Datacom link or network. Often done by excluding one piece of equipment after another.
MAC	Media Access Control. Often called the hardware address, the MAC identifies a specific device within a LAN for data delivery purposes.
MAN	Metropolitan Area Network. MANs are similar to, but smaller than, WANs. They typically connect two or more local area networks (LANs) within a limited area such as a city.

Term	Meaning
MAU	Multi-Station Attachment Unit. An attachment device, also called a transceiver, that is needed to connect the cable to the transmission medium.
MDA	Media Dependent Adapters. Device used to overcome 100 meter limit of Ethernet wiring. Used to extend range as required. Comes in fiber and copper modes.
Modem	A modem converts a digital signal into an analog signal for transmission across standard phone lines. Modems enable a computer to connect to the Internet.
MUX	A process that aggregates 2 or more channels onto a single transmission facility. Equipment is called multiplexor.
NAT	Network Address Translation. Protocol that ensures network addresses are intelligible to the system.
Netware	A very popular operating system for LANs from Novell.
NIC	Network Interface Card. Hardware that allows DTEs access to the network, acting as a link between the user components and the network components.
NOS	Network Operating Software, which enables users to access and use remote files and programs. The NOS also controls how, when and to whom LAN resources are allocated.
NT	New Technology operating system, from Microsoft, which will let Windows run on high-end machines, such as file servers and workstations.
OC3	Optical Carrier 3. A high-speed fiber optic digital line, offering speeds up to 155.520 Mbps.
Octet	An eight-bit byte, which can be represented by a number between 0 and 255.
OSI Model	Open Systems Interconnection Model. An international set of standards governing how different systems can communicate with each other.
OS2	An operating system originally developed by IBM and Microsoft for use with Intel microprocessors and with IBM personal computers. OS2, is a multi-tasking system that now runs on many different types of computers.
PCM	Pulse Code Modulation. A method used to encode analog signals into a digital format.
Peripheral	Equipment such as printers, fax machines or scanners that are shared between end-users on a network.
Ports	The points at which devices connect to the network. Every switch, hub, router, etc. has a certain number of ports so computers or other networking devices can connect to each other and share information.
PPP	A connection oriented protocol used with TCP/IP applications. Much more robust than the older SLIP protocol. Has the potential to eliminate the need for bridging devices.
Protocol	A set of rules identifying how two systems will "talk" to each other, including identifying and translating the language spoken by each system.
PSTN	Public Switched Telephone Network. The regular telephone system.

Term	Meaning
Repeater	A network element used to connect similar network segments to each other.
Ring	A design of a local area network (LAN) where the wiring loops from one workstation to another, forming a circle.
Router	A network element used to connect networks and to direct the flow of information between two or more networks.
Routing	Routing helps to increase network capacity by localizing traffic on LAN segments and broadcasts resulting from bridged traffic. It also provides security by isolating traffic on segmented LANs. Routing provides a way to transfer user data from source to destination over different LAN and WAN links using one or more network protocol formats.
Segment	A collection of stations on a LAN using the same transmission medium, such as twisted pair or coaxial cable.
Server	A computer dedicated to providing information to the end-user. Some basic types of servers are file servers, database servers, and print servers.
SOCKS	Socket Secure (Server) An Internet security technology developed in 1990.
Stackable	Stackable refers to a system's capacity to connect devices via daisy chaining to additional devices.
Star	A common LAN topology, in which all DTEs are connected to a single, central device, which acts as a processing center and aids in the delivery of signals.
Station	End-user equipment on a network. Also called DTE or workstation.
Statistical Multiplexing	A method for transmitting multiple signals over one channel based on the requirements of connected devices. This method conserves valuable bandwidth space.
Switch	A switched-media connecting device for network wiring. All workstations on a switched workgroup are linked to each other through the switch. Switches are often used to segment the LAN because, unlike hubs, switches provide dedicated bandwidth to each port.
T1	A digital transmission link offering up to 1.544 Mbps. T1 uses two pairs of normal twisted wires, the same as you would find in your house. T1 normally can handle 24 voice conversations, each one digitized at 64 Kbps. T1 lines are used for connecting networks across remote distances.
T3	A digital transmission link, offering up to 44.736 Mbps. The equivalent of 28 T1 lines.
TCP	Transmission Control Protocol. A Transport Layer protocol providing connection-oriented, end-to-end connectivity across networks.
TCP/IP	Transmission Control Protocol/Internet Protocol is a networking protocol that provides communication across interconnected networks, between computers with diverse hardware architectures and various operating systems. The most popular network that uses TCP/IP is the Internet.
TDM	Time Division Multiplexing. A method for transmitting multiple signals over one channel by transmitting a small piece of each signal one after the other.

Term	Meaning
Telnet	A protocol that provides connectivity between computers on the Internet, establishing character-based communication and allowing hosts with different operating systems to communicate.
Token Ring	A ring type of LAN in which a supervisory frame, or token, must be received by an attached terminal or workstation before that terminal or workstation can start transmitting.
Topology	The configuration of a data communications network.
Transceiver	An attachment device - also called a medium attachment unit (MAU) - used to connect a cable to a transmission medium.
Transmission	The transport of information over a physical media such as twisted pair wire or coaxial cable. The information being transmitted can be voice, data, video or image.
Tree	A common LAN topology, the tree is an extended bus LAN with additional "branches" added to extend the effective range of the network.
Twisted pair	Twisted pair wire is the standard telephone wire found inside most businesses and homes. It is inexpensive, lightweight and easy to handle.
UDP	User Datagram Protocol is an alternative to TCP at the Transport Layer, serving the same interface function between the network and application, but not providing error-checking or retransmissions.
URL	Uniform Resource Locator. A standardized way of representing different documents, media and network services on the web, fancy name for a web address.
V.35	A standard for trunk interface between a network access device and a packet network that defines signaling for data rates greater than 19.2 Kbps.
Virtual Circuits	Virtual circuits are connections that look and act like dedicated lines, but actually connect temporarily. Because the connection terminates once the call is complete, bandwidth stays open for other uses.
WAN	Wide Area Networks are networks of LANs. WANs connect LANs across a wide area such as a city, state or country. WANs often use high-speed transmission facilities as their connection.
Web cache	When a user accesses a Web page, the cache engine locally stores the page graphics and HTML text. When another user later requests the same Web page, the content is pulled from the cache engine. This process improves download time for the user and reduces bandwidth use on the network.
Wildcards	Special characters used to represent 1 or more characters in an MS DOS file name. "ERASE*?A?" would erase all files with "A" as the middle letter in a 3 letter suffix.
Winsock Apps	Winsocks (Windows Sockets) are standard APIs (applications programming interface) between Microsoft windows (3.1, 95 and NT).
X.25	The first packet-switching technology for data networks, X.25 delivers packets of information over the best available route at any given time, depending on the need and the available resources.

Norstar Applications Module

Overview

The Norstar Applications Module (NAM) is an industrial-grade computer server designed to run and integrate telephony software applications with the Norstar system.

The Norstar Applications Module is the operating platform for Norstar's integrated software applications such as Norstar Voice Mail, Dial-by-Name and Norstar MINUET, PRELUDE and CINPHONY ACD. (See the Messaging and Call Centers chapters for further details on these applications).

The number of applications that can be loaded onto the Norstar Applications Module will be determined by the type of applications and their processing requirements. If required, multiple Norstar application products can be supported on a single Norstar system.

The Norstar Applications Module is targeted for customers who want to maximize the benefits to their business from integrated software applications. It has been designed specifically to assist customers in transitioning their business communications to higher levels of productivity.

Customer growth and investment protection is achieved through Norstar Applications Module options such as memory expansion to increase processing and storage capacity.

As a new generation computer telephony product, the Norstar Applications Module is the evolution from stand-alone to server-based integrated applications.

Norstar Applications Modules I and II

The Norstar Applications Module I, introduced in June 1995, was the first applications platform developed, using Digital Voice Cards (DVC), to integrate Norstar Voice Mail with Norstar key systems.

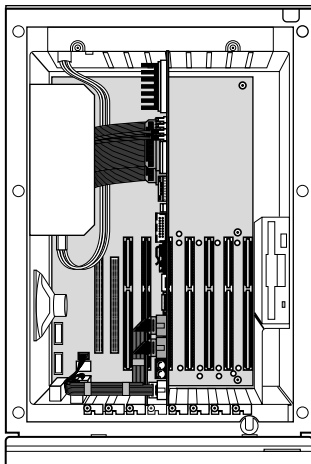
An initial release of the Norstar Applications Module II was available from February to September of 1997. This release also used DVCs to support the Norstar Voice Mail application.

As of the end of September 1997, the Norstar Applications Module II is available with Media Services Base Interface Cards (MS-BIC) and Media Services Processor Expansion Cards (MS-PEC) to run multiple applications simultaneously. The Norstar Applications Module I is no longer available.

The Norstar Applications Module II was refined in January 1999 to make it IP-ready with the addition of an Ethernet connection integrated on the platform. This reduces the need for adding a network interface card and provides 10/100 BaseT Ethernet capability. The total number of expansion card slots needed was consequently reduced.

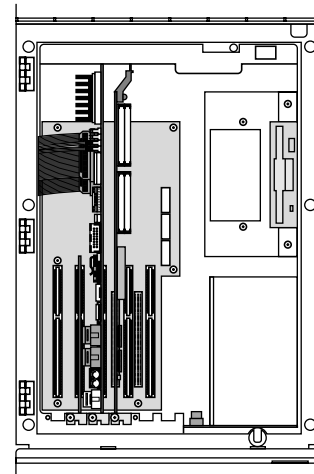
Norstar Applications Module II

Before January 1999



Height: 63 cm (24.80 in.)
 Width: 30 cm (11.81 in.)
 Depth: 17 cm (6.69 in.)
 Weight: 14 kg (30.8 lb.)

After January 1999



The Norstar Applications Module II comes with a Media Services Base Interface Card that provides voice processing capability to connect the module with a Norstar system through a DS30 fiber optic line.

The Media Services card allows for up to 8 voice channels, which can be activated by software keys when purchased with applications.

Using a Single Board Computer equipped with an AMD processor and 32 MB of SD Random Access Memory, the Norstar Applications Module II provides a powerful platform to run multiple CTI applications simultaneously:

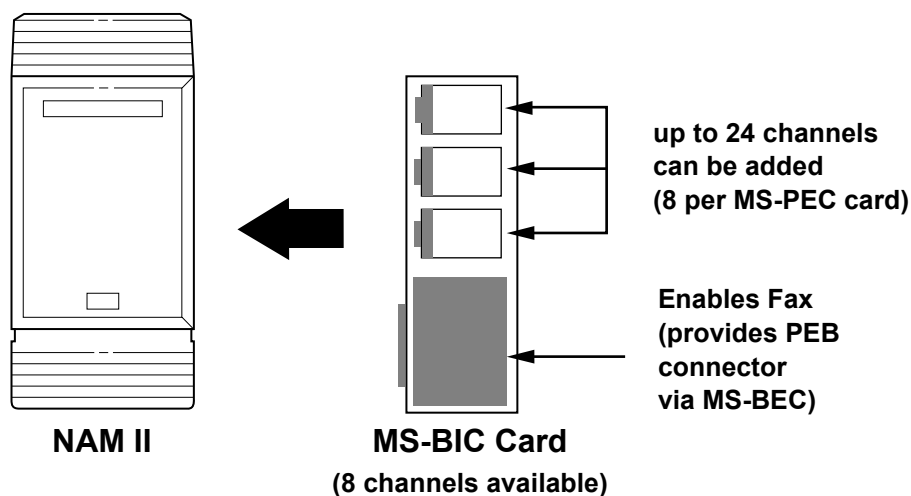
- Norstar Voice Mail and Auto Attendant,
- Norstar Fax Messaging,
- Norstar Desktop Messaging,
- AMIS,
- Norstar Digital Networking,
- Norstar Automated Call Distribution.

With a large capacity Hard Disk Drive (formatted to 2.1 GB), the Norstar Applications Module II supports a voice message storage capacity of at least 200 hours, and has additional space to load a second or third CTI application. A passive backplane provides expansion card slots.

The Norstar Applications Module II platform includes SVGA, keyboard, and mouse connectors that are required for Norstar Prelude and Cinphony ACD. This simplifies the ordering and installation of Norstar Call Center applications.

The Norstar Applications Module II comes with OS/2 WARP Connect pre-loaded and tested, including support for TCP/IP and Peer Services. The OS/2 WARP is a multi-tasking operation system that supports multiple applications running on the Norstar ACCESS telephony software. The Norstar Applications Module II is also available for customers using Norstar TSAPI for industry standard Windows platform connection to Norstar systems.

Media Services Base Interface Card (MS-BIC)



The Media Services Base Interface Card provides voice channels for applications such as Norstar Voice Mail and MINUET ACD on the Norstar Applications Module II.

As the replacement for the Digital Voice Card previously used in the Norstar Applications Module II, the MS-BIC provides up to 8 voice channels initially and can expand up to a total of 32 voice channels by adding Media Services Processor Expansion Cards. The voice channels can be configured to either be shared between applications or dedicated to a specific application. The total voice channels activated is dependent upon the application being installed and may require software keys.

The MS-BIC cannot be used to replace DVCs in existing systems. (DVCs will continue to be used for expansion on those systems.) A DVC-based system cannot be converted to a MS-BIC system.

The MS-BIC connects to the Modular ICS using DS30 fiber optic cable, which plugs into an available expansion port (except ports 11 and 12) on the ICS. The MS-BIC and the DS30 fiber optic cable are included in Norstar Voice Mail and stand alone systems on the Norstar Applications Module II. The card can be located up to 6.5 feet/2 meters from the Modular ICS. This distance can be increased to 1500 feet/450 meters by using a DS30/Station Port Adapter.

Media Services Processor Expansion Card (MS-PEC)

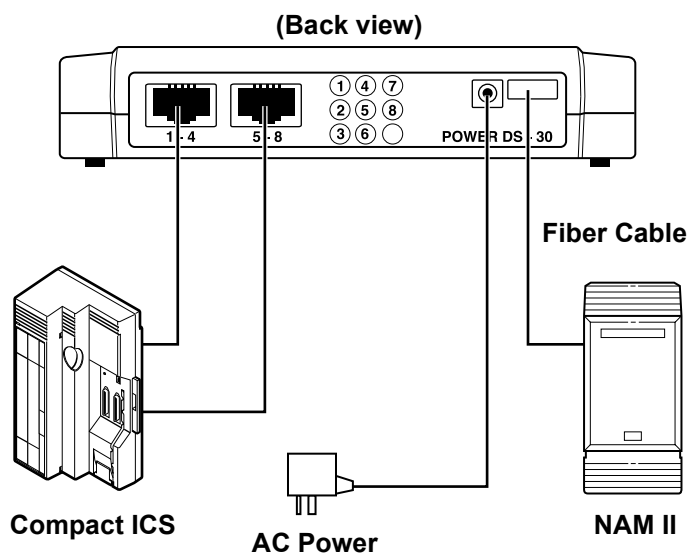
The Media Services Processor Expansion Card is a PCMCIA-style daughter card that can be inserted into one of four available PCMCIA docks on the Media Services Base Interface Card. The MS-PEC increases the number of voice channels that can be processed by the MS-BIC in increments of 8 channels, up to a maximum of 32.

Voice channel expansion can be accomplished as follows: MS-BIC provides up to 8 voice channels; add 1 MS-PEC to grow up to 16 voice channels; add a second MS-PEC to grow up to 24 voice channels; add a third MS-PEC to grow up to 32 voice channels.

Depending upon the application being installed, the activation of the voice channels may require software keys.

Norstar Voice Mail can use a maximum of 16 channels. Each application has a different maximum number of channels available. The total number of voice channels used by the applications cannot exceed 32.

DS30/Station Port Adapter



The DS30/Station Port Adapter converts up to 8 Norstar station ports to a single DS30 fiber optic line. Up to 8 Norstar station lines, or 16 voice channels, are supported with two RJ-45 connectors. This provides a means to connect a Norstar Applications Module II equipped with a MS-BIC to a Compact ICS, Modular 8x24, Compact 6x16 or Norstar 3x8 system.

The adapter can be located up to 1500 feet/450 meters away from the Norstar key system, allowing the Norstar Applications Module II to be located remotely within an office. The DS30/Station Port Adapter comes with an AC power adapter and can be wall or desk mounted.

Media Services Bus Expansion Card (MS-BEC)

The Media Services Bus Expansion Card is a mezzanine-style daughter card that attaches to the MS-BIC and allows the fax option to be implemented.

A PCM Expansion Bus on the MS-BEC card allows the Digital Fax Card to be connected to the Norstar Applications Module via a PEB cable. The MS-BEC is included with the fax option and does not need to be ordered separately.

Digital Fax Card

The Digital Fax Card (DFC) can be installed in an ISA expansion slot on the Norstar Applications Module to provide Fax Messaging functionality (Fax Answering, Fax Overflow, Fax Mail, Fax-On-Demand and Fax Broadcast). The complete Fax Messaging package includes a DFC, an MS-BEC, a PEB Data Cable to connect the fax board to the MS-BEC, a Fax Messaging software installation diskette, and supporting documentation.

The DFC provides four channels for Fax Messaging. The DFC can be dedicated or shared between multiple fax applications and Norstar Voice Mail.

Secondary Hard Drive

A secondary hard drive can be added to increase message storage capacity by an additional 125 hours.

RAM upgrade

All Norstar Application Modules shipped since October 1999 come with 32 MB of SDRAM. Additional memory may be required to support optional applications or features. If a system needs more than 32 MB of RAM, 16 MB or 32 MB DIMMS can be added to increase the total memory up to 128 MB.

Network Interface Cards

In order for the Norstar Applications Module to communicate on the LAN and provide access to Norstar Voice Mail the Norstar Applications Module must have a network connection. Prior to January 1999, this required the installation of a Network Interface Card (NIC).

As of January 1999, the Norstar Applications Module comes equipped with Ethernet on board for connection to a 10/100 BaseT Ethernet LAN. If a Token Ring LAN is being used, a Token Ring NIC must be installed and the on board Ethernet disabled.

NAM/IP Setup Package

The NAM/IP Setup Package is an installation tool that allows the Distributor Representative to prepare the Norstar Applications Module for connection to a LAN. Implemented on a DOS-bootable, 1.44 MB floppy diskette(s), the NAM/IP Setup Package eliminates the need for a SVGA video card, monitor or keyboard. An IP-ready system or addition of a NIC is required for applications such as Desktop Messaging and Digital Networking.

With the NAM/IP Setup Package, the Distributor Representative can:

- Record the current network configuration of the Norstar Applications Module,
- Install the device driver for a NIC,
- Configure and load the appropriate TCP/IP network information and backup the previous configuration in case disaster recovery is required.

Device driver and TCP/IP configuration is entered by running the NAM/IP Setup Package on a Windows PC. Windows 3.x, Windows for Workgroups, Windows 95 and Windows NT PCs can be used.

A high quality, easy to use pop-up Graphical User Interface (GUI) screen is automatically presented on the Windows PC to allow the user to enter the appropriate information. Once complete, the diskette is re-inserted in the Norstar Applications Module and, upon re-boot, the NAM is configured for networking.

NAM/IP Lite Setup Package

As the Norstar Application Module has shipped with integrated Ethernet capability since January 1999, the full NAM/IP package is usually not required. The default software load already implements the necessary device driver for the on-board NIC. Available at no cost, the NAM/IP Lite Setup Package allows the Distributor Representative to:

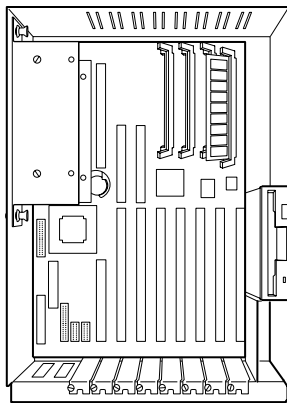
- Record the current network configuration of the Norstar Applications Module,
- Configure and load the appropriate TCP/IP network information and backup the previous configuration in case disaster recovery is required.

Much like the full NAM/IP Setup Package, NAM/IP Lite is a Graphical User Interface (GUI) application that allows the user to enter appropriate information to create a bootable configuration diskette for the Norstar Applications Module.

Norstar Applications Module I and II (DVC based)

The Norstar Applications Module consists of a wall mounted unit, which looks like a Norstar Modular ICS. When installed and mounted next to the ICS, the ICS and Norstar Applications Module form a single integrated system.

Norstar Applications Module I



Height:	63 cm (24.80 in.)
Width:	30 cm (11.81 in.)
Depth:	17 cm (6.69 in.)
Weight	with internal HD and 2 DVCs: 13.6 kg (30 lb.)
	with all slots and bays filled: 15.9 kg (35 lb.)

Digital Voice Card (DVC)

The Digital Voice Card installs in an expansion slot within the Norstar Applications Module and supports up to four voice channels. The NAM Is and NAM IIs purchased prior to September 29, 1997, use the DVC. As of June 29, 1998, DVC based NAMs are no longer shipped.

The four voice channels are activated in two channel increments, and can be configured as dedicated or shared between applications. Two channels of a DVC requires only one station port on the Norstar system. Connection is made using standard teledapt cabling with RJ-11 adapters. If additional channels are required another DVC can be installed to provide four more channels.

When installed on a DVC-based NAM running Norstar Voice Mail Releases 1.X and 2.X, the first two voice channels are automatically enabled for Norstar Voice Mail.

It is important to note that the Media Services Based Interface Cards (MS-BICs) cannot be used to replace Digital Voice Cards in existing systems. DVCs and MS-BICs cannot be used on the same system.

Channel upgrades on systems using Digital Voice Cards

Customers performing channel upgrades on their Norstar Voice Mail systems equipped with DVCs must ensure that sufficient hardware is available to complete the upgrade. It may be necessary to purchase hardware separately. The following table shows voice channel hardware requirements for systems using DVCs:

Voice channels	Minimum DVCs
2 or 4	1
6 or 8	2
10 or 12	3
14 or 16	4

In addition consider the following when assessing if more DVCs are required:

- If the customer is running Norstar Voice Mail Release 3.0 only on a system, then the system requires a minimum number of DVCs to be installed. If additional DVCs are required, they must be purchased separately.
- If the customer is running more than one application on the same Norstar Applications Module, the hardware required to perform the Norstar Voice Mail voice channel upgrade may be installed already. In this case, the decision to purchase additional hardware must also be based on customer needs for either dedicated or shared channels between the two or more applications.

Digital Fax Card for DVC based NAM

The Digital Fax Card (DFC) can be installed in an expansion slot on the Norstar Applications Module to allow Fax Messaging (Fax Answering, Fax Overflow, Fax Mail, Fax-On-Demand and Fax Broadcast). The complete package includes a DFC, a PEB Data Cable to connect the fax board to the DVC, a Fax Messaging software installation diskette, and supporting documentation.

The DFC provides four channels for Fax Messaging. The DFC can be dedicated or shared between multiple applications and NVM 3.0. The DFC is required by both NAM I and NAM II.

Fax Messaging is compatible with Norstar systems DR5 or Modular ICS, and requires Norstar Voice Mail Release 2.0 or higher.

Secondary Hard Drive

A secondary hard drive can be added to increase message storage capacity. A secondary hard drive formatted for the Norstar Applications Module I adds 37 hours of message storage. The secondary hard drive for the Norstar Applications Module II adds over 70 hours of message storage capacity.

RAM Upgrade for DVC based NAM

All Norstar Applications Modules I and II (DVC-based) come with 8 MB of RAM. Additional memory may be required to support software upgrades to Norstar Voice Mail 3.0, optional applications or features and for running multiple applications after upgrading to Norstar Voice Mail 3.0.

A system can be expanded to 16 MB of RAM with the addition of one 8 MB SIMM. If a system needs more than 16 MB of RAM, two 8 MB SIMMS can be added for a total of 32 MB of memory.

NAM Resource Configuration Table

The following configuration tables can be used to ensure that sufficient memory is specified to support multiple applications on the Norstar Applications Module. Note that there is a table for NAMs shipped after October 1999 and another table for NAMs shipped prior to that date.

Instructions for use:

1. Select the NAM Components and enter the Points in the Score column.
2. Add the Score values and enter the Total Score. Compare this value with the list under System Configuration to find the total memory requirements for the NAM.

Norstar Applications Module (NAM II) RAM Configuration Table (For Norstar Applications Modules shipped after October 1999)			
Feature	Components	Points	Score
Operating System (O/S)	OS/2 Base O/S, Mandatory	8	8
	OS/2 PM Mode (Graphical User Interface)	7	7
Automatic Call Distribution	<i>One of the following</i>		
	MINUET	2	
	PRELUDE / CINPHONY I / CINPHONY II	8	
Dial-by-Name	Dial-by-Name (includes GUI)	1	
Norstar Voice Mail	<i>One of the following</i>		
	NVM 4.0, 2 -8 Channels	5	
	NVM 4.0, 9-16 Channels	7	
Norstar Voice Mail Options	NVM Manager only	1	
	Desktop Messaging , including NVM Manager		
	10 Seat License	3	
	25 Seat License	4	
	50 Seat License	5	
	100 Seat License	6	
	Digital Networking (includes NVM Manager)	4	
	Digital Networking, NVM Manager & Desktop Messaging		
	10 Seat License	5	
	25 Seat License	6	
50 Seat License	7		
100 Seat License	8		
Automatic Speech Recognition	ASR	8	
Total Score			
System Configuration			
<ul style="list-style-type: none"> • If score is 33 or less, then NAM requires 32 MB of RAM (shipped configuration);. • If score is greater than 33, then NAM requires 64 MB of RAM. 			

Norstar Applications Module (NAM I & II) RAM Configuration Table (For Norstar Applications Modules shipped prior to October 1999)				
Application	Components		Points Score	
Operating System (O/S)	OS/2 Base O/S, Mandatory		7	7
	OS/2 PM Mode (Graphical User Interface)		4	
	TSAPI		1	
Automatic Call Distribution (ACD) Choose A or B as appropriate	A	MINUET	2	
	B	PRELUDE / CINPHONY I / CINPHONY II	6	
		Wallboard	0	
		Peer Services	1	
Dial-by-Name (DBN)	Dial-by-Name (includes GUI)		1	
Norstar Voice Mail (NVM) Choose A or B as appropriate	A	NVM 4.0, 2 -8 Channels	5	
	B	NVM 4.0, 9-16 Channels	7	
Norstar Applications Choose A, B, C or D as appropriate	A	NVM Manager only	1	
	B	Desktop Messaging , including NVM Manager		
		10 Seat License		3
		25 Seat License		4
		50 Seat License		5
	100 Seat License		6	
	C	Digital Networking (includes NVM Manager)		4
	D	Digital Networking, NVM Manager & Desktop Messaging		
		10 Seat License		5
		25 Seat License		6
50 Seat License		7		
100 Seat License		8		
	AMIS		0	
	FAX Messaging		0	
Automatic Speech Recognition	ASR		8	
Total score				
System Configuration If total score is: <ul style="list-style-type: none"> • 33 or less, then NAM requires 32 Megabytes of RAM (shipped configuration); • Between 34 - 49, then NAM requires 48 Megabytes of RAM; • Greater than 50, then NAM requires 64 Megabytes of RAM. 				

Messaging

Norstar Messaging Overview

General Voice Mail Market

The voice mail industry has experienced explosive growth over the last few years as more and more decision makers have become aware of voice mail/auto attendant products and the benefits they provide for their businesses. In fact, most businesses and organizations today use some form of voice mail, whether it is equipment on their premise, or voice mailboxes that are provided by a service bureau or telephone company. Currently, customers are more interested in voice processing platforms that provide a high level of integration and advanced applications such as Desktop Messaging. The market interest in “unified” messaging is driven by the fact that messaging in all forms - fax, voice mail and e-mail - is increasing annually. Last year there were 2.5 billion voice and e-mail messages daily in North America. And even though fax is a relatively “old” technology, the usage of fax is growing steadily at 40% per year.

Customers are also looking for ways that technology can help them maximize their resources whether it is people or equipment or facilities. Speech recognition, introduced with Norstar Voice Mail 4.0, is one of the ways in which customers can re-deploy their expensive people resources and put technology to work to help them provide better customer service and reduce their operating expenses.

Emerging Trends

What managers are looking for today are more ways to automate or streamline their business processes to take advantage of new technology to differentiate their products or services in their marketplace. The integration of fax mail and voice messaging has been the first step towards providing access to more than just voice messages in the traditional voice mailbox. The market acceptance of unified messaging is also an important indicator that organizations are looking for technology solutions that add value to their overall corporate objectives of success.

Advances in application development for solutions that can enhance basic voice mail and auto attendant are available today and are being implemented by those customers who want to take advantage of other applications to solve their communication problems. The Norstar Applications Module (NAM) has been designed to provide multiple application support so customers can reduce their cost of ownership by using one server to handle multiple applications. For instance, an organization that has already made the initial investment in the

NAM for voice mail and auto attendant use, might find that they have a need for a call center solution for their customer service department. With the NAM, they can simply add one of Norstar's call center solutions, such as MINUET, PRELUDE or CINPHONY, which can share the NAM with voice mail.

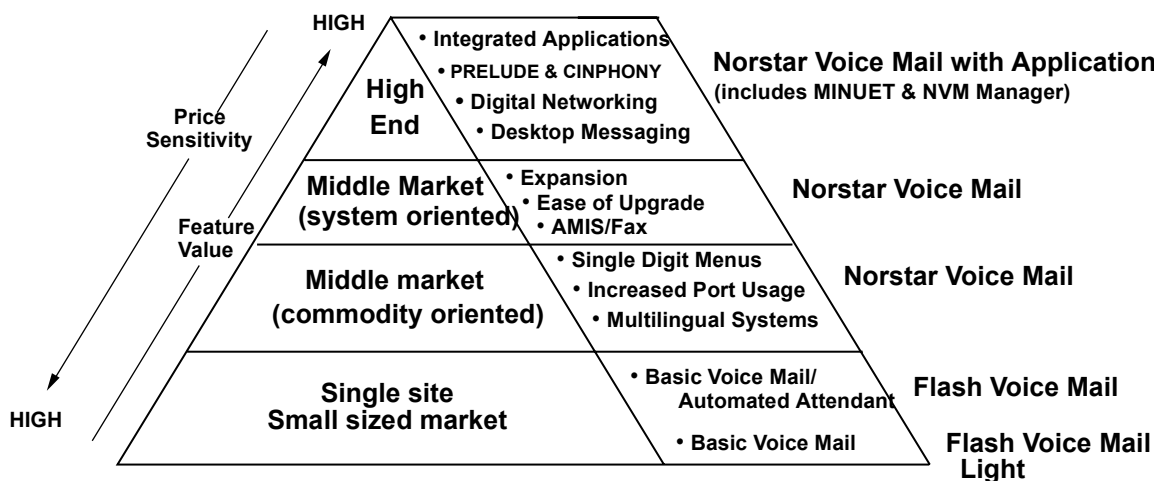
In response to numerous market forces over the last couple of years, a number of unified messaging products have been introduced in the marketplace. Norstar's Desktop Messaging, designed to work with Microsoft Exchange or Outlook e-mail clients, answers that market need. Using Desktop Messaging improves employee productivity because users can more quickly and easily manage all their messages from their PC or laptop, locally or remotely. And because message management is being performed over the LAN, voice mail channels are more available to handle incoming customer calls.

Networking capability is also emerging as a technology solution customers need to run their business. Using Digital Networking to message over an existing data network can improve overall inter-company communications and maximize the investment in the existing data network. The development of the Voice Profile for Internet Mail (VPIM) standard across messaging vendors' systems means that voice and fax messaging traffic can be sent over the Internet or corporate network, avoiding the long distance cost of messaging over the public telephone network.

Remote administration from the PC desktop is another marketplace demand that is addressed by the three software utilities - Norstar Voice Mail Manager, Mailbox Manager and Operator Manager - which can be used to manage various aspects of the system, a personal mailbox or the automated attendant. These utilities can be used on any computer that uses Windows 95, Windows 98 or Windows NT operating systems.

A common theme underlying many of these emerging trends is the convergence between voice and data networks. The NAM now includes an Ethernet port that can be immediately connected to a data network to enable many of these new functions without the expense and installation of a separate Network Interface Card (NIC).

Norstar Messaging Portfolio



Norstar Messaging Positioning to End Users

Norstar offers a messaging product portfolio designed to meet the needs of businesses of any size - those from 12 mailboxes up to 1000 mailboxes. Norstar's messaging product portfolio includes:

Flash Voice Mail

Flash Voice Mail addresses the smaller and single-site customer and meets the needs of customers who require a cost-effective messaging and auto attendant product. These customers should be those who are not likely to ever need more than 4 voice channels, 180 minutes of storage or 48 mailboxes. Generally, these customers will be more sensitive to price and less interested in advanced features or networking. In October, 1998, the Norstar Flash platform was enhanced to support Flash ACD, a small call center solution that provides entry level call routing and queuing.

Flash Voice Mail Light

Flash Voice Mail Light includes 12 mailboxes, 90 minutes of storage, and the Flash Voice Mail feature set, with the exceptions of Custom Call Routing and Auto Attendant.

Norstar Voice Mail

Norstar Voice Mail meets the needs of larger organizations that want a comprehensive voice mail, auto attendant product that can also offer advanced features like Fax Messaging, Desktop Messaging, AMIS and Digital Networking, and VPIM. Norstar Voice Mail minimizes the initial investment because it has a 2-channel entry point and can expand in 2, 4, 6, or 8 channel increments, up to 16 channels. Norstar Voice Mail is also packaged with a small call center solution, MINUET ACD, which can be configured to work with voice mail and auto attendant to provide excellent call coverage and call queuing and call routing. The previous version of MINUET (1.0) only supports incoming calls on analog lines. MINUET NVM 4.0, supports incoming calls over PRI and is fully compatible with Modular ICS 4.0 and above.

Norstar Voice Mail provides multi-tenant support and guest mailboxes. In a multi-tenant environment, up to four organizations can appear to have their own voice mail with their own auto attendant greeting and CCR trees. Guest mailboxes are available for better communication with suppliers, customers or remote employees.

Norstar Voice Messaging Products System Capacity Comparisons

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Channels	2	2, 4	2, 4, 6, 8	2, 4, 6, 8, 10, 12, 14, 16	2, 4, 6, 8, 10, 12, 14, 16	2, 4, 6, 8, 10, 12, 14, 16	2, 4, 6, 8, 10, 12, 14, 16
Greeting Tables	2	2	4	4	4	4	4
Hours of Voice Storage	1.5	1.5, 3	12	30	70	100	200
Maximum Mailboxes	12	24 or 48	500	1000	1000	1000	1000
Maximum trunk assignment	220	220	344	344	344	344	344
No. of greetings	n/a	20	40	40	40	40	40
Voice channel expansion on NAM	n/a	n/a	DVC	DVC	DVC	DVC	DVC
Voice channel expansion on NAM II	n/a	n/a	n/a	n/a	n/a	MS-PEC	MS-PEC

Norstar Voice Mail and Flash Voice Mail Integration with Norstar

CMS/Class Integration

In addition to the standard telephone answering and auto attendant call routing benefits, Norstar offers some specific advantages because of the tight integration between the ICS and voice mail. When the Norstar ICS is equipped with CMS/Class network features, Norstar messaging products provide some very powerful business tools:

- Auto attendant can route calls based on up to 100 Calling Line Identification (CLID) numbers to either a specific CCR tree, extension, or mailbox. This routing can also be performed based on area code or prefix. Using this capability means that calling customers can not only be routed to their geographic customer service representative based on their calling number, it also means that when that representative is already on the phone, they can hear a special greeting, that insures they know their call is important.
- CLID and caller's name, if available, is stored in the mailbox with each message and users can call back those numbers using the "CALL" soft key, speeding up return calls and simplifying the call return process.

In addition to the primary greeting and the extended absence (alternate) greeting, users can record up to 3 personalized CLID greetings for specific callers like a special customer.

Intelligent Integration

Competitive voice mail systems when interfaced with Norstar ICS systems cannot compare to the capabilities provided by the superior integration of Norstar Voice Mail and Flash Voice Mail. These integrated capabilities are demonstrated by a simple and easy-to-use interface, displayed in visual prompts on the telephone set that guide the user to activate messaging commands and functions by using the soft keys just below the telephone LCD window. Also, the user gets message notification through a “Message For You” prompt that appears on the display whenever there is a new voice or fax message in the mailbox.

Other integration advantages include:

- Double the efficiency in connecting voice channels to the ICS core. Since Norstar Voice Mail uses both the B1 and B2 channels on the ICS, half the number of station ports are required than any competitive voice messaging system. This is a significant competitive advantage, especially when the customer's system is close to maximum station capacity.
- Access to the name directory on the telephone LCD display.
- Ability to retrieve calls that have forwarded to voice mail using “Interrupt” with Feature 987. This feature can help avoid several messages a day by talking live with the caller.
- Ability to route calls and have specialized greetings using incoming CLID information.
- Instant status information on any DN - competitive systems must first transfer the call to determine the DN status.
- Ability to retrieve messages on intercom by only supplying a password - competitive systems require mailbox number and password entry.
- Transfer to an extension or external number from a CCR tree.
- Ability to integrate CMS/Class features directly from the ICS without adding additional hardware devices.
- In addition to all the user benefits derived from the Norstar integration, perhaps the most significant benefit for the customer is that Norstar provides a single vendor solution with products that meet or exceed Nortel reliability and quality standards.

General Voice Messaging Overview

Flash Voice Mail and Norstar Voice Mail work with a core Norstar ICS, offering a receptionist service that routes calls and provides voice message taking capability. When enabled, Norstar voice messaging answers incoming calls and routes the calls to extensions and mailboxes within the system.

Voice messaging components

Norstar voice messaging has three main components: Automated Attendant, Mailboxes (voice messaging), and Custom Call Routing (CCR).

- The Automated Attendant works as a receptionist would when answering incoming calls. Using a voice prompt, it plays a list of options to a caller. If the caller knows which option they want, they can interrupt the Automated Attendant by pressing their selection on the dialpad of any tone dial telephone, or with Norstar Voice Mail 4.0 with speech recognition, by speaking their selection.

When an option has been selected, the Automated Attendant responds to the command by either routing the call to an extension or mailbox within the company or directing a caller to the Company Directory or Designated Operator.

- Mailboxes are added by the System Coordinator and then initialized by the mailbox owner. They store the voice messages left by callers. Any caller can leave a message after a mailbox is initialized.
- Custom Call Routing (CCR) is a single-digit access application, providing callers with a series of voice prompts and call transfer options.

About the Automated Attendant

The Automated Attendant is the Norstar voice messaging receptionist. When enabled, the Automated Attendant answers the company's incoming telephone lines according to the time of day. When the Automated Attendant is enabled, the Automated Attendant menu prompt provides a list of options so that a caller can:

- Reach a DN or a mailbox in the company,
- Leave a message in a mailbox,
- Select an Alternate Language,
- Look for an extension or mailbox in the Company Directory,
- Reach the company receptionist or Designated Operator,
- Open a Personal Mailbox as a mailbox owner.

The Automated Attendant provides callers with commands to use each of these options. A caller must press the button associated with the option they want to activate. For example, to use the Company Directory, press **#**.

About the Company Directory

The Company Directory is a list of mailbox owners registered with Norstar voice messaging. Before any mailboxes can be used, the owners must record their names in the Company Directory. If mailbox owners do not want their names to appear in the Company Directory, they can see the System Coordinator. Names included in the Company Directory can be changed at any time.

About the Mailboxes

A mailbox is a storage place for messages. A Norstar Voice Mail system can have a maximum of 1,000 mailboxes while Flash Voice Mail can have a maximum of 48 mailboxes, and Flash Voice Mail Light has a maximum of 12 mailboxes. There are four groups of Norstar voice messaging mailboxes, including:

- Special or Guest Mailboxes,
- Personal Mailboxes,
- Information Mailboxes,
- Network Delivery Mailboxes.

Special Mailboxes are administered by the company's System Coordinator.

The System Coordinator mailbox is used by the System Coordinator as a Personal Mailbox. Employees can leave messages for the company's System Coordinator in this mailbox.

Personal Mailboxes are assigned by the System Coordinator and maintained by the mailbox owner. A Personal Mailbox can be a User or Guest Mailbox.

- User Mailboxes can be assigned to each user who has an operating Norstar extension. User Mailboxes store messages for users who are unable to answer their telephone.
- Guest Mailboxes provide temporary employees and guests with access to internal messaging and call routing features. Guest Mailboxes do not have an operating extension.

Information Mailboxes are designed to provide an informative message to a caller. This type of mailbox differs from the other mailboxes because it does not take messages. It plays a Personal Greeting to the caller, but does not prompt for, or allow, the caller to leave a message.

Network Delivery Mailboxes are used with the optional AMIS or Digital Networking applications to simplify addressing to remote locations.

How Custom Call Routing Works

Custom Call Routing (CCR) is an application that works with Norstar voice messaging to provide a call routing path that directs incoming calls. CCR enhances the Norstar voice messaging call routing abilities by allowing incoming callers to route their own calls along call paths created by the System Coordinator. This application allows a company to customize the call routing capabilities to suit their needs. CCR does not replace the Norstar voice messaging call routing function, but enhances it.

Designing and Building a CCR Tree

Designing a CCR Tree involves:

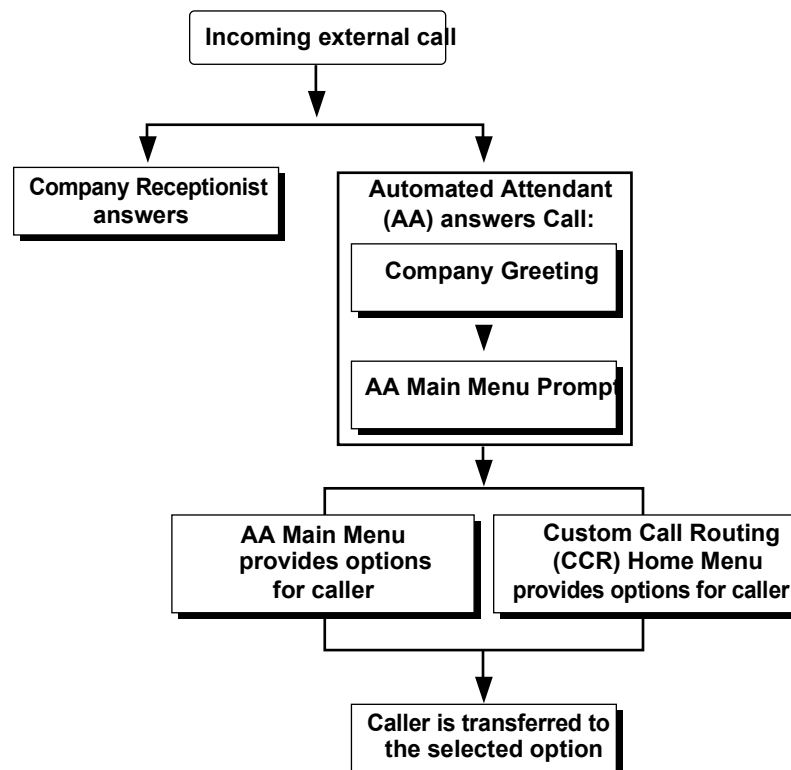
- Determining frequently requested departments,
- Determining frequently called extensions,
- Making a list of goods and services for promotion in Information Messages,
- Selecting mailboxes assigned to Leave Message Points,
- Determining call Destination Types,
- Recording the prompts and messages.

About the Home Menu

The Home Menu is the introductory voice prompt that the system administrator records. It provides a list of single-digit options to a caller. After listening to the Home Menu, a caller selects an option by pressing a number on any tone dial telephone. Options in the Home Menu can route a caller to:

- An information Message,
- A mailbox to leave a message,
- An extension,
- Another menu.

Norstar Voice Messaging Call Answering Overview



Norstar Voice Mail 4.0 Product Overview

Norstar Voice Mail Release 4.0 continues the evolution of voice mail and automated attendant product offerings from Norstar and with its introduction, replaces all previous Norstar Voice Mail releases. Release 4.0 introduces new standard features like Record a Call, Mailbox Manager and Operator Manager, and also introduces speech recognition technology into the Norstar product portfolio. New Release 4.0 systems are supported on the Norstar Applications Module (NAM). See separate chapter on the NAM for details.

Existing Release 1.X, 2.X or 3.X Norstar Voice Mail systems can be upissued to Release 4.0 even though they may currently be running on the NAM I provided the NAM I is equipped with a 540 MB hard drive. The NAM provides the capability for additional applications, such as call center software, to share the NAM with Norstar Voice Mail, provided the memory guidelines for the combination of applications used is followed. When running multiple applications on the NAM, more than 16 MB of RAM memory may be required.

Norstar Voice Mail Release 4.0 provides:

- Continued strong CMS/Class integration features,
- A bilingual system,
- Comes bundled with MINUET ACD small call center solution,
- Comes bundled with NVM Manager and the Dial-By-Name application,
- New standard features,
- Continued support for the Fax Messaging, Desktop Messaging, Digital and AMIS networking options,
- Support for the Voice Profile for Internet Mail (VPIM) option,
- New option for Speech Recognition Automated Attendant,
- Compatibility for Release 4.1 Modular and Compact ICS. Installed base Norstar Voice Mail customers that upgrade their core system to Modular or Compact ICS 4.1 must upgrade their Norstar Voice Mail to Release 4.0 for compatibility.

Note: When installing NVM 4.0 with a Norstar Modular ICS that is using ISDN PRI lines, it will be necessary for the system administrator to specify a “dummy” line or line pool number when configuring any of the following user features:

- Off-premise Notification to a phone or pager number,
- Outbound Transfer from the user mailbox to an external number,
- Custom Call Routing (CCR) Tree external transfer points,
- Preset fax to an external number (where fax is installed),
- Printing or copying a fax message to an external fax machine.

Norstar Voice Mail 4.0 New Standard Features

Norstar Voice Mail 4.0 contains the same features and functionality as Release 3.0, with the following additions, enhancements and modifications: (See end of this chapter for a complete checklist of release content and feature descriptions).

Record a Call

- When activated by Feature Code 989 from the Norstar user's set, allows the user to have the voice mailbox act like a tape recorder and record the telephone conversation,
- Recorded conversation has the same appearance to Norstar Voice Mail as a voice message,
- User can forward, delete, or in conjunction with Desktop Messaging, can even “archive” the call (“message”) as a wave file to a PC hard drive, floppy disc, or zip drive,
- In conjunction with Desktop Messaging, the user can change the “subject” line of message on the PC display and save it to an appropriate project, person or file,

Note: Because of the sensitivity to local laws in different regions of North America, the feature is disabled for all Classes of Service and must be specifically enabled by the system administrator.

Norstar Voice Mail Mailbox Manager (NVM Mailbox Manager)

- Standard and packaged with all Norstar Voice Mail Release 4.0 systems,
- Allows users to manage their mailbox functions from their multimedia desktop PC,
- Can be used in conjunction with Desktop Messaging or as a stand-alone tool. Does not require Desktop Messaging to operate,
- The NAM must be configured for and connected to the customer's LAN via either the onboard Ethernet connection (using the NAM/IP Lite for configuration) available on newly shipped Release 4.0 systems, or a customer provided separate Network Interface Card (NIC).
- Software is included on the Documentation and Client Software CD-ROM that ships with all new 4.0 systems,
- Client software can be loaded at the desktop from either the CD-ROM or diskettes can be created from the CD-ROM for client installation.



After logging on with their password, the user can perform any of the following mailbox functions:

- Initialize the mailbox, including recording spoken name, changing the default password
- Recording and selecting personal, primary or alternate greetings,
- Changing password,
- Changing spoken name and target attendant,
- Setup and control of Off Premise Message Notification,
- Setup of preset Fax Printing destination,
- Setup and control of outbound transfer.

Norstar Voice Mail Mailbox Manager provides an easy to use graphical interface that provides PC users an alternative to telephone keypad mailbox administration.

Norstar Voice Mail Operator Manager (NVM Operator Manager)

NVM Operator Manager:

- Allows a system administrator to manage certain system administration functions from the desktop,
- The system administrator can also change the “business status” and record or change the company greeting,
- Software is included on the Documentation and Client Software CD-ROM that ships with all new 4.0 systems,
- Client software can be loaded at the desktop from either the CD-ROM or diskettes can be created from the CD-ROM for client installation,
- Is the desktop equivalent of functions performed using Feature 982 from the telephone display,
- Any user could launch the application, however, they would need to know the system password to open the application and make any changes to the system configuration.

Below is a sample of the main menu window for system administration:



Single Button Call Forward to Voice Mail (Feature 984)

On prior voice mail releases, the process to forward calls to voice mail required the user to program the voice mail DN and program Feature 4 to forward their extension to the voice mail DN. Now, with Release 4.0, the user can activate Feature 984 to forward all calls to voice mail automatically.

Single Trunk External Link Transfer

Prior to Release 4.0, an external transfer from either a CCR tree or outbound transfer from a mailbox required the use of two trunks throughout the duration of the call. The Link Transfer capability has been added to Release 4.0, in response to customer requirements to help them maximize their trunk resources and avoid off-system transfers, which consume two trunks for the duration of the call that is transferred.

Norstar Voice Mail 4.0 New Optional Features

Speech Recognition Auto Attendant and Voice Activated Dialing

With the introduction of Norstar Voice Mail 4.0, Speech Recognition Auto Attendant will be available as an option to provide a call routing service for external callers who simply speak the name of the party they are calling. The Speech Recognition capability also supports Voice Activated Dialing, which allows an internal Norstar set user to originate a call by activating Feature 988 and speaking the names that are in the Company Directory. Speech Recognition Auto Attendant is packaged as a two-channel option that can be upgraded to a maximum of four channels.

Note: The first release of Speech Recognition Auto Attendant will be available in North American English ONLY. Norstar plans to add French, Spanish and bilingual recognition to the Speech Recognition application in a later release.

- Uses Nortel's patented speaker-independent speech recognition technology so that any caller can speak the name they are calling and the application will use the Company Directory information to correctly route the call.
- An optional Speech Recognition Name field added to the company directory can accommodate up to 40 characters.
- Supports a directory of up to 500 names. (Names for this field can only be entered using Norstar Voice Mail Manager, which is included with every Norstar Voice Mail 4.0 system.)
- A field for synonyms or alias names improves the chances that the spoken name will be matched in the directory. (eg. directory name may be Robert, the alias field could be "Bob", so either spoken name would be recognized and the call correctly routed.)
- Alias field could also be used to designate a department name, like marketing, or customer service.
- Each listing in the company directory can have one alias.
- Can also be configured to support callers speaking "Operator" to reach a live attendant or "Menu" to be routed to AA or CCR menus.
- "Barge-in" capabilities allow a caller to speak before the prompt is finished and the beep sounds. The speech recognizer is "listening" as soon as the call begins, so callers who have used the system before can quickly get transferred without waiting for the whole prompt to play.

Speech Recognition Installation Requirements/Engineering Guidelines

Note: The new Speech Recognition technology makes use of the same digital signal processing resources in the Norstar Application Module that have previously been only used as voice channels for applications. As a result, slightly different rules apply for engineering a system that has the Speech Recognition Auto Attendant option with Norstar Voice Mail 4.0. For systems without the Speech Recognition option previously stated engineering rules still apply.

- Requires 32 MB of RAM memory,
- Only supported on MS-BIC-based NAM running Release 4.0 software,
- NAMs supporting Speech Recognition option along with other applications, like PRELUDE, may require additional memory,
- Systems with 4 channels of Speech Recognition can only support a maximum of 24 voice channels for all other applications (Norstar Voice Mail, and ACD),

- MS-PECs are required with Speech Recognition, as per following table:

Maximum voice channels available for all applications	MS-PECs required for 2 channels of Speech Recognition	MS-PECs required for 4 channels of Speech Recognition
12	2	3
24	3	4
32	4	not applicable

About the Norstar Voice Messaging Feature Codes

When using Norstar voice messaging from a Norstar telephone, the user must enter a Feature Code. Feature Codes are used to access the different functions and options of Norstar voice messaging.

- Leave Message Feature Code is used by mailbox owners to leave a message in a mailbox initialized with Norstar voice messaging. To use the Leave Message feature, press **Feature** .
- Open Mailbox Feature Code is used by mailbox owners to open their Personal Mailboxes. All Personal Mailboxes are protected by a password that is established by the mailbox owner. Use the Open Mailbox Feature by pressing **Feature** .
- Operator Status Feature Code is used by the System Coordinator, receptionist or Designated Operator to set the Operator Status. When an Operator is not available, the Operator Status must be set to NO. This alerts the Automated Attendant that the receptionist or Designated Operator is not available. This Feature Code is also used to establish whether a business is open or closed. This Feature Code is protected by a password. To use the Operator Status feature, press **Feature** . (Note: NVM 4.0 includes NVM Operator Manager, which is the desktop equivalent of functions performed using Feature 982).
- Norstar voice messaging Directory Number (DN) Feature Code is used to determine the Norstar voice messaging Directory Number(DN). This number is used to forward a Norstar telephone to Norstar voice messaging. Entering **Feature** will display the voice messaging DN on the telephone display.
- Transfer Feature Code is used to transfer calls to a mailbox. While the call is active (the call is not put on Hold), the user presses the memory button where Feature 986 is programmed, then enters the mailbox number where they want to direct the call. The caller is then transferred. The Transfer Feature Code is activated by pressing **Feature** .
- Interrupt Feature Code is used to interrupt Norstar voice messaging when a caller is listening to the Personal Mailbox Greeting or is leaving a message. This allows a mailbox owner to speak with a caller who has reached their mailbox. Pressing **Feature** allows a mailbox owner to use the Interrupt Feature Code.

- Record a Call Feature Code. During a call, the user presses 9 8 9 to activate the feature. The conversation will be recorded in the mailbox corresponding to the DN of the telephone where Feature 989 is activated. The party who did not initiate the call may hear standard Norstar hold tones during the time it takes for the system to conference in voice mail. Then both parties will hear this prompt, “this call is being recorded”, followed by a recording beep tone. If more than one extension is targeted to one mailbox, Feature 989 from any of those telephones will record the conversation in the assigned mailbox (requires NVM 4.0).
- Voice Activated Dialing provides an internal user the ability to make an internal call by activating 9 8 8 and speaking the names of co-workers that are listed in the Company Directory (requires NVM 4.0).
- Single Button Call Forward to Voice Mail. 9 8 4 allows the user to program a single button to forward all calls automatically to voice mail. The user simply activates Feature 984 (requires NVM 4.0).

Norstar Voice Mail Architecture

Norstar Voice Mail 4.0 Models

Norstar Voice Mail 4.0 is available in eight models, and scaleable from 2 to 16 channels. Like Norstar Voice Mail 3.0, Norstar Voice Mail 4.0 is ordered as a Special Pricing Package (SPP) code and comes bundled as a Norstar Voice Mail 4.0 Model 2 equipped with a Media Services Base Interface Card (MS-BIC) and, depending on the model size ordered, the appropriate number of software key codes and a Media Services Processor Expansion Card (MS-PEC). The MS-BIC provides voice channels for applications such as Norstar Voice Mail, and MINUET ACD on the NAM II.

NVM 4.0 Model (Bundled package)	# of channels	MS-BIC card	# of MS-PEC cards	Voice Channel Upgrade Keycodes	# of Fiber Expansion Cartridge Ports	Hours of Memory Storage	Memory RAM
16	16	√	1	8+6	1	200	16MB
14	14	√	1	8+4	1	200	16MB
12	12	√	1	8+2	1	200	16MB
10	10	√	1	8	1	200	16MB
8	8	√	n/a	6	1	200	16MB
6	6	√	n/a	4	1	200	16MB
4	4	√	n/a	2	1	200	16MB
2	2	√	n/a	n/a	1	200	16MB

The Norstar Voice Mail 4.0 models have the following differences from Release 3.0 models:

- On board Ethernet port,
- Hours of storage are increased to 200 hours (from 100 hours on NVM 3.0),
- NAM/IP Lite diskettes for Ethernet configuration,
- Includes MINUET ACD,
- Includes NVM Manager.

Norstar Voice Mail 4.0 Upgrades and Options

Software upgrades to Norstar Voice Mail Release 4.0 require purchase of the Norstar Voice Mail 4.0 software upgrade package for each system. The upgrade package includes the software keycode for Release 4.0 and 4.0 documentation. The installer needs the Release 4.0 software package that includes the 4.0 software on CD-ROM, upgrade and add-on guides, and the necessary boot diskettes. The 4.0 software upissue package can be installed at multiple sites, however, each site must have a security key code to install the upgrade.

The Release 4.0 security keycode is for base Release 4.0 software, including two seats of Desktop Messaging, but does not include the options - additional Desktop Messaging seats, Digital Networking, VPIM, Speech Recognition or Fax or AMIS capabilities. However, the Release 4.0 security keycode will upgrade all of these features on systems where they were already installed.

For NAM II, it is not necessary to delete messages to allow sufficient space for the upgrade to Release 4.0. Any Norstar Voice Mail 1.x or 2.x system can be upgraded to Release 4.0 provided the primary hard drive has at least 30 hours of message capacity (540 MB drive). Systems with smaller hard drive must replace the hard drive as part of the upgrade. The Norstar Voice Mail 4.0 upgrade documentation provides full details on the process for upgrading.

Norstar Voice Mail Release 1.X or 2.X customers who plan to upgrade to Release 4.0 and add any of the new Release 4.0 options will also require additional memory. A minimum of 16 MB RAM is required for Release 4.0.

Adding Voice Channels to Norstar Voice Mail 4.0

Channel upgrades on Norstar Voice Mail 4.0 Systems Using the Media Services Base Interface Card (MS-BIC)

Customers performing channel upgrades on their Norstar Voice Mail 3.0 and 4.0 MS-BIC based systems must ensure that sufficient hardware, which may need to be purchased separately, is available to complete the upgrade. For systems that use the MS-BIC for voice channels, the following hardware is required. The Media Services Processor Expansion Card (MS-PEC) is installed on the MC-BIC and is used to expand any system beyond 8 voice mail channels.

Number of Norstar voice channels required	Minimum hardware necessary
2, 4, 6 or 8	MS-BIC only
10, 12, 14 or 16	MS-BIC plus one MS-PEC

In assessing whether the MS-PEC is required, the following should be taken into consideration:

If the customer is running more than one application on the same NAM, then the hardware required to perform the Norstar Voice Mail voice channel upgrade may already be installed. In this case, the decision on whether or not to purchase additional hardware must also be based on customer needs for either dedicated or shared channels between two or more applications.

Media Service Processor Expansion Card (MS-PEC)

The MS-PEC is used to expand the MS-BIC in increments of 8 channels up to a total of 32 channels. Only 16 channels on any system can be used for voice mail, however, other channels may be needed to support other applications, like MINUET. The additional channels are activated by the installation of key codes, which are purchased in conjunction with voice mail channel upgrades or other applications. The MS-PEC is also the required hardware to support the Speech Recognition Auto Attendant application.

Channel upgrades on Norstar Voice Mail 4.0 Systems Using Digital Voice Cards (DVC)

Customers performing channel upgrades on their Norstar Voice Mail systems equipped with Digital Voice Cards (DVC) must ensure that sufficient hardware, which may need to be purchased separately, is available to complete the upgrade. For systems that use the DVC for voice channels, the following hardware is required:

Number of Norstar voice channels required	Minimum number of DVCs necessary
2 or 4	1
6 or 8	2
10 or 12	3
14 or 16	4

In assessing whether additional DVCs are required, the following should be taken into consideration:

If the customer is running more than one application on the same NAM/NAM II, the hardware required to perform the Norstar Voice Mail voice channel upgrade may already be installed. In this case, the decision on whether or not to purchase additional hardware must also be based on customer needs for either dedicated or shared channels between the two or more applications.

Norstar Voice Mail 4.0 Memory Upgrades

Additional memory may be required to support additional applications or optional features.

- All NAMs (shipped since October 1999) with Release 4.0 ship with 32 MB of SDRAM.
- Memory upgrades are available in 16 MB and 32 MB DIMMs to increase the total memory up to 128 MB. (8 MB and 16 MB SIMMS are available for memory upgrade of older Norstar Application Modules.)
- NAMs supporting voice mail with PRELUDE or CINPHONY ACD always require 32 MB of memory.

Norstar Voice Mail 4.0 Documentation

- Distribution of documentation and client software has been simplified with NVM 4.0.
- Documentation and Client Software CD-ROM included with every Documentation Kit.
- CD-ROM includes copies of all installer documentation, customer documentation and desktop software.
- Hard copies of system administrator and end-user documentation remain in the Documentation Kit.

- A hard copy of the NAM Installation and Maintenance Manual will no longer be included with every Norstar Voice Mail system. This document can be viewed or printed from the Documentation and Client Software CD-ROM and is still a separately orderable paper copy item from Norstar.
- Documentation and Client Software CD-ROM also contains the variety of desktop software that now ships with Norstar Voice Mail 4.0, including Desktop Messaging Client software, Norstar Voice Mail Manager Client, and Mailbox and Operator Manager software.
- Any or all of the software can be installed on a PC directly from the CD-ROM, or install diskette sets can be created from the CD-ROM if needed.

Norstar Voice Mail Summary of Multiple Applications Voice Channel Requirements on MS-BIC Based Systems

MS-BIC based systems without Speech Recognition Automated Attendant			MS-BIC based systems with 2 channels Speech Recognition Automated Attendant			MS-BIC based systems with 4 channels Speech Recognition Automated Attendant		
Channels available for applications (NVM* and /or ACD)	MS-BIC card	MS-PEC cards required	Channels available for applications (NVM* and /or ACD)	MS-BIC card	MS-PEC cards required	Channels available for applications (NVM* and /or ACD)	MS-BIC card	MS-PEC cards required
2	√	0	2	√	2	2	√	3
4			4			4		
6			6			6		
8			8			8		
10	√	1	10			10		
12			12			12		
14			14			14		
16*			16*			16*		
18	√	2	18	√	3	18	√	4
20			20			20		
22			22			22		
24			24			24		
26	√	3	26	√	4	26	not applicable	not applicable
28			28			28		
30			30			30		
32			32			32		

* Note: In all cases, maximum number of channels for Voice Mail is 16.

Norstar Voice Mail Manager Application

Norstar Voice Mail Manager is a Windows™-based Graphical User Interface (GUI) for administering Norstar Voice Mail. The administration can also be performed through a M7310 or M7324 Norstar telephone set as it is done today. Norstar Voice Mail Manager provides an easy-to-use interface that is more user friendly than administration from the telephone set. Norstar Voice Mail Manager can be used locally or remotely.

Norstar Voice Mail Manager uses a standard Windows™ interface and uses menus and dialog boxes to administer the system. The main menu has been designed as closely as possible to match the existing Feature 982 and 983 telephone interface.

The Voice Mail Manager is packaged with Norstar Voice Mail 4.0.

There are some functions that are not accessible from Norstar Voice Mail Manager but will continue to be administered using Feature 983 on the telephone set. These functions are:

- Voice recording and playback (Greetings administration),
- Backup and restore to floppy on the NAM,
- Fax load support from a floppy in the NAM,
- CCR tree manipulation.

The connection between the Norstar Voice Mail Manager PC and the NAM can be accomplished in three ways:

- Across a TCP/IP network, in which case both the NAM and the PC must be connected to the network with a NIC (NVM 4.0 includes an onboard Ethernet card),
- Locally, via a null modem cable connection over a Point-to-Point Protocol (PPP) connection.

Norstar Voice Mail Manager Benefits

The principal benefits of the Norstar Voice Mail Manager include:

- PC-based tool using Windows interface,
- LAN and WAN allow any PC to be used for system administration,
- Reports can be printed to a printer connected to the NAM, to a text file that is sent to the PC, or to a diskette,
- On-line help with key word search,
- Remote access to Norstar Voice Mail and its optional applications.

Hardware Requirements

In order for Norstar Voice Mail Manager to be installed successfully, the customer site must have either a NAM I or NAM II, an ethernet LAN card and at least 16 MB of RAM. The network must be running TCP/IP over Ethernet between the NAM and the client PCs. Each of the client PCs must be equipped with a LAN card and one of the following operating systems:

- Windows™ 95 or Windows™ 98,
- Windows™ NT 4.0.

Software Installation

Norstar Voice Mail Manager assumes that Windows™ 95/98 client PCs have TCP/IP inter-networking capability, which is bundled with Windows 95/98 and Windows NT operating systems. The NAM must be at Norstar Voice Mail 3.0 software and must be equipped with a minimum of 16 MB RAM.

Norstar Voice Mail Manager is installed on the client PC from floppy disks that provide an installation utility which guides the user through the installation process. The installation process has the same look and feel as any Windows-based setup program. When the Norstar Voice Mail Manager application runs the first time, it will set the default Norstar Voice Mail Manager language to the NAM's primary language. Norstar Voice Mail Manager is enabled on the NAM using a software keycode.

Norstar Voice Mail and the AMIS Option

AMIS (Audio Messaging Interchange Specification) is the voice processing industry solution for networking remote voice mail systems provided by different vendors. The AMIS option of Norstar Voice Mail allows the messaging community at one Norstar location to send and receive messages from other messaging communities that support the AMIS protocol.

Each user can be reached via their AMIS address, which is a system access number (basically the telephone number of their local system) and their mailbox number. There are three methods by which mailbox owners can send messages to mailboxes in other locations within the AMIS network. All of these methods can designate special time periods and lines on the Norstar Voice Mail system to reduce long distance costs when sending messages.

The AMIS market targets the following customers:

- Customers with multi-site operations,
- Customers with voice messaging systems from multiple vendors, and
- Single-site customers whose primary business associates have AMIS capabilities.

Benefits of AMIS

Time and cost savings are two of the most important benefits of AMIS. Hard dollar savings that would improve a company's bottom line include:

- Delay in sending of messages until lines are less busy,
- Delay in sending of messages until long distance rates are cheaper,
- Easier access to all people within the network,
- Network wide group lists,
- Network wide broadcast messages, and
- Network wide reply to messages.

There are three ways in which messages can be sent:

- Direct Addressing,
- Network Delivery Mailbox,
- Site Based Addressing—introduced with the Norstar Voice Mail Release 3.0.

Direct Addressing

Direct Addressing allows a user to send a message to any mailbox in the network by entering the parameters required by Norstar Voice Mail to reach the destination mailbox. These parameters include:

- The telephone number of the destination site, and
- The destination mailbox number.

Network Delivery Mailbox

The Network Delivery Mailbox stores the parameters required by Norstar Voice Mail to reach the destination mailbox, including the telephone number of the destination site, which line or pool number Norstar Voice Mail uses to make the call and the destination mailbox number.

A person leaving a message simply records the message and sends it to the Network Delivery Mailbox. The Network Delivery Mailbox then automatically contacts the intended recipient's personal mailbox and delivers the message.

For this delivery method, a Network Delivery Mailbox must be set up in Norstar Voice Mail for every person in the network to whom employees would want to send a message.

Rules for AMIS to function

- Norstar Voice Mail must have Release 2.0 software or greater.
- AMIS software must be enabled at all locations.
- The Auto Attendant must answer the calls from other Norstar Voice Mail systems.
- To send a message using Network Delivery Mailboxes, a Network Delivery Mailbox must be set up for each person in the network that is to receive messages.

Norstar Voice Mail and the Fax Application Option

The Fax application option works with Norstar Voice Mail 2.0 or higher to provide the following incoming and outgoing fax capabilities:

- Fax Mail,
- Fax-On-Demand,
- Fax Broadcasting,
- Fax Overflow,
- Fax Answering.

The Digital Fax Card (DFC) is a hardware component for Norstar Voice Mail. On a NAM II, MS-BIC based system, the DFC is installed in an expansion slot on the Norstar Applications Module and uses the voice channels on the MS-BIC, connecting to the MS-BEC (Media Services Bus Expansion Card) using a PEB cable. On NAM I and DVC-based NAM II systems, the DFC uses voice channels on the Digital Voice Card (DVC) and connects to the DVC using a PEB cable.

The fax application is provided by adding a digital fax card and enabling the fax software option. The fax software option provides 2 or 4 channels of Fax.

It is important to note that fax messaging does not require dedicated voice channels. Fax messaging shares the voice channels with Norstar Voice Mail and can use any of the 16 voice channels when required. This means that on a 16 channel Norstar Voice Mail with 4 channels of fax installed, there are still 16 channels of Voice Mail available when the fax is not in use.

Most competitive systems require dedicated channels for fax. In other words, competitive systems would reduce the number of voice channels available to 12, even when fax is not in use.

Fax Mail

The fax machine is as commonplace in today's business environment as the telephone. The ability to transmit hard copy information instantly anywhere in the world has heightened expectations for speed and accuracy of communications. Even with other available technologies, many organizations still rely on facsimile as a primary form of communications with customers, suppliers and employees, especially when hard copy documents are required.

With Fax Mail, incoming faxes are stored electronically as "fax messages" in a user's voice mailbox just as a voice message is stored. Fax mail can be forwarded to another mailbox, directed for printing to any fax machine in the world, or sent to a preprogrammed fax destination. Fax Mail becomes an even more powerful tool when it is used in conjunction with Desktop Messaging since the user can view the fax on their PC screen without having to print it out and go get it from a fax machine or printer. They can also forward the fax on to others, or file it in an appropriate folder.

Fax-on-Demand

The Fax-on-Demand (FOD) feature provides the ability for a caller to retrieve a fax document 24 hours a day, 7 days a week, from an “electronic library” of information previously stored in a special FOD mailbox. FOD reduces documentation and distribution costs and also improves the organization's image and customer service because of the quick response callers get to information they need.

Fax Broadcasting

Fax Broadcast allows a fax to be sent to multiple destinations, internal and external, by creating one message and addressing it to a fax broadcast group list. There can be 99 Fax System Group Lists and each can contain 125 member numbers. Fax Broadcast is a very efficient and cost-effective way to send hard-copy information to many individuals or to stay in touch with important customers, and maybe even solicit some new business.

Fax Overflow

Is like having a “virtual” fax machine and significantly reduces the likelihood of an incoming fax encountering a busy or no-answer condition. If the destination fax machine is busy or out of paper, the document is stored in a Fax Overflow mailbox on the Norstar Voice Mail system. The stored faxes are then sent from the mailbox to the original fax machine destination when it is once again accepting calls.

Fax Answering

Fax Answering means that the system at the auto attendant level can recognize fax tone and receive faxes sent to the main company number. This feature works well with the Fax Overflow mailbox, providing improved coverage and reception for faxes. With Fax Answering, an organization can avoid the ongoing cost of a dedicated telephone number to receive their faxes.

All of these fax capabilities take advantage of the tight integration with the Norstar ICS and use the LCD window on the telephone sets to make fax processing simple, minimizing training costs for employees, and providing powerful technology tools for any organization.

Norstar Voice Mail Reports for Fax Information

Fax information is shown in two of the Norstar Voice Mail Reports. The two reports are:

- **Directory Report:** identifies Fax-On-Demand and Fax Overflow mailboxes. This report lists the mailbox type, owner's name, extension number, and whether or not the mailbox is included in the company directory and if a greeting has been recorded.
- **Fax-On-Demand Usage Report:** identifies which points on the CCR tree are Fax-On-Demand mailboxes and how many times users have retrieved documents from these mailboxes. This report lists the points on the tree, assignments made to the points and any areas that need administering. The report also shows the points on a tree and the number of times a point was accessed.

Norstar Voice Mail and the Dial-by-Name GUI Application

Dial-by-Name is an electronic phone book, accessible by every set in the Norstar system. Dial-by-Name GUI offers a graphical user interface for easier administration. The graphical user interface allows a database to be imported from other applications like Excel, Lotus and Word, using the monitor and keyboard. As well, the GUI component allows a directory to be created and updated via the keyboard.

The Dial-by-Name GUI application is bundled with Norstar Voice Mail 4.0 and runs on the Norstar Applications Module.

Dial-by-Name GUI allows phone numbers to be stored on the Norstar Applications Module and to be accessed on the Norstar Display by spelling the name of the person using the telephone dialpad.

Note: Each 100 entries requires 35K of hard drive space; 1MB of memory uses approximately 4 minutes of storage time.

Designed by Cintech Tele-Management Systems, Dial-by-Name GUI greatly increases the functionality and power available to the user. It is available in French and English, and can be used for both internal and external dialing.

A maximum of 10 phone books from five different templates are available on Dial-by-Name GUI. The five templates available are:

- Standard,
- Business,
- Personal,
- Phones,
- Product.

Note: Templates cannot be deleted.

Dial-by-Name GUI is suited for businesses who wish to supplement their auto dial capability on Norstar, such as:

- School System - parents' names, work numbers, home addresses;
- Manufacturing Company - suppliers, branch offices, customers, product prices;
- Doctor's Office - hospital numbers, doctor names, beeper numbers.

Norstar Voice Mail and the Desktop Messaging Application

Desktop Messaging Application Overview

Note: Norstar Voice Mail systems must be equipped with the Fax Messaging application to take advantage of the fax applications used in combination with Desktop Messaging.

Information overload is a real problem in today's workplaces. Every day, workers wade through stacks of faxes and must review, respond to, or otherwise deal with innumerable voice and e-mail messages - one at a time. Communications via fax in North America is increasing annually at 40 percent and there are an estimated one billion-voice mail messages and 1.5 billion e-mail messages received daily in the workplace. The need for an effective message management tool has never been greater.

Norstar's Desktop Messaging allows users to manage all their voice, fax and e-mail messages from the convenience of their multimedia equipped PC or laptop. Norstar has created a message management tool that is feature-rich, easy to use, and provides users the capability to view and listen to all of their messages on their desktop or to retrieve them from any remote location.

Desktop Messaging also provides improved organizational communication and increased levels of productivity. Because users can access all of their messages in one session locally or remotely, view fax messages prior to printing, and prioritize which messages they access, they will spend less time on message management and more time on the aspects of their job, which drives contributions to their organization.

Another advantage of Desktop Messaging is that an organization can maximize the investment they have already made in desktop equipment and in their LAN. And since fax messages can be viewed before printing, many faxes will just be read and not printed at all. Fax messages can also be sent to any printer on the LAN directly from the PC, which will significantly reduce the need for individual fax modems and analog connections.

Desktop Messaging Description

The Desktop Messaging product has both a server and a client component. The NAM is connected via the on-board Ethernet port or a customer-provided Network Interface Card (NIC) to the local computer network and the Desktop Messaging software runs on the NAM and communicates with client software installed on each user's PC. Desktop Messaging integrates with Microsoft Exchange and Outlook client e-mail applications and fully complies with the Microsoft Exchange/Outlook user interface for handling attachments, message reply, and other functions.

Since Release 3.0 in September 1997 (and with Release 4.0) every new voice mail system shipped has the capability to support two seats of Desktop Messaging. This means that after the NAM is configured for the customer's network and the Desktop Messaging Client Installation Package is installed on the PCs, the customer can effectively "trial" this application to determine its value to their organization.

Desktop Messaging User Interface

To access the voice mailbox, the user launches Microsoft Exchange, is presented with a login dialog box, and is prompted to enter their mailbox password. Upon installation of Desktop Messaging on a user's PC, a new mailbox called "Nortel Message Store" will be added to the set of mailboxes. Once the user has logged on to Microsoft Exchange/Outlook, the standard Microsoft Exchange/Outlook mailbox viewer will be presented, which gives access to the mailbox/folder screen. The user can then open and view the contents of mailboxes, folders, and messages.

The Desktop Messaging user interface is modeled after a standard established by many existing e-mail applications. Microsoft Exchange/Outlook uses a set of folders to manage e-mail messages and the Desktop Messaging application uses that same folder method to manage voice and fax messages stored in the voice mailbox.

A traveling user or telecommuter can access the desktop interface from a laptop computer through a dial-up connection to the PC network and take advantage of Desktop Messaging functionality. One obvious benefit to travelers is that Desktop Messaging provides the capability to view fax messages on the lap top screen. The often expensive per-page printing charges that most hotels charge can be avoided.

Desktop Messaging Installation

In order for the NAM to communicate on the LAN and provide access to the Norstar Voice Mail mailbox, either the onboard Ethernet port is used (available only on new Release 4.0 systems) or a Network Interface Card (NIC) is installed in the NAM. Note: Installation of the NIC requires a keyboard, monitor, and SVGA card or the NAM/IP Setup Package. The Norstar distributor or the customer LAN administrator installs and configures the NIC for Desktop Messaging. The NIC must be provided by the customer and must be one of the NICs listed in the Digital Networking section of this document.

Desktop Messaging Features

From the desktop, the user can:

- Reply or reply to all messages,
- Save any message,
- View the message envelope information,
- File messages,
- Use the Help menu and access topics on Desktop Messaging,
- Receive notification of new messages while logged on to Exchange,
- Print text messages
- Create new messages (either text or verbal) using the Compose Message command,
- Create personal address book entries and lists,

- Change mailbox password,
- Prioritize and sort messages by:
 - Classification (for example, urgent, certified, normal),
 - Date and time,
 - Sender,
 - Subject
- Play voice messages,
- Record voice messages,
- Forward, send, reply to, save, delete and archive voice and fax messages,
- Add voice annotations to fax messages,
- View fax messages.

Norstar Voice Mail Digital Networking and VPIM Option

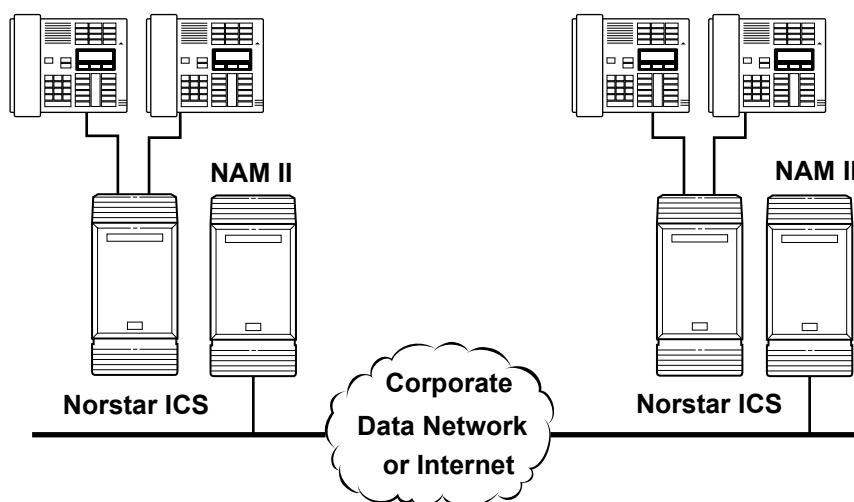
Networking would not be important if everyone worked in one building and used one system for every kind of communication. But, people are working within broader and broader groups, both inside and outside their company, which means that networking is becoming an essential technology.

With Digital Networking technology, the sound quality of the sender's voice is not diminished by the quality or bandwidth of the transmitting circuit as it typically is with analog networking, like AMIS. With Digital Networking, voice and fax messages are encoded, condensed and transmitted as data files, and sent from location to location using techniques that assure reliability. When the message arrives at the final destination, it is decoded and presented to the user as a normal voice or fax message - with the clarity that the sender intended.

Norstar Voice Mail Release 4.0 systems with Digital Networking will be able to send voice, fax and text messages to other Release 3.0 and 4.0 systems. In addition to providing efficient message exchange between Norstar Voice Mail systems, Digital Networking can be used between Norstar Voice Mail Release 3.0 or 4.0 systems and Meridian Mail systems equipped with Meridian Mail Net Gateway and Enterprise Networking software to digitally network voice messages.

The principal benefits of Digital Networking are:

- Cost-effective use of network resources for both voice and data transmission,
- Reduces network usage by sending message one time to multiple remote recipients at one location,
- Faster transmission reduces transmission time and cost,
- Norstar and Meridian Mail networking enhances enterprise customer communications.



Digital Networking Benefits

Customers do not want the expense of maintaining separate voice and data networks. Since voice and fax messages are sent as data files, Digital Networking will allow them to use their existing data networks as the transport for fax and voice messages, including their LAN/WAN environment, or even the internet, can be used to connect voice messaging systems.

Benefits include:

- High quality of the message improves communications,
- Use of network resources for both data and voice transmission is cost effective,
- Network usage is reduced by sending messages one time to remote recipients at one location,
- Faster transmission improves communication and reduces transmission time,
- Norstar and Meridian Mail enhances enterprise customer network messaging,
- Time is saved by recording a message once and addressing it to multiple recipients,
- Flexibility,
- Transparency of communication,
- A message can be forwarded to an individual using only 4 digits, as if they were down the hall,
- Companies with several branches all appear to be the same (ie. forwarding and replying to messages) because of the standardization of “look and feel”.

Software Installation

Norstar Digital Networking is an optional application that is installed after Norstar Voice Mail 3.0 has been installed. The software is enabled with a software keycode.

Digital Networking Features

- **Forwarding Network Messages**—Network messages can be forwarded to other local users, however, the message envelope of the originator of the network message is not preserved and forwarded with the message. Only the body of the message will be forwarded.
- **Reply to Network Messages**—The recipient of a network message can reply and create an outgoing network message that is already addressed to the originator. The replier can also assign message delivery options before sending the message.
- **Delivery Options**—Network messages can be specified as certified, urgent and private and are implemented in exactly the same way as for local messages.
- **Non Delivery Notification (NDN)**—When an error of some type occurs preventing delivery of a network message, a network NDN is generated by the remote system (the system intended to receive the message). If a network message is addressed to multiple sites in a network and some sites cannot receive the message, other sites in the same network recipient lists can still receive the message successfully.

Digital Networking Description

To digitally network between Norstar Voice Mail Systems, each system on the network must use the on-board Ethernet port or be equipped with a customer provided separately installed NIC. Note: Installation of the NIC requires a keyboard, monitor, and SVGA card or the NAM/IP Setup Package. It is the responsibility of the distributor or customer to provide and configure the NIC.

Norstar supports the following separately installable NICs to support Digital Networking:

BUS	Supplier	NIC Card	Model number
ISA	3COM	EtherLink III	3C509B
	3COM	Fast EtherLink	3C515
	Hewlett-Packard	DeskDirect 10/100VG	J2573A
PCI	3COM	Fast EtherLink XL 10/100	3C 595-T4
	3COM	Fast EtherLink XL	3C 905-T4
	D-LINK	Ethernet	DE-530CT
	GVC	10BaseT PNP	2006BT
	Hewlett-Packard	DeskDirect 10.100VG	J2585A
	IBM	Pro 100/10 etherJet	86H2432
	Intel	EtherExpress Pro 100	PCLA8465B
MaxTech	10/100 combo	NX-110PCI	

Voice Profile for Internet Mail (VPIM)

Norstar Digital Networking uses standard TCP/IP protocols. Voice, fax and text messages are exchanged using Simple Mail Transfer Protocol (SMTP) with a subset of the Multipurpose Internet Mail Extension (MIME) specification being used to map the Norstar Voice Mail message format to the network mail format. Use of these Internet standards allows easy expansion of this feature to comply with the Electronic Messaging Association (EMA) Voice Profile for Internet Mail (VPIM) standard. To support VPIM, the NAM must be equipped with a NIC and connected to the customer's network.

VPIM is an emerging messaging standard that allows voice and fax messaging among unlike vendors' messaging systems over the Internet. Vendor certification is managed within the voice messaging work group as part of the EMA. In order to be VPIM compliant, a vendor must successfully test their VPIM software with two other vendors. As of this writing, Nortel Meridian Mail, Nortel Norstar Voice Mail, Centigram and AVT are VPIM compliant.

Digital Networking Administration

As stated earlier, the NAM must be equipped with a NIC that must be configured with the appropriate TCP/IP networking parameters. The NIC manufacturers provide a configuration utility and installation instructions, which must be followed by a distributor installer or customer LAN administrator who is competent in the installation of TCP/IP networks.

Flash Voice Mail

Flash Voice Mail is designed for small businesses looking for a reasonably-priced, feature-rich voice processing system.

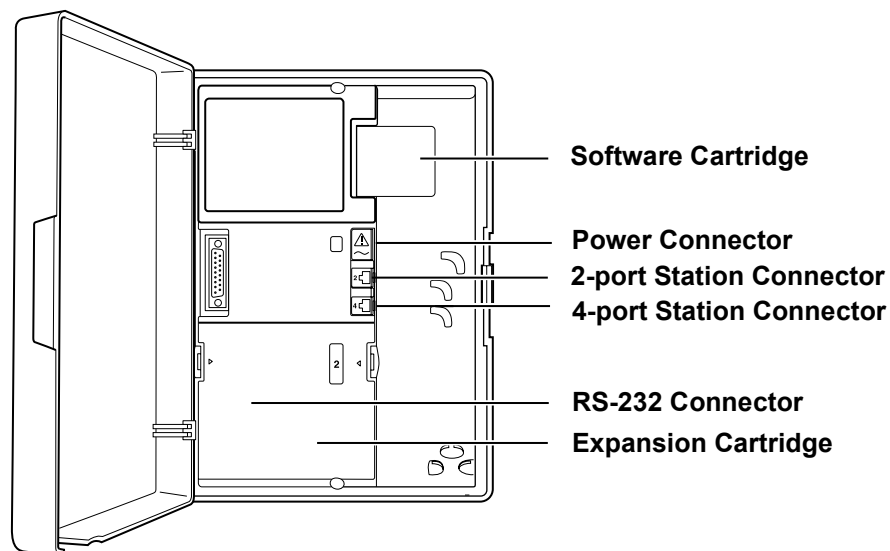
Flash Voice Mail provides

- 24 or 48 mailboxes,
- 2 Greeting Tables,
- 20 greetings,
- 2 CCR Trees,
- 2 CCR levels,
- 5 programmable numbers for Off-premise Notification.

Flash Voice Mail Benefits to the Customer

- Cost-effective voice mail and auto attendant product,
- Simplicity and reliability,
- State-of-the-art technology
 - CLID,
 - Enhanced Norstar integration,
 - Interrupt feature
- 2- and 4-channel models,
- Product to meet 3X8, Compact and small Modular needs,
- Reliability and flash memory.

Flash Voice Mail Architecture



Software Feature Cartridge:

- Is removable, contains the voice messaging software and system voice prompts,
- Consists of a Personal Computer Memory Card International (PCMCIA) Read Only Memory (ROM) Card.

Power Supply:

- Converts AC line voltage to +5 Volts DC,
- Is connected to the Flash Voice Mail module using a 5-pin DIN connector.

Station Port Connection:

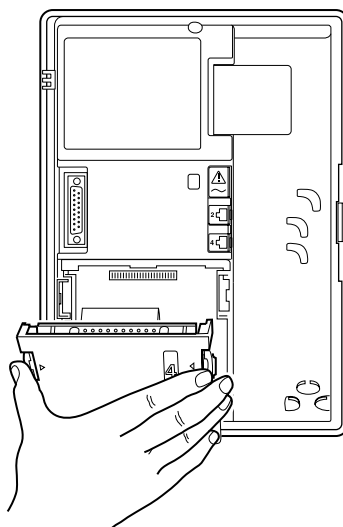
- 2-port: station port connection for the Flash Voice Mail model 2 system,
- 4-port: extra station port connection required for the Flash Voice Mail model 4 system. (Must have the four voice channel expansion cartridge installed).

RS-232 port:

- Used to connect a serial printer or terminal.

Expansion Cartridge:

- Allows the module to be upgraded from a two voice channel system to a four voice channel system.



Flash Voice Mail Models

Model 2	Model 4
2 voice channels	4 voice channels
90 minutes of storage	180 minutes of storage
24 mailboxes	48 mailboxes

Two-channel Expansion Module upgrades a Model 2 to a Model 4.

Expanding Flash Voice Mail

Upgrading requires an Expansion Cartridge, which provides:

- Two additional voice channels,
- An additional 90 minutes of message storage.

When upgrading, all user programming will remain intact.

Flash Voice Mail Light

Flash Voice Mail Light includes 12 mailboxes (10 user and 2 general delivery), 90 minutes of storage, and the Flash Voice Mail feature set, with the exceptions of Custom Call Routing and Auto Attendant.

With Flash Voice Mail Light, voice mail is economical for even the smallest company, and investment protection is provided by the easy expansion capability.

Upgrading

Flash Voice Mail Light can be upgraded with a keycode to Flash Model 2. This upgrade provides 12 additional mailboxes, as well as the Custom Call Routing and Auto Attendant features.

Once the unit has been upgraded to Flash Model 2, it can be upgraded to a full functioning Flash Model 4, with the Model 2 to Model 4 upgrade kit. This upgrade path provides convenient growth from 12 to 48 mailboxes in three different stages.

Norstar Voice Mail and Flash Voice Mail Messaging Feature Comparisons

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Administration							
Administer DTMF recognition from a set	√	√	√	√	√	√	√
Administer DTMF recognition from an RS232 terminal (from the top level menu)	√	√	√	√	√	√	√
Backup and Restore (using high density disks)			√	√	√	√	√
Create Mailbox Utility					√	√	√
Custom directory						√	√
Enable/Disable Port				√	√	√	√
Expedited Record Time-out						√	√
Flexible feature code assignment	√	√	√	√	√	√	√
Line renumbering utility for Modular ICS RIs 2/Compact ICS RIs 2						√	√
More than one set access administration	√	√	√	√	√	√	√
Terminal Administration (Mailbox, Group list, Admin only)	√	√	√	√	√	√	√
AMIS Networking							
Direct addressing				√	√	√	√
Network delivery mailbox addressing				√	√	√	√
Site based addressing						√	√
Automated Attendant Programming							
Call Transfer—Blind		√	√	√	√	√	√
Call Transfer—Screened						√	√
Caller Display				√	√	√	√
Calling Name Display			√	√	√	√	√
CCR levels		2	10	10	10	10	10
CCR trees		2	4	4	4	4	4
Change Flash Voice Mail's primary language		√	√	√	√	√	√
CLID recognition		√	√	√	√	√	√
Custom Call Routing (single digit dialing)		√	√	√	√	√	√
Customized AA greeting per greeting table		√	√	√	√	√	√
Dual language system support		√	√	√	√	√	√
Dial Extension number from CCR		√	√	√	√	√	√
Distinguish weekdays vs weekends (as pertains to business hours)		√	√	√	√	√	√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
External link transfer, single trunk		√ (2.0)					√
External transfer on Centrex			√	√	√	√	√
Flexible business hours per greeting table		√	√	√	√	√	√
Flexible business hours (system wide)		√	√	√	√	√	√
Flexible line ringing to AA using Norstar DRT		√	√	√	√	√	√
Flexible line ringing to AA within Flash Voice Mail programming		√	√	√	√	√	√
Multiple Operators (Dial 0) on a greeting table basis		√	√	√	√	√	√
Name Display			√	√	√	√	√
Remotely Record Company Greeting				√	√	√	√
Remotely Set Business Open/Close				√	√	√	√
Reply based on CLID		√	√	√	√	√	√
Single Digit Menus		√	√	√	√	√	√
Speech recognition Auto-Attendant							√
Touch tone gate for Auto-Attendant/CCR						√	√
Turn AA main menu prompts on/off		√	√	√	√	√	√
Turn global trunk answering on/off		√	√	√	√	√	√
Desktop Messaging							
Client application support on Windows NT						√	√
Client application support on Windows 95						√	√
Client application support on Windows 98							√
Compose/edit fax cover page						√	√
Compose/edit fax messages						√	√
Fax message manipulation (save/forward) on client PC						√	√
Fax message voice annotation						√	√
Fax message waiting indication on client PC						√	√
Prioritize messages by attribute of choice						√	√
Receipt/delivery of messages from MAPI 1.0 servers						√	√
Receipt/delivery of voice, fax and simple text via NAM						√	√
Toolbar for frequently repeated functions						√	√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
View fax from client PC						√	√
Visual display of commands via menus and icons						√	√
Voice message manipulation (save/forward etc.) on client PC						√	√
Voice message playback on PC						√	√
Voice message recording on PC						√	√
Voice message waiting indication on PC						√	√
Digital Networking							
Delivery options						√	√
Forward Network Messages						√	√
Network delivery mailbox addressing						√	√
Non delivery notification						√	√
Reply to Network messages						√	√
Site based addressing						√	√
VPIM (Voice Profile for Internet Mail) compatible						√	√
Fax Programming Option							
Fax Answering				√	√	√	√
Fax Broadcast				√	√	√	√
Fax line					√	√	√
Fax Load via Diskette				√	√	√	√
Fax Load via Desktop Messaging							√
Fax Mail				√	√	√	√
Fax-On-Demand				√	√	√	√
Fax Overflow				√	√	√	√
Maximum Fax Ports				4	4	4	4
Simplified fax printing at off-site locations						√	√
Group List programming							
Administer group lists leading digit	√	√	√	√	√	√	√
Group lists	√	√	√	√	√	√	√
Max. Group lists	2	2	99	99	99	99	99
Max. members to a group list	12	24, 48	500	999	999	999	999
Turn group lists on/off	√	√	√	√	√	√	√
View group list members	√	√	√	√	√	√	√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Mailbox programming							
Assigning Target Attendants			√	√	√	√	√
Auto Answer with personal greeting	√	√	√	√	√	√	√
Automatic reply to Internal Messages	√	√	√	√	√	√	√
Broadcast messages	√	√	√	√	√	√	√
Called party cancellation of Off-site notification						√	√
Cascading off-Premise Message Notification	√	√	√	√	√	√	√
Classes of service	8	8	16	16	16	16	16
Classes of service administration					√	√	√
Dial 9 in mailbox to change language prompts	√	√	√	√	√	√	√
Enable or disable General Delivery mailbox	√	√	√	√	√	√	√
Envelope information	√	√	√	√	√	√	√
Express Internal messaging	√	√	√	√	√	√	√
Forward copy with or without comment	√	√	√	√	√	√	√
General Delivery mailboxes	√	√	√	√	√	√	√
Group distribution lists	√	√	√	√	√	√	√
Guest mailboxes	√	√	√	√	√	√	√
Informational mailboxes	√	√	√	√	√	√	√
Internal notification–intercom	√	√	√	√	√	√	√
Mailbox number 2-7 digit length	√	√	√	√	√	√	√
Maximum characters in mailbox name	16	16	16	16	16	16	16
Message delivery options	√	√	√	√	√	√	√
Message saving (archive messages)	√	√	√	√	√	√	√
Message waiting notification	√	√	√	√	√	√	√
Multiple target attendants			√	√	√	√	√
Name confirmation when sending	√	√	√	√	√	√	√
Name directory or extension access	√	√	√	√	√	√	√
Never Full Mailboxes				√	√	√	√
Off-site notification - pager/phone	√	√	√	√	√	√	√
Off-site notification Numbers	5	5	5	5	5	5	5
Outbound Transfer From Mailbox				√	√	√	√
Personal primary greeting automatically chosen (after being recorded)	√	√	√	√	√	√	√
Playback controls	√	√	√	√	√	√	√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Prerecorded Greetings storage	√	√	√	√	√	√	√
Preview Caller Display Information				√	√	√	√
Primary and Alternate greetings	√	√	√	√	√	√	√
Recover Deleted Messages				√	√	√	√
Remote Call Forward to Voice Mail				√	√	√	√
Saved message queue and retention periods	√	√	√	√	√	√	√
Simplified Off-site notification setup						√	√
System Coordinator mailbox	√	√	√	√	√	√	√
Turn Return to AA on/off (using AA menu after leaving a message in a mailbox)		√	√	√	√	√	√
Trouble mailbox	√	√	√	√	√	√	√
Urgent Message Notification				√	√	√	√
Zero as a leading digit in mailboxes	√	√	√	√	√	√	√
Miscellaneous							
Baud Rate (default)	1200	1200	1200	1200	1200	1200	1200
Call Screening per set						√	√
Disable receiving of messages/set						√	√
Dynamic voice channel allocation	√	√	√	√	√	√	√
Enable or Disable Company Directory	√	√	√	√	√	√	√
Enable or Disable Voice Mail feature	√	√	√	√	√	√	√
Enter extension at any point in a CCR tree		√	√	√	√	√	√
External volume control while listening to messages	√	√	√	√	√	√	√
Interrupt feature	√	√	√	√	√	√	√
Max voice port for pager off premises notification	2	2, 4	8	16	16	16	16
Multiple recipients per message						√	√
Record a Call (Feature 989)							√
Redirected DN for ISDN lines						√	√
Remote upgrade capability						√	√
Semi-interruptible greetings						√	√
Simplified Transfer (Feature 986)	√	√	√	√	√	√	√
Single Button Call Forward to Voice Mail (Feature 984)							√
Single Trunk External Link Transfer							√
Speech Recognition Voice Activated Dialing (Feature 988)							√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Timed delivery of messages						√	√
Transfer call externally (caller dials a single digit in the tree)	√	√	√	√	√	√	√
Transfer to CCR tree		√	√	√	√	√	√
Transfer to guest mail box using CLID	√	√	√	√	√	√	√
Transfer to guest mailbox using extension	√	√	√	√	√	√	√
Trunk answer on/off	√	√	√	√	√	√	√
Turnoff General Delivery Mailbox option	√	√	√	√	√	√	√
Turnoff Voice Mail Option	√	√	√	√	√	√	√
Voice channel sharing						√	√
Voice Mail option	√	√	√	√	√	√	√
Norstar Voice Mail Manager							
Client support on Windows NT						√	√
Client support on Windows 95						√	√
Client support on Windows 98							√
Graphical user interface for system admin (excluding prompts and CCR tree)						√	√
NVM Mailbox Manager for user mailbox admin							√
NVM Manager administration via network connect						√	√
NVM Manager administration via PPP connect						√	√
NVM Operator Manager for auto attendant admin							√
Reports							
Alphabetical Subscriber		√	√	√	√	√	√
Call Handling and Channel Usage						√	√
CCR Tree configuration		√	√	√	√	√	√
CCR usage						√	√
CLID dialing Table	√	√	√	√	√	√	√
Combined Mailbox Activity and Numeric Subscriber						√	√
Directory Report	√	√	√	√	√	√	√
Downloadable Reports (requires NVM Manager)						√	√
Fax on demand Usage Report						√	√
Group lists Report	√	√	√	√	√	√	√
Message Usage Report	√	√	√	√	√	√	√

	Flash Voice Mail Light	Flash Voice Mail	VM 1.0	VM 2.0	VM 2.1	VM 3.0	VM 4.0
Mailbox Activity Report	√	√	√	√	√	√	√
Numeric Information Mailbox Report (formerly Numerical Subscriber Report)	√	√	√	√	√	√	√
Reset mailbox activity report statistics	√	√	√	√	√	√	√
System Configuration Report providing options, lines, greeting tables at al						√	√
Security							
Centrex Transfer Restrictions				√	√	√	√
Change Operator Password	√	√	√	√	√	√	√
Double entry of new passwords						√	√
Forced Password Change				√	√	√	√
Incorrect Password Detection/Lockout				√	√	√	√
Internal Norstar Set Initialization				√	√	√	√
Outbound calls restricted to preset line/pool						√	√
Reset mailbox passwords	√	√	√	√	√	√	√
Reset OPERATOR password	√	√	√	√	√	√	√
Reset system coordinator password	√	√	√	√	√	√	√
Set based restrictions for outbound calls						√	√
Speech Recognition Option							
Speech Recognition Auto-Attendant							√
Speech Recognition Voice Activated Dialing (Feature 988)							√

Features and Benefits

Refer to the Feature Comparison chart for the features each product supports.

Administration

Backup and Restore

Data backup and restore applies to all system configuration attributes, but not voice mail messages.

Data is saved in the event of system operational problems.

Create Mailbox Utility

The Create Mailbox Utility, when activated, seeks out all the Norstar ICS extensions that do not have mailboxes and will create mailboxes for these extensions with the following default characteristics:

- The mailbox number, which is the same as the extension,
- The name, if available from the ICS,
- The directory listing, if available from the ICS,
- Yes, for message waiting.

The other mailbox characteristics must be designated by the system administrator, but having the mailboxes automatically configured will save the system administrator time. The automatically setup mailboxes will be uninitialized. The final display on the administering telephone set will show the number of mailboxes created. This display must be acknowledged by the administrator to complete this function.

Create Mailbox Utility will not create mailboxes under the following conditions:

- A mailbox with the same number already exists,
- The extension is used by some other mailbox, or

- The extension is identified as a voice mail channel or other “system” extension.

Speeds up mailbox configuration and makes administrator’s job easier.

Custom directory

The Custom directory provides the capability to have name matches looked up in the directory by first name, last name or both names.

Regardless of which name is used to search, names are always entered in the format of “last name, first name” and the directory search parameter can be changed without reentering the names.

Enable/Disable Port

The administrator, when necessary, can disable a particular port in the course of diagnosing or containing a system problem. After the problem is solved, the administrator can enable any previously disabled port.

Expedited Record Time-out

Prior to Norstar Voice Mail Release 3.0, when callers reached a mailbox and silence was detected by the system, the caller was twice given a set of prompts (asking the caller to speak up, speak directly into the phone or for more options, press #). With Release 3.0, the system allows one retry after silence is recorded and the prompts have been shortened.

This should reduce holding time and helps to maximize system channel usage.

Line renumbering utility for Modular ICS RIs 2, Compact ICS RIs 2

If the Norstar Voice Mail system is connected to a Modular ICS or Compact ICS, and the ICS

software is upgraded to version 2.0, the Norstar Voice Mail lines must be renumbered. Renumbering the Norstar Voice Mail lines is divided into two parts:

- Running the line renumbering utility,
- Resetting the Line Answer status.

Line renumbering can be done from a Norstar M7310 or M7324 two-line display telephone using the Line renumbering utility.

Terminal Administration

For selective system administration, the coordinator can use a terminal connected to the voice mail system instead of a Norstar set; administration can occur either on-site or off-site via a modem.

A coordinator has better control of remote systems; this feature also saves money, because one person can be assigned to manage several systems.

AMIS Networking

Direct addressing

Direct addressing allows a user to send a message to any mailbox in the network by entering the parameters required by Norstar Voice Mail.

Network delivery mailbox addressing

The Network Delivery Mailbox stores the parameters required by Norstar Voice Mail to reach the destination mailbox.

Makes it faster and easier for the user.

Site based addressing

Site-based addressing allows a subscriber to send voice messages to remote voice mail systems using the site address.

Maximizes the use of mailboxes on the system versus using the network delivery method, which requires a mailbox for every person at the remote site.

Automated Attendant Programming

AA menu prompt

Can be turned on or off for each greeting table.

Call Transfer – Blind

A call can be transferred directly to an extension with ringing starting immediately.

Call processing is faster.

Call Transfer – Screened

Callers are first prompted to record their name, which is then played at the dialed extension; the call is then accepted or rejected without the caller's knowledge.

A called party can avoid unnecessary interruptions

Caller Display (Call Screening support on Call Forward)

When Call Forwarding is enabled, all incoming calls are immediately forwarded to voice mail. When the mailbox owner designates that they want to see caller information displayed at their telephone set, the display will show the name (or number) of the caller, as provided by the central office. This information is displayed and accompanied by an alert tone when the call is being forwarded to voice mail.

Enables user to work uninterrupted when required but still take certain essential calls.

Calling Name Display

The calling name will be stored with the message if Norstar is equipped with CMS/CLASS and Name Display is delivered by the telco.

CLID Dialing Table Report

Lists all entries in the Call ID table. Each entry contains a telephone number, destination type and destination number.

Dial Extension Number from CCR

Any extension number can be dialed from any menu point on a Custom Call Routing tree.

Customize the AA menu prompt per greeting table

Customized for each greeting table to assign greetings to tables.

Dual Language System Support

Callers and users can switch between two languages at either the auto attendant or personal greeting level of system prompts.

Companies can use the language of their business. (English or French in Canada; English or Spanish in the U.S.)

External Transfer on Centrex

A multi-site company can transfer callers between locations.

External Link Transfer, Single Trunk

(See Miscellaneous - Single Trunk External Link Transfer)

Flexible Business Hours for Company Greetings

Prerecorded morning, afternoon and evening greetings can match a company's business hours. Can be assigned to a specific greeting table for specific time of day and for each day of the week rather than on a system-wide basis.

Customer service is improved by eliminating any confusion over hours of operation. Very efficient at routing internal communications.

Flexible Line Rings for Auto Answer

Calls are transferred after a preset number of rings. Users can customize the system to meet their individual needs.

Greeting Tables

Greeting Tables are available for a company to customize the answering of its incoming lines.

Customers receive the appropriate time-of-day greeting. Also allows a company to customize greetings by department.

Multiple Operators

Once the dial "0" is assigned for a specific greeting table, it will override the designated operator defined in Feature 982.

Personal Greetings based on CLID

A personal greeting is played to Calling Line ID callers only. A mailbox subscriber can program up to 3 specific telephone numbers, each with its own greeting.

Increased flexibility and customer service.

Remote Administration Menu:

- Remotely Record Company Greeting,
- Remotely Set Business Open or Closed

From this menu, the administrator can change any company greeting or remotely set the business open or closed. Using Feature 983, the administrator identifies the greeting to be changed and can then play, record, re-record and accept the changed greeting.

These functions are especially beneficial for severe weather or disaster conditions.

Reply based on CLID

Used for automatic replies to numbers collected from CMS/CLASS. Norstar Voice Mail will dial CLID with message by simply pressing the "call" softkey.

Routing Calls based on CLID

The system coordinator can assign up to 100 unique telephone numbers to the Calling Line ID table. Each telephone number is given a destination type. The destination type determines where the call will be routed.

Allows the AA to automatically route incoming calls to specific destinations such as a greeting table, mailbox, extension or CCR tree.

This can be programmed by area code, exchanges or individual telephone number.

Note: For the Calling Line ID table to operate, customers must subscribe to telco Call Display services:

- Call Line Identification,
- Automatic Number Identification.

Single Digit Menus (CCR)

Available with Custom Call Routing, a caller can select a menu option by pressing a single digit.

Single digit dialing improves customer service.
Gives customers more detailed information very quickly.

Speech Recognition Auto-Attendant

(See Speech Recognition Option)

Touch tone gate for Auto-Attendant/CCR

This new feature available with Norstar Voice Mail 3.0 allows the system to quickly determine if the caller has DTMF capability and expedite the call if no DTMF is detected.

In areas where rotary phones are common, or where reliable answer supervision is not provided by the public network, the long hold times previously experienced are eliminated.

Decreases hold times and frees up voice channels previously unnecessarily busied out.

Transfer Point to an External Number from CCR

A caller can be transferred to a number outside the Norstar system.

Transfer (via Feature 986) of an external caller to a specific CCR Tree

Callers can be directed to a specific CCR Tree.

Desktop Messaging**Client application support on Windows™ NT**

Desktop Messaging can be run in the Windows™ NT environment. Each PC must also be equipped with a LAN card, an optional sound card, microphone and speakers.

Client application support on Windows 95 or 98

Desktop Messaging can be run in the Windows™ 95 or 98 environment. Each PC must also be equipped with a LAN card, an optional sound card, microphone and speakers.

Compose/edit fax cover pages

Desktop Messaging allows the user to create new or edit existing fax cover pages either textually or verbally.

Compose edit/fax messages

Desktop Messaging allows the user to create new or edit existing fax messages either textually or verbally.

Fax message manipulation

Desktop Messaging allows the user to save, forward, reply to, delete and archive fax messages from their PC desktop.

Fax message voice annotation

Users can add voice annotations to their fax messages.

Fax message waiting indication on client PC

With Desktop Messaging, users will receive notification of new messages while logged onto Exchange.

Prioritize messages by attribute of choice

Desktop Messaging allows users to prioritize and sort messages by: classification, date and time, sender or subject.

Receipt/delivery of messages from MAPI 1.0 servers

The user receive notification of the receipt and delivery of messages from MAPI 1.0 servers.

Receipt/delivery of voice, fax and simple text via NAM

Desktop Messaging users receive notification of the receipt/delivery of the messages received via the NAM.

Toolbar for frequently repeated functions

Desktop Messaging provides the user with a toolbar containing frequently repeated functions.

View fax from client PC

Users can view faxes from their PC desktop.

Voice message manipulation (save, forward etc.) on client PC

Desktop Messaging allows the user to save, forward, reply to, delete and archive voice messages using their PC.

Voice message playback on client PC

The user can play their voice messages using their PC.

Voice message recording on client PC

The user can record voice messages using their PC desktop.

Voice message waiting indication on client PC

Users notified when a voice message is waiting.

Digital Networking

Delivery options

Network messages can be highlighted as Certified, Urgent or Private.

Direct addressing

Direct addressing allows a user to send a message to any mailbox in the network by entering the parameters required by Norstar Voice Mail.

Forward Network Messages

The body of a network message can be forwarded to other local users.

Network delivery mailbox addressing

The Network Delivery Mailbox stores the parameters required by Norstar Voice Mail to reach the destination mailbox.

Makes it faster and easier for the user.

Non Delivery Notification (NDN)

When an error preventing delivery occurs, a network NDN is generated by the intended recipient system.

Reply to Network Messages

The person receiving a network message can reply and create an outgoing message that is already addressed to the originator.

Site-based addressing

The local subscriber can send voice messages to other company locations using the site address, which is usually the same as, or similar to, the telephone number of the addressee.

Maximizes the use of the mailboxes on the system, compared to the network delivery mailbox method, which requires a mailbox for every person at the remote site.

VPIM (Voice Profile for Internet Mail) compatible

An emerging messaging standard that allows voice and fax messaging among unlike vendor's messaging systems over the Internet.

As of November 1998, Nortel Norstar Voice Mail, Nortel Meridian Voice Mail, Centigram and AVT are VPIM compliant.

Fax programming option

Fax Answering

Fax answering allows a caller to use the auto-send feature on a fax machine to send faxes to Norstar Voice Mail systems.

Fax Broadcasting

Fax Broadcast allows a fax to be sent to multiple destinations, internal and external, with one phone call.

Fax Load via Desktop Messaging

The administrator can load a fax stored in desktop messaging.

Fax Load via Diskette

The administrator can load a fax stored on a disk using the system floppy disk drive.

Fax Messaging

Incoming messages are stored electronically as "fax messages" in a user's voice mailbox.

Fax-On-Demand

Documents can be stored in two ways: by loading fax from a disk or from a fax machine.

Fax Overflow

If the destination fax machine is busy, the document is stored in a fax overflow mailbox on the Norstar Voice Mail system.

Simplified fax printing at off-site locations

After the method of Fax printing has been chosen, a fax telephone number can be entered in the same manner as a fax extension number.

Group List programming

Group Distribution Lists

Created by the system coordinator, these lists allow the same message to be delivered to a group of users by entering only one address destination or distribution list number.

Time is saved in message preparation, production and especially delivery.

Mailbox programming

Assigning Target Attendants

Each mailbox owner can assign an extension as their dial-0 set.

Customer service improves, because transferred calls are answered by individuals more familiar with the mailbox owner's schedule.

Auto Answer with Personal Greeting

After a preset number of rings, answers calls with the personal greeting of the mailbox owner requesting the caller to leave a message.

Callers are given detailed information about the mailbox owner's whereabouts and provided with options (for example, leave a message or transfer to a receptionist).

Automatic Reply To Internal Messages

A mailbox owner can automatically reply to a message with one key stroke.

This saves time because there is no need to look up extension numbers.

Broadcast Messages

A message can be recorded by a system coordinator and sent to every mailbox; it is played automatically, then erased as soon as the subscriber ends the session.

This feature improves internal communications by providing system wide messaging capabilities. Every mailbox owner receives the same message.

Called party cancellation of Off-site notification

The party receiving a remote notification call can turn off notification to this destination. This is useful when a subscriber enters an incorrect destination telephone number. When the called party cancels notification the system removes the number from the subscriber message notification destination list and a NDN containing the incorrect telephone number is deposited in the subscriber's mailbox.

Ensures that if messages are delivered to the wrong person, the subscriber receives notification that the message was not delivered.

Cascading Off-Premise Message Notification

You can program five internal or external numbers that will notify a mailbox subscriber when a message is received in the mailbox. Each number is called in sequence if the number before does not answer. Numbers can be designated as a phone, pager or intercom. Depending on the Class of Service programming, each number can be called up to 9 times at intervals of 5, 10, 15 or 30 minutes per attempt. If a pager is notified, the user must phone in to receive the message. If a phone is notified, the user can access their mailbox once they enter their password. Messages are immediately sent to users wherever they are located, therefore improving both external and internal communications.

Provides better customer service and quicker response time.

Enable or Disable General Delivery Mailbox

Can be disabled or enabled in System Administrator's Mailbox.

Envelope Information

By pressing "7" during or after a message, the receipt time and date of the message is given; for internal calls, the sender's name is also given.

Know exactly when messages were left.

Express Internal Messaging

Internal messages can be sent without opening a person's mailbox; the sender's name and extension are automatically included.

Improves communication.

Forward Copy with or without Comment

Mailbox messages can be forwarded to other mailboxes without rerecording the message.

This lets more comments be attached to the original message.

General Delivery Mailboxes

This multi-purpose mailbox can be used to collect messages after hours, from rotary dial telephones, or for people who don't have a mailbox. The default status for the General Delivery Mailbox is enabled. The General Delivery Mailbox can be disabled or enabled as required by the company.

When enabled, callers who reach the General Delivery Mailbox can leave a message. When disabled, callers will hear the Automated Attendant voice prompt. At any time, callers can press zero (0) to reach the operator. Note: If the operator is not available, the Automated Attendant voice prompts plays.

Guest mailbox

This mailbox is useful for people who do not have a Norstar extension number, yet need voice mail access.

This helps improve communications internally.

General Delivery Mailbox

This is a "last stop" mailbox for unsuccessful call transfers returned to the operator who is, at that time, also unavailable.

Informational mailbox

A business can play frequently-requested information only, with no message-taking capabilities.

Eliminates repeating the same information to multiple callers, such as hours of business or the time of a performance.

Message Delivery Options: Normal, Certified, Private, Urgent

These four options increase the user's control over message delivery:

- Normal: the message is delivered automatically (default);
- Certified: the sender receives confirmation when the message is read;
- Private: messages cannot be forwarded to another mailbox;
- Urgent: a message can be queued to play after broadcast messages, but before "normal" messages.

Message Waiting Notification

When new messages are received, "message for you" appears on the user's display; when the mailbox is opened, the number of new and saved messages is heard.

Improves communications, as it eliminates the need to log on to check for new messages.

Name Confirmation when Sending

The name and number of the person or mailbox being contacted appears in the LCD display.

This eliminates delivery errors.

Name Directory or Extension Accessibility

Any system mailbox extension can be found by

spelling the user's last name on the dial pad.

This increases a receptionist's productivity; faster processing of calls and improved customer service if the caller only knows the name of the person they are calling and not the extension number.

Never Full Mailboxes

External callers will not be prevented from leaving a voice message in a personal mailbox, even if the mailbox is full. The only time an external caller cannot leave a message in a mailbox is when the system is full. To control misuse of the disk storage space, users with full mailboxes will not be able to retrieve new messages, or create, send, copy or reply to messages until at least one saved message has been deleted. In cases where all the messages in the mailbox are new, the user will be able to listen to at least one before they are prompted that some messages must be erased to retrieve new messages.

Allows for maximum storage capacity of the system and improves customer access to voice mail users.

Outbound Transfer from Mailbox

A caller, while listening to a personal greeting in a mailbox, can press "7" to be transferred to an external number specified by the mailbox owner. The mailbox owner may choose to include this instruction as part of their greeting or keep it as a private arrangement for certain callers. When this feature is included in the mailbox class of service, the mailbox owner can turn this feature on and off.

Improves customer service by providing a means for urgent contact when necessary.

Playback Controls

Subscribers can move within or between messages, without listening to each message entirely.

People have increased control while listening to their messages.

Personal mailbox

A mailbox can be assigned to a particular person and extension number for their exclusive use.

Owner can receive detailed, confidential messages 24 hours a day.

Prerecorded Greetings Storage

Up to 40 prerecorded greetings can be stored on Norstar Voice Mail, 20 on Flash Voice Mail.

Time is saved because a system coordinator does not have to re-record new messages each day; messages remain consistent, thereby giving businesses a more professional image.

Primary and Alternate Greetings

A mailbox subscriber can switch between prerecorded primary and alternate greetings.

This allows for greater flexibility.

Recovering Deleted Messages

During a mailbox session, a user can revisit a previously deleted message and save the message.

Allows user to move quickly through mailbox messages without the risk of accidentally deleting a message that they wish to retain.

Remote Call Forwarding to Voice Mail

The mailbox owner will be able to turn Call Forwarding to Voice Mail on or off from a remote location.

If the user has forgotten to Call Forward or is unexpectedly away from the office, they can still forward to voice mail so that their customers do not have to wait through multiple rings.

Saved Message Queue and Retention Periods

Messages are saved for a preset time period as determined by Class of Service; saved messages are stored in a queue and played after any new messages.

Important messages can be saved, in case some detail is forgotten.

System Coordinator Mailbox

This is used by a system coordinator for administration and to send broadcast messages.

These special mailboxes ensure no calls are lost, while at the same time improve system management.

Trouble Mailbox

This can be used to report system problems or user troubles.

Urgent Message Notification

The prompt “This message is urgent” will precede playback and display an urgent message. Urgent messages will be moved to the front of the new message queue, ahead of non-urgent messages. When urgent messages are saved, the urgent indication is ignored and the message is queued in chronological order.

Improves the user’s time management by dealing with most important issues first.

Miscellaneous

Call Screening per set

After an external caller enters the extension of the person they wish to speak to, the Automated Attendant asks the caller to record their name. The Automated Attendant then transfers the call to the extension, announces the name of the caller and offers the called party the option of accepting the call or letting the caller leave a Voice Mail message.

Call screening is particularly useful where Calling Line Identification (CLID) information is not available, or when the called party has a set without display capabilities. This feature is enabled on an individual mailbox basis from mailbox administration. Call Screening only applies to external calls dialed by callers using the extension dialing capabilities of Auto Attendant or Custom Call Routing.

Improves productivity by allowing the user to choose whether to interrupt work to take a call.

Dynamic Voice Channel Allocation

Voice channels are not dedicated to an

Automated Attendant or voice messaging.

Fast, efficient call processing results.

Enable or Disable the Company Directory

The system coordinator can enable or disable access to the company directory for internal and external users.

Enable or Disable Voice Mail Feature

The system manager can globally enable/disable the Voice Mail feature. If Voice Mail is disabled, the calling party will not be answered by the subscriber’s mailbox. Instead, the caller will be directed back to the Automated Attendant or CCR application for more options. When disabled, only Feature 980 and Feature 986 will be allowed to leave messages.

External Volume Control

Users listening to messages from outside the company can increase the playback volume by pressing *.

This feature eliminates message distortion, and ensures users will hear details correctly.

Interrupt Feature Feature 9 8 7

Allows mailbox user to retrieve calls that have been forwarded to voice mail. Call can be interrupted at any point during the mailbox session.

Provides opportunity to retrieve calls if in the office.

Multiple recipients per message

Messages can be sent to multiple recipients with one set of delivery options applied to all recipients. In releases prior to Voice Mail 3.0, each recipient of a multiple addressee message received a unique message with its own delivery options. When addressing the message, the subscriber can choose to add recipients or delivery options in any order prior to sending the message.

Saves time when sending messages to multiple recipients.

Record a Call Feature 9 8 9

When activated by Feature Code 989 from the Norstar user's set, allows the user to have the mailbox act like a tape recorder and record the telephone conversation. The system prompts both parties "This call is being recorded". Once the conversation is recorded, it has the same appearance to Norstar Voice Mail as a voice message - so the user can forward it, delete it, or in conjunction with Desktop Messaging, can "archive" the call ("message") as a wave file to a PC hard drive, floppy disc, or zip drive.

Because of the sensitivity to local laws in different regions of North America, the feature is disabled for all Classes of Service and must be specifically enabled by the system administrator.

Allows users who have the need to document, via recording, various conversations, such as real estate offices where customers and agents are exchanging and making buying and selling commitments, long lists of statistical or accounting information, homework assignments, athletic team practice schedules, or ordering information in a customer service environment.

Semi-interruptible greetings (Extended Absence greetings)

A mailbox owner can let callers know about an extended absence. When the Extended Absence greeting is in use, callers who attempt to bypass it will be prompted that this is a special greeting and the system will give them the option to play the greeting again. A special tone precedes the greeting and alerts callers that it is in effect.

Receiving up to date information about absences contributes to customer satisfaction.

Single Button Call Forward to Voice Mail

Feature 9 8 4

With Norstar Voice Mail 4.0, the user can activate Feature 984 to forward all calls to voice mail automatically. Prior releases required the user to program both the voice mail DN and Feature 4 to

forward their extension to the voice mail DN.

Programming of a single button allows users the opportunity for uninterrupted time to focus on projects that have critical deadlines or to dedicate time to a high priority assignment.

Single Trunk External Link Transfer

The ability to transfer out of voice mail, externally, without tying up two trunks for the duration of the call.

For businesses that use centralized answering for multiple locations, calls can be routed to the appropriate location for products and services, without tying up two trunks to complete the transaction. The business benefits by getting better trunk utilization on their system and being able to take and process more transactions.

Speech Recognition Voice Activated Dialing

(See Speech Recognition Option)

Timed delivery of messages

A subscriber can create a message and delay delivery of that message until after a specified date and time. The message can be delayed up to the number of days specified in the message retention class of service parameter for a given mailbox. If the Voice Mail system is using the AMIS protocol for networking messages, Timed Delivery messages will follow the standard AMIS rules with respect to call blocking (only urgent message will be sent during call blocking periods).

Subscribers have more flexibility in recording and sending messages.

Trunk Answer On/Off

This feature permits system coordinators to turn on or off incoming trunk lines programmed for answering by the Auto Attendant.

Voice mail system control is enhanced.

Voice Mail Option

The Voice Mail Option may be enabled or disabled at any time. The default status for the

Voice Mail Option is enabled. When enabled, callers can access all mailboxes. Callers who try to reach an extension that is busy, or does not answer, will be transferred to that extension's mailbox. When the Voice Mail Option is disabled, callers cannot leave messages in any mailbox unless manually transferred to a mailbox. Callers can access Information Mailboxes.

When callers hear that the called party is not available, they get transferred to the Automated Attendant voice prompt. At any time, callers can press zero (0) to reach the operator.

Norstar Voice Mail Manager

Client support on Windows NT and Windows 95 and Windows 98

Norstar Voice Mail Manager assumes that Windows 95/98 client PCs have TCP/IP inter-networking capability, which is bundled with Windows 95/Windows 98 and Windows NT operating systems.

Graphical user interface for system admin

Norstar Voice Mail Manager uses the standard Windows interface and uses menus and dialog boxes to exchange information with the administrator.

NVM Mailbox Manager for user administration

Allows users to manage their mailbox functions from their multimedia desktop PC. NVM Manager can be used in conjunction with Desktop Messaging or as a stand-alone tool.

Provides an easy to use graphical interface that gives PC users an alternative to telephone keypad mailbox administration.

NVM Manager administration via network connect

The connection between Norstar Voice Mail and the NAM can be accomplished across a TCP/IP network. In this case, the NAM and the PC must be connected to the network with a NIC.

NVM Manager administration via PPP connect

The connection between Norstar and Voice Mail can be accomplished locally via a null modem cable connection over a point-to-point protocol (PPP) connection. It can be connected remotely via dial-up also using PPP.

NVM Operator Manager for auto attendant administration

Allows a system administrator to administer and change the voice mail system from the desktop. The Operator Manager can also be used to manage other mailbox types, including General Delivery, Information and Fax on Demand mailboxes. Can also change the "business status" and record or change the company directory using NVM Operator Manager.

As a Windows-based application running on the administrator's PC, gives the administrator a fast and easy way to manage the voice mail system.

Reports

Call Handling and Channel Usage Report

This report provides traffic statistics on the types of calls handled, and the traffic against each port used by Norstar.

CCR usage Report

This report has been enhanced to provide the greeting table from which the CCR tree is currently referenced and a seven-day rolling count of the number of calls received by the tree and the number of times each path is visited.

Fax-On-Demand Usage Report

This report lists all Fax-On-Demand requests and shows the date and time, item requested, delivery fax number and caller CLID.

Numeric Mailbox Information Report

This report was previously known as the Numeric Subscriber Report and has been enhanced to include more information about the mailbox.

Helps to identify potential usage problems and reports on all mailbox types, not just subscriber mailboxes.

System Configuration Report

This report shows how the system is configured to include the number of ports, outdial channels, group lists and any options that may be installed on the system, such as Fax or AMIS.

Report Generation

Various reports can be printed at the request of the system coordinator.

Reports help to monitor system programming, and simplify updates and customization.

Security

Centrex Transfer Restrictions (Toll Fraud Protection)

This feature provides toll fraud protection for Centrex installations using the Centrex Transfer feature to transfer calls to other Centrex extensions. If the Centrex Transfer feature is enabled, the extension does not have to be located on the Norstar switch. If the requested extension is not a valid Norstar extension, and the Centrex Transfer feature is enabled, Norstar Voice Mail will instruct the Norstar to perform a “hook-flash transfer” of the caller to the given extension number. This feature is valuable when the Norstar is used in a Centrex installation, but presents a possible security problem, in that a malicious caller or user could be “transferred” to an extension such as 9011, which has the effect of transferring the caller to the international

operator, with resulting charges incurred by the owner of the Centrex line.

The Centrex Transfer Restrictions feature counters this security exposure by specifying a set of dialing sequences that will be denied in all cases when the Norstar Voice Mail requests a Centrex transfer.

Change of Operator Password

To improve security, a password can be changed from default “OPERATOR” (67372867) to any four-to-eight digit sequence.

Personally chosen passwords are easier to remember and more secure.

Double entry of new passwords

In releases prior to Voice Mail 3.0, the user entered a password, listened to it and was then prompted to “accept” it. Mailbox owners must enter a new password twice when changing their password.

Higher password accuracy.

Forced Password Change

As a security measure, mailbox owners will periodically be required to change their passwords. The intervals can be set for either 0, 30, 60, or 90 days (0 is interpreted as never changing the password). If the password has expired, it does not prevent access to the mailbox, but the user is prompted that the password has expired and the password must be changed.

Confidence in the security of a communication device is a necessity in the business place.

Incorrect Password Detection and Lockout

The Norstar Voice Mail system tracks the number of incorrect login attempts since the last successful login. When the number of unsuccessful attempts exceeds a threshold, the mailbox will be “locked out” and cannot be opened, even with the correct password, without administrator intervention. The maximum

number of login attempts is controlled by the class of service.

Provides additional security.

Internal Norstar Set Initialization

If this option is selected on initial Norstar Voice Mail installation, mailboxes can only be initialized from a Norstar set on the same system as the Norstar Voice Mail.

Provides additional security.

Outbound calls restricted to preset line/pool

Allows the Administrator to specify which line or pool is to be used for Norstar Voice Mail outgoing calls.

Helps control or prohibit toll fraud. Contributes to cost reduction.

Set based restrictions for outbound calls

Outgoing calls initiated by Norstar Voice Mail are subject to the set based restrictions, regardless of the line or pool selected as the outgoing facility.

Helps control or prohibit toll fraud. Contributes to cost reduction.

Speech Recognition Option

Speech Recognition Auto Attendant

Provides a call routing service for external callers who do not know the extension. Callers simply speak the name of the party they are calling, or if programmed, a synonym or alias, such as a nickname or the name of the department. Each name in the Company Directory can have one alias.

External callers and customers do not have to take the time to look up an extension number or spend time searching for a business card on their desk. Nor do they have to use the company directory to “look up” the extension number of the party they are calling. Faster call processing and significant reduction on the demands on the attendant.

Speech Recognition Voice Activated

Dialing Feature 9 8 8

Provides an internal user the ability to make an internal call by activating Feature 988 and speaking the names of co-workers that are listed in the Company Directory.

Employees can instantly call co-workers from anywhere in their facility, even when they don't have access to a hardcopy directory.

Norstar Call Centers

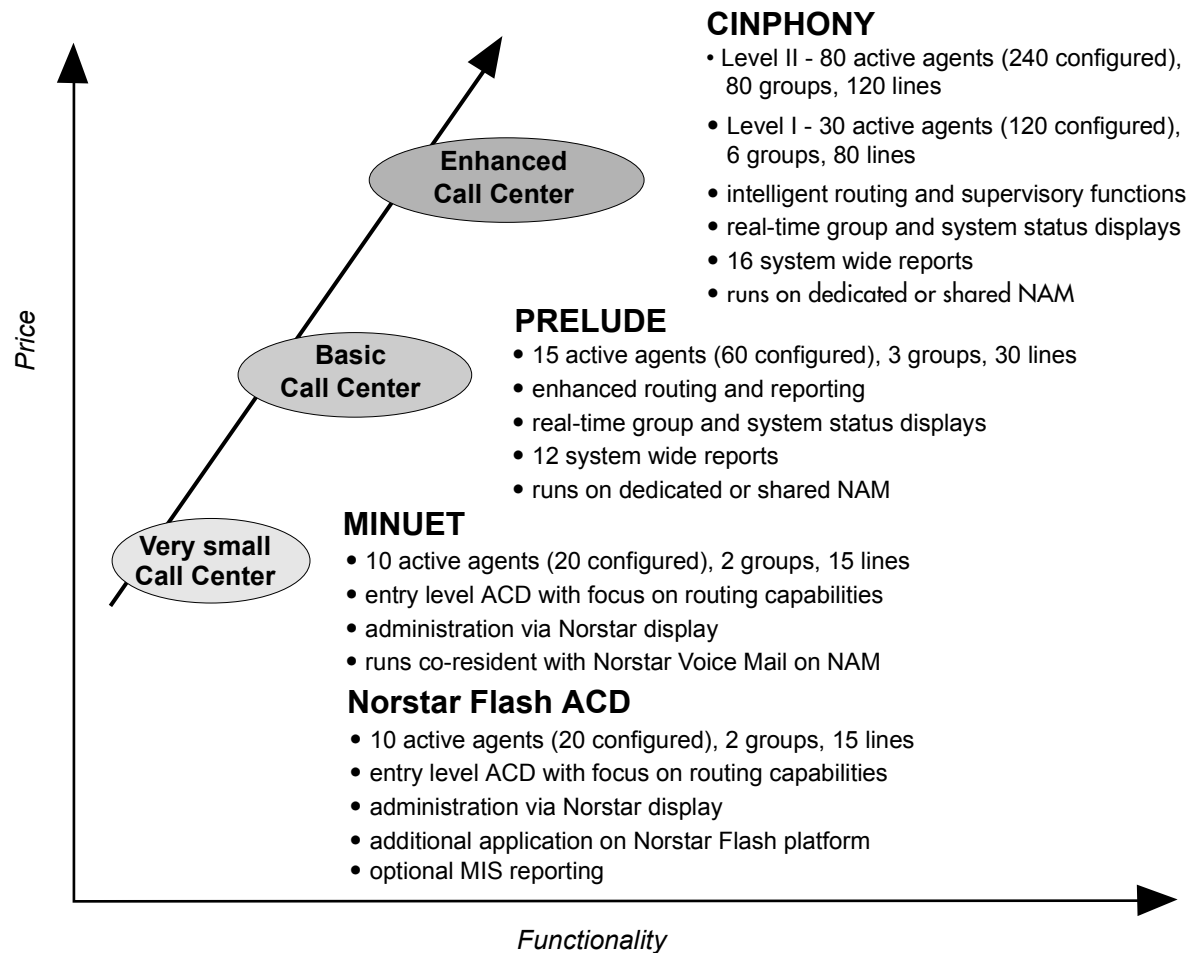
Wherever there are several people answering similar kinds of telephone calls—at an order desk or reservations office, in a customer service department or technical support center—there is an opportunity to implement Automatic Call Distribution (ACD).

Nortel Networks offers a comprehensive call center product portfolio for Norstar systems: Norstar Flash ACD, MINUET, PRELUDE, and CINPHONY. Each provides businesses, branch offices and departments with an effective tool to manage and organize how calls are distributed. When calls are distributed properly, customers can see increased customer satisfaction, staff productivity, and revenue, as well as an improved office environment.

Today's call centers are various combinations of size, scope and complexity. The relative scale of a call center operation must be measured using more than one of these factors. For example, traditionally there were only large, formal call centers. Today, a small order department with 12 agents might serve a national market and require integration to sophisticated applications such as voice mail.

Together, Norstar's four call center applications target call centers of all sizes and provide solutions for both formal and informal call centers. A company with a formal call center will dedicate several people to answering similar kinds of telephone calls. The individuals, or agents within the formal call center specialize in answering incoming calls and concentrate on that activity.

Informal call centers, on the other hand, also have several people answering similar kinds of calls. However, individuals may or may not be dedicated to answering incoming calls. They may be part-time agents and perform other duties within the business or they may be perceived as experts who happen to take phone calls.



Norstar Call Center Values

Your customers will be looking to:

- Increase revenues,
- Reduce costs,
- Increase customer service,
- Optimize staffing resources.

Norstar Flash ACD, MINUET, PRELUDE, and CINPHONY assist companies in managing incoming calls and allow more calls to be processed by the same number of agents.

Research has shown that 34% of callers will enquire about a product or service advertised while on hold. All four Norstar call center applications provide announcements that are used to encourage callers to hold and can be used to advertise products and services while on hold.

In addition, reports and the real-time status display options provided by Norstar Flash ACD, PRELUDE and CINPHONY ACD reporting systems can be used to manage individual and

agent group performance resulting in increased agent productivity. Industry studies show that an increase in agent productivity can range from 20-40%, depending on current call answering practices.

Increase Revenues

Norstar's call center applications can help your customers create new revenue opportunities by expanding their market coverage, upselling their account base, extending their sales hours and educating their customers.

The applications can increase revenues by:

- Increasing the number of calls handled,
- Reducing customer hold time,
- Eliminating ring/no answer,
- Reducing abandoned calls.

By using the routing features of ACD applications to automatically route calls, a business can offer extended hours, while providing expanded customer service and increasing revenues.

With Norstar's call center applications, a business can cost effectively expand geographically, even internationally, and can turn marginal accounts into major customers.

Reduce Costs

All four Norstar call center applications can reduce a business's operating costs, sales costs, complaint costs, and warranty and service costs.

Norstar Flash ACD, MINUET, PRELUDE and CINPHONY can help reduce operating costs by:

- Minimizing/eliminating receptionist call handling,
- Increasing agent satisfaction,
- Reducing agent absenteeism and turnover.

Norstar PRELUDE and CINPHONY can further reduce operating costs by:

- Promoting effective agent training by using the Norstar display to show system information and messages,
- Aiding with decisions about staffing needs,
- Measuring and reporting agent efficiency promptly and accurately,
- Reducing manager time spent on paperwork.

More efficient call allocation can also translate into reduced long distance charges through better management of phone lines.

Norstar's four call center applications can help reduce trunk costs by:

- Delay Answer feature if no attendant is available to take the call,
- Shortening customer hold time on 800/888 lines,

- Reducing the number of returned calls to customers,
- Saving time routing calls,
- Identifying line usage.

Norstar PRELUDE and CINPHONY further reduce trunk costs by:

- Routing calls according to priority,
- Utilizing the advantages of Call Identification routing to direct calls to the proper agent and reduce set-transaction times.

All four call center applications can help reduce sales costs by:

- Improving customer service,
- Building customer loyalty,
- Decreasing customer complaints.

Increase customer service

Norstar Flash ACD, MINUET, PRELUDE and CINPHONY offer increased customer service by:

- Extending customer reach,
- Handling calls more effectively,
- Answering calls immediately,
- Allowing businesses to program queues for specific departments,
- Using the Auto-logout feature to ensure calls will be answered by an available agent and not routed to an unattended agent set.

As well, the Norstar call center product portfolio offers the caller the option of leaving a message in a voice mailbox.

Optimize staffing resources

The call center applications offer features that help businesses optimize their staffing resources.

The Overflow feature expands the agent pool so that more agents are available to answer calls.

The Wrap feature gives agents time to prepare themselves for the next call, which helps lessen stress for staff.

The call routing abilities helps to balance the workload and off-load work from busy employees. Multi-skilled agents can be logged into more than one group at a time, maximizing their skills.

Call center applications enhance the overall work environment and staff moral by reducing noise levels and ensuring an even distribution of calls.

Norstar Flash ACD, PRELUDE and CINPHONY call center applications offer real-time status displays to make immediate changes. Also, historical reports assist in predicting staffing requirements and measuring performance.

Vertical Markets & Potential Applications

	Appointment Centers	Catalog Sales	Claims	Classified Ads	Circulation	Credit Authorization	Customer Service	Dispatch	Help Desk	Information	Order Entry	Registration	Reservations	Shareholder Service	Technical Services
Air Freight							√	√		√	√				
Airlines			√				√	√		√			√		
Cable TV Co.	√						√	√	√	√	√				√
Credit Approval Co.						√				√					
Distribution Co.	√	√	√				√	√			√				√
Banks, Credit Unions						√	√			√				√	
Government Info. Agencies	√	√	√				√	√	√	√			√		√
Hospitals	√						√	√		√		√			√
Hotels/Motels													√		
Insurance Co.	√		√				√		√	√					
Manufacturers		√	√				√		√		√				√
Newspapers				√	√			√			√				
Public Transit								√		√			√		
Public Utilities	√						√	√	√	√	√				√
Railroads			√				√	√		√			√		
Retail		√				√	√	√		√	√				√
Telemarketing Co.		√				√				√	√				
Ticket Offices						√				√	√		√		
Travel Agencies							√		√		√		√		
Universities	√	√								√		√	√		

Norstar Flash ACD overview

Norstar Flash ACD is the latest addition to the Norstar Call Center portfolio. Flash ACD is a software application designed to run either alone or along with voice mail on the Norstar Flash platform. Flash ACD provides basic Automatic Call Distribution (ACD) functionality and focuses on call routing capabilities. Norstar Flash ACD is a complete call center solution that features powerful ACD capability including built-in recorded announcements.

Norstar Flash ACD is an entry level ACD for the very small formal or informal call center. It removes the perceived complexity from ACD and provides small businesses, branch offices and departments with a cost effective tool for managing and organizing how calls are handled within an organization. It provides simple installation, support and maintenance, as well as ease of programming through the intuitive prompting of the LCD on the station set.

Other Norstar Flash ACD features include:

- Up to 10 active agents,
- Up to 20 configured agents,
- Up to 2 ACD agent groups,
- Up to 15 assigned lines,
- Station set-based system administration and queue status displays,
- 10 built-in recorded announcements,
- Longest Idle and Top Down routing,
- Overflow.

Users of Norstar Flash ACD require more enhanced queuing and routing capabilities than hunt groups or Uniform Call Distribution (UCD) can provide. The Flash ACD call center's primary function is to systematically hold calls in a queue and efficiently route them to employees or agents.

A typical Flash ACD customer will:

- Have a very small, formal or informal call center application,
- Have a Flash Voice Mail or 3rd party voice mail system installed or no voice mail system installed at all
- Not have a need to expand the call center beyond 10 agents and/or 2 groups,
- Require basic call center functionality,
- Be price sensitive.

Norstar Flash ACD Management Information System (MIS)

Norstar Flash ACD MIS is an optional reporting package for the small call center market. It is a powerful information management tool that provides real time access to a wealth of information that can be used by call center managers to make the most efficient use of lines and agents.

MIS features include:

- Runs alongside existing software applications on any Windows '95 or '98 capable PC,
- Supports up to 16 supervisor workstations on a single system without affecting the status display screens on each others PC,
- Provides real-time status displays, current reports and historical reports that can be accessed at either a System level or a Queue level,
- Supports multiple Wallboards,
- Provides password protection.

The Norstar Flash ACD hardware and software must be installed and configured before Flash ACD MIS is installed. The Flash ACD MIS software, supplied on a CD-ROM, can be installed alongside existing applications on a client PC (Windows '95 or '98 compatible). When installing Flash ACD MIS, the computer must be connected through a serial port so that the data from the Flash ACD can be collected. A serial cable is supplied with the Flash ACD MIS software in order to connect the Flash ACD module to the computer.

The PC must be running whenever statistical data needs to be collected. It is recommended that the PC, on which Flash ACD MIS is installed, be running at all times.

The software that sends data to Flash ACD MIS is preloaded on the Flash ACD feature card (release 1.95 or greater). When the Flash ACD is initially installed, this data output is not activated. A softkey, supplied with the Flash ACD MIS package, will enable the feature card to send data output to the MIS client PC.

Note: Flash ACD units purchased prior to release 1.95 require the *Flash ACD/Voice Mail Upgrade and MIS Reporting* package.

Real-Time Status Display

While the Norstar Flash ACD is routing calls, it is also storing information in the client PC's database about all activity on the system. Because both call routing and the database are controlled by the system, information can be displayed on the MIS status screens instantaneously.

Once Real-time status display has been selected at the System level on the client PC, four windows open on the screen (only two of which can be seen at one time). The first two windows are in graphical format, displaying colors and numbers to visually illustrate activity. Closing or minimizing the two graphical windows changes the view to windows showing the real-time status in numerical information.

Graphical Example: Real-time System Status display

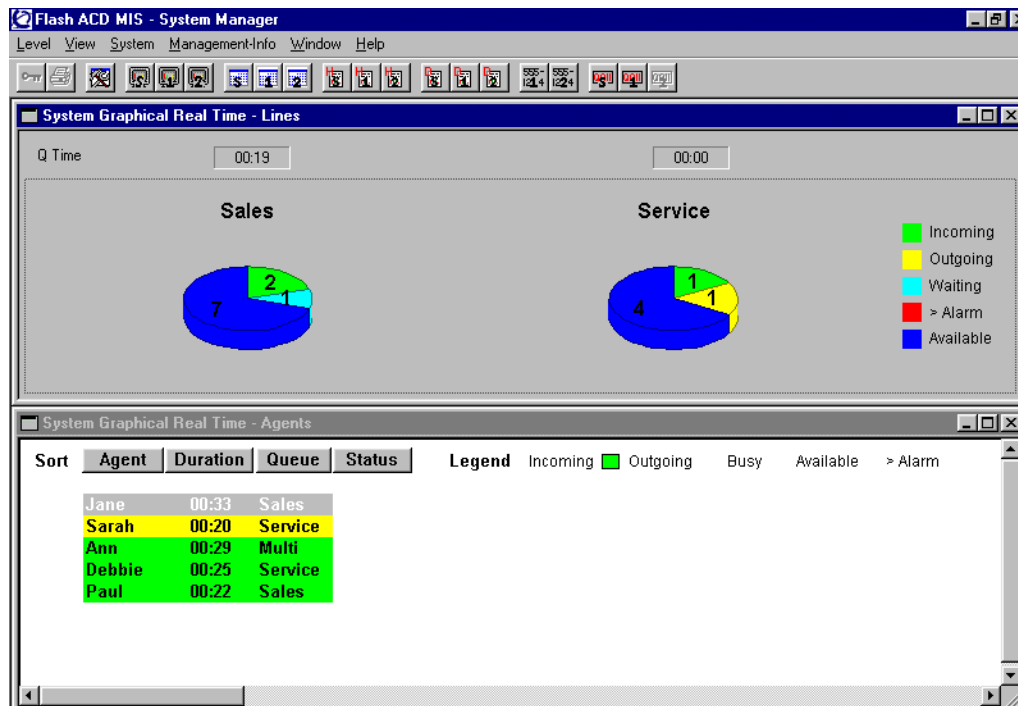
The following screen shows a graphical display of the system lines (in the upper half of the window) and a graphical display of the system agents (in the lower half of the window).

The System Status - Lines window shows the following line activity for each queue:

- Queue time of longest waiting call,
- Number of incoming and outgoing calls,
- Number of calls waiting and greater than threshold,
- Number of lines available for calls.

Information displayed in the System Status - Agents window can be sorted by agent, status duration, queue name, or agent status. The System Status - Agents window shows the following activity:

- Names and status of all agents logged in,
- Status duration of all agents logged in,
- Queue name to which each agent belongs.



Numerical Example: Real-time System Status display

The numerical view of the Real-time System Status display is accessed by closing or minimizing the two graphical view windows shown on the previous page. Like the graphical view, the numerical view has a window for System lines and a window for System agents - and they show, in numerical values, the same information as the graphical windows.

The screenshot shows the 'Flash ACD MIS - System Manager' application window. It contains two sub-windows:

System Numeric Real Time - Lines

Queue	Total	Waiting	> Alarm	Outgoing	Incoming	Oldest Call	Mode
Sales	10	1	0	0	3	00:41	In
Service	6	0	0	1	1	00:00	In

System Numeric Real Time - Agents

Queue	Available	Incoming	Busy	Outgoing	Service Status 00:08	
					Abandoned	Grade of Service
Sales	0	2	1	0	0	100%
Service	0	2	0	1	0	100%

Graphical Example: Real-time Queue Status display

The Real-time Queue Status display shows call center activity for each individual line and agent in the queue.

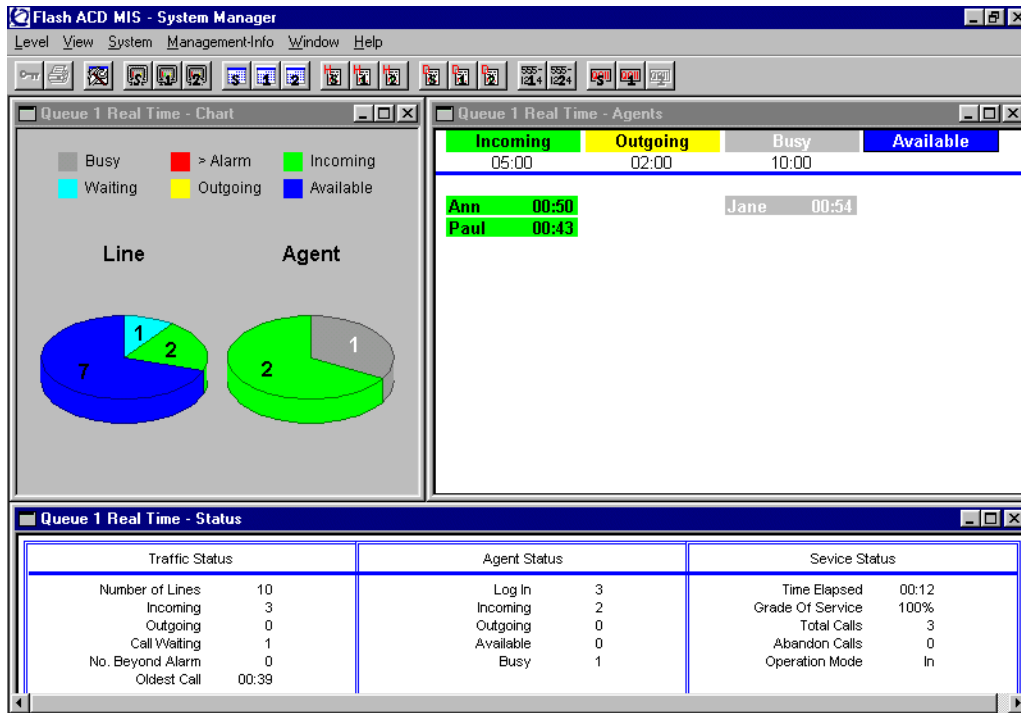
The upper left hand section of the screen is a graphical window showing pie charts for line and agent activity. As lines and agents become busy or are on incoming or outgoing calls, the charts will reflect the percentage of activity.

The upper right hand section of the screen is a graphical window showing the status of each agent logged onto the Group. Activity is shown as follows:

- Agents on outgoing calls are highlighted in yellow,
- Agents on incoming calls are highlighted in green,
- Agents who are busy are highlighted in grey,
- Agents who are free and ready to take incoming calls are highlighted in blue.

The time thresholds, along the top of the columns in the agent status window, are programmed in the Real-time setup windows. When an agent exceeds any of these thresholds the agent's name is highlighted in red.

The bottom section of the screen is a numerical window that presents the same information in a three-column, numeric format.



Current Reports and Historic Reports

Norstar Flash ACD MIS offers two reporting periods: Current and Historic. The reports are accessed through the Management Info menu, which also offers a choice of viewing a System level or Queue level report.

The Queue level will report activity for each individual line and group for the selected Queue, and the System level will report activity for the entire ACD system.

Current Reports provide data for either the current hour or the current day. The following reports are available:

- Waiting Time,
- Abandoned Call,
- Incoming Call,
- Agent Activity,
- Average Time,
- Abandoned CLID Report,
- System Capacity Report,
- Call Profile,
- Agent Profile Report,
- Summary Report,
- Configuration Report.

Historic Reports are available for periods outside the current day. By selecting from a calendar, Historic Reports can viewed by the hour, daily, weekly or monthly. All reports go as far back as needed, and can be stored on diskettes for later retrieval.

Positioning with Norstar Flash Voice Mail

Norstar Flash ACD can be positioned as an add-on application for Norstar Flash Voice Mail. It complements Flash Voice Mail capabilities by adding enhanced Custom Call Routing and call queuing functionality. Norstar Flash ACD is ideal for situations where it is desirable for calls to be answered by a person before having the option to be transferred to Voice Mail.

Flash ACD demonstrates the multiple application capability of the Flash platform. It also provides a competitive advantage for Norstar Flash Voice Mail by cost effectively adding an enhanced software application without the customer having to duplicate an investment in an application platform.

Voice channels on the Flash platform can be shared between the Voice Mail application and the ACD application, if desired. Alternatively, voice channels can be dedicated or assigned to a specific application.

Intelligent integration

Norstar Flash ACD is designed to be integrated with Norstar systems. To ensure easy integration, Norstar Flash ACD:

- Is programmed using the M7310, M7324, or T7316 (two-line display telephones),
- Uses the Norstar displays to assist users in programming. For example, if an agent presses the “Cancel wrap” key before logging in, a message will instruct the agent to log in first. The functions of the soft keys will also change by activity, bringing up functions when it is appropriate to do so and thus “teaching” the agent how to use the system.
- Also uses the Norstar display to show system information and messages such as the group the call is for,
- Allows agents to log in from any Norstar station set,
- Does not require station sets to become dedicated to ACD when an agent logs in. For example, a logged in agent can still make an intercom call. In addition, standard Norstar M7208, M7310 and M7324 telephones are used for agent positions.
- Allows calls to be transferred between Flash Voice Mail and Norstar Flash ACD.

Agent functions can be programmed onto memory keys on Station sets.

Norstar Flash ACD can integrate incoming Call Line ID directly from the Norstar system. If CLID is selected for a line, Flash ACD will not answer the call for 5 seconds (default) or until the CLID is received from Norstar. The CLID information is displayed on the LCD of the agent receiving the call.

Installed base

The introduction of Norstar Flash ACD creates an excellent opportunity for Norstar key system and Norstar Flash Voice Mail system customers to economically upgrade their system to include the Automatic Call Distribution features.

Existing Norstar Flash Voice Mail customers simply require an upgrade package for their unit to implement a call center solution. The Norstar Flash ACD upgrade package includes a new system software cartridge and a software keycode to activate Flash ACD.

A 4-port system is required to support both applications (Voice Mail and Flash ACD). Thus, if a customer has a 2-port Flash system and wants to add a second application, they must also purchase the Flash Expansion Module.

Hardware requirements

Norstar Flash ACD is compatible with all Norstar Flash hardware platforms. Release 1.9 or higher of Flash is required for compatibility with Compact ICS 4.0 and higher or Modular ICS 4.0 and higher.

Agents can use the M7208, M7310, M7324, T7208, or T7316 station sets for their daily activities. System programming is performed on the M7310, M7324, or T7316 sets.

Each station set must have at least 2 intercom buttons. ACD lines ring on intercom buttons because lines are not assigned to the DN.

The use of an Uninterruptable Power Supply (UPS) is strongly recommended to act as a short term generator and to guard against power surges and dips.

The Norstar Flash applications are available in the following packages:

- Stand-alone Flash ACD (2 or 4 voice channels activated),
- Flash Voice Mail and Flash ACD (4 channels activated),
- Stand-alone Flash Voice Mail or Flash Voice Mail Light (2 or 4 channels activated).

Note: For Flash ACD and Voice Mail to run co-resident on a single Flash system, a total of 4 ports is required.

While the other members of the Norstar Call Center family were developed in partnership with Cintech Tele-management Systems Inc., Nortel Networks is the sole developer of Flash ACD.

Norstar MINUET ACD overview

Norstar MINUET ACD is an entry level ACD solution that targets the very small call center market. It provides businesses with an affordable call center solution for improving customer service and building their business through incoming telephone calls while offering many of the key features usually found on much larger systems.

Norstar MINUET ACD provides call routing and call queuing functionality, agent efficiency features and limited call statistics. It provides a high level of installation, support and maintenance simplicity, as well as ease of programming through the intuitive prompting of the LCD on the station set.

By combining Cintech ACD software with the suite of applications on the Norstar Applications Module (including Norstar Voice Mail and Dial-by-Name), Norstar MINUET ACD provides small, entry level call centers with an effective tool to manage and organize how calls are distributed.

Other Norstar MINUET ACD features include:

- Up to 10 active agents,
- Up to 20 configured agents,
- Up to 2 ACD agent groups,
- Up to 15 assigned lines,
- Station set-based system administration,
- Set-based statistics,
- Longest Idle and Top Down routing,
- Overflow ability.

Users of Norstar MINUET ACD require more enhanced queuing and routing capabilities than hunt groups can provide but with minimal statistical reporting. The primary function of the MINUET call center is to systematically hold calls in a queue and efficiently route them to employees or agents. Agent supervision and Call Center Management are not priorities for the Norstar MINUET ACD user.

Many call centers with less than 10 agents will require the more advanced functions of PRELUDE and CINPHONY. In this situation, Norstar MINUET ACD may be used to introduce the call center discussion but the customer requirements may point to the PRELUDE or CINPHONY upsell opportunity. Norstar MINUET ACD cannot be upgraded to PRELUDE or CINPHONY, however the user interface is common to all three applications to minimize agent training requirements when moving to PRELUDE or CINPHONY.

Positioning with Norstar Voice Mail

Norstar MINUET ACD is bundled with Norstar Voice Mail systems (Release 4.0 and Release 3.0 post July 1998). Norstar MINUET ACD complements Voice Mail capabilities by adding enhanced Custom Call Routing and call queuing. Norstar MINUET ACD is ideal for situations where it is desirable for calls to be answered by a person before having the option to be transferred to Voice Mail.

MINUET ACD further demonstrates the multiple application capability of the Norstar Applications Module. It also provides a competitive advantage for Norstar Voice Mail by cost effectively adding an enhanced software application without the customer having to duplicate an investment in an application platform.

The voice capability is provided by either a Digital Voice Card or a Media Services Base Interface Card (for more information, see Chapter 7 of the Norstar Handbook). These voice ports can be configured by the user as either shared or dedicated. A shared voice channel can be used by either the Voice Mail application or Norstar MINUET ACD as needed. A dedicated voice channel indicates that it can be used only by the specific application to which it is assigned.

Intelligent integration

Norstar MINUET ACD is designed to be integrated with Norstar systems. To ensure easy integration, Norstar MINUET ACD:

- Is programmed using the M7310, M7324, or T7316 (two-line display telephones).
- uses the Norstar displays to assist users in programming. For example, if an agent presses the “Unavailable” key before logging in, a message will instruct the agent to log in first. The functions of the soft keys will also change by activity, bringing up functions when it is appropriate to do so and thus “teaching” the agent how to use the system.
- Also uses the Norstar display to show system information and messages such as the group the call is for and the amount of time the person has been waiting.
- Uses the indicator keys on Norstar sets to communicate information. For example, when calls are in queue, an indicator next to the “Login” key on the agent’s set will flash. As the number of calls in queue increases, the indicator flashes to highlight urgency.
- Allows agents to log in from any Norstar station set.
- Does not require station sets to become dedicated to ACD when an agent logs in. For example, a logged-in agent can still make an intercom call. In addition, standard Norstar M7208, M7310, M7324, T7208 and T7316 telephones are used for agent positions.
- With Minuet Version 1.2 (released September 2000) Companion C3050 and C3060 portable handsets can be used for agent positions.
- Can share physical voice ports with other applications such as voice mail to play announcements to callers.
- Allows calls to be transferred between Norstar Voice Mail and Norstar MINUET ACD.
- Provides statistics that can be viewed when using the M7310, M7324, or T7316. The following statistics will be displayed:
 - Number of calls answered,
 - Number of calls abandoned,
 - Number of calls disconnected,
 - Average time to answer,

- Average time to abandon,
- Number of calls per category code.

Agent functions can be programmed onto memory keys on station sets. When a call is sent to an agent set, the LCD shows the Group Name and length of time the call has been in the queue.

Norstar MINUET ACD can integrate incoming Call Line ID (CLID) directly from the Norstar system. If CLID is selected for a line, Norstar MINUET ACD will not answer the call for 5 seconds (default) or until the CLID is received from Norstar. The CLID information is displayed on the LCD of the agent receiving the call.

Installed base

Norstar MINUET ACD is also available as an add-on application that allows Norstar key system and Norstar Voice Mail system customers to economically upgrade their system to include Automatic Call Distribution features.

Existing Norstar Voice Mail customers simply require the Norstar MINUET ACD software package and 16MB of RAM on their Norstar Applications Module to implement a call center solution. The Norstar MINUET ACD 1.2 package includes a Norstar Voice Mail 4.0 upgrade key code.

Norstar MINUET ACD offers Norstar key system users requiring call center functionality, the opportunity to bring Norstar Voice Mail and MINUET into their installed system.

Hardware requirements

Norstar MINUET ACD is compatible with the Norstar Applications Module (NAM) I and II with either Digital Voice Cards or Media Services Base Interface Cards installed. **16 MB of RAM is required.**

Norstar MINUET ACD 1.2 runs with Norstar Voice Mail release 4.0 on the NAM. Norstar MINUET ACD 1.2 is required for compatibility with Norstar Voice Mail 4.0, Compact ICS 4.0 and higher, and Modular ICS 4.0 and higher.

Agents can use the M7208, M7310, M7324, T7208, T7316, C3050, C3060 or analog station sets for their daily activities. System programming is performed on the M7310, M7324, or T7316 sets.

A dedicated Backup Station set is required. In the unlikely event that ACD becomes unavailable, the Backup Station set handles incoming ACD calls. An M7324 is recommended, but for systems with less than 8 lines, an M7310 or T7316 can be used.

Each station set must have at least 2 intercom buttons. ACD lines ring on intercom buttons because lines are not assigned to the DN.

The use of an Uninterruptable Power Supply (UPS) is strongly recommended to act as a short term generator and to guard against power surges and dips.

The Norstar MINUET ACD package includes:

- Norstar MINUET ACD software with 4 active voice channels (software),
- MINUET ACD Administration Guide,

- 1 set-up kit (includes 10 key cap inserts and quick reference cards and 2 administrative key cap inserts and quick reference cards),
- Software Warranty Agreement.

Norstar PRELUDE and CINPHONY ACD

ACD 3.4

PRELUDE and CINPHONY Version 3.4 deliver new features and functionality enhancements that strengthen PRELUDE and CINPHONY's overall market position. The primary content for this release includes Companion support. Additional enhancements have also been included.

New Features and Functionality

- Companion Support, which allows for compatibility with Nortel Networks' Companion wireless C3050 and C3060 phone sets.
- Increased number of items in scheduler from 50 to 100, and increased number of report/file maintenance items from 150 to 200 in both PRELUDE and CINPHONY.
- Increased number of ANI/ICLID Origination Numbers from 400 to 1000 in both PRELUDE and CINPHONY.
- Increased number of DNIS/DID Destination Numbers from 400 to 1000 in CINPHONY only. PRELUDE limits remain the same as in previous versions.

Release history notes

ACD 2.0

Norstar ACD 2.00.22 and 2.00.25 releases and above are Year 2000 compatible and support ISDN-PRI and ISDN-BRI trunks for added speed and efficiency.

ACD 3.1

Norstar PRELUDE and CINPHONY 3.1 are compatible with Modular ICS 4.1 and Compact ICS 4.1.

Note: Modular and Compact ICS 4.1 cannot run versions of PRELUDE and CINPHONY prior to 3.1; Modular ICS 2.0 cannot run versions prior to 2.00.18 and 2.00.19.

ACD 3.2

Norstar PRELUDE and CINPHONY ACD 3.2 included several enhancements:

- Caller Directed Routing (optional add-on),
- 32 Voice Channel support,
- restructured ACD Groups.

Caller Directed Routing provides the ability to route incoming ACD calls based on DTMF digits entered by a caller. This allows a caller to enter an identifiable number such as a customer ID number or product code. This number routes the call to the appropriate ACD group.

Note: ACD version 3.2 is the minimum version of software required prior to installing Caller Directed Routing.

Norstar PRELUDE and CINPHONY ACD 3.2 support up to 32 voice channels. Voice channels are used to play announcements to callers while they are in the queue. The maximum number of voice channels was increased to 32 to support additional ACD Group capacities and Caller Directed Routing. The number of factory enabled voice channels in version 3.2 remains the same. PRELUDE is shipped with 4 voice channels enabled, CINPHONY I with 8, and CINPHONY II with 12 voice channels. Two-Channel Activation is offered as an add-on option to increase the maximum number of voice channels to 32.

Norstar PRELUDE and CINPHONY ACD 3.2 Groups were increased for CINPHONY I from 4 groups to 6, for CINPHONY II from 24 groups to 80, with PRELUDE remaining the same with 3 groups.

ACD 3.3

The ACD 3.3 release of Norstar PRELUDE and CINPHONY ACD was introduced in January 2000. ACD 3.3 includes all of the functionality of previous releases, plus the following:

- Average QTime Announcement - an announcement to the caller informing them of the average time they will have to wait before their call is answered.
- Expected QTime Announcement - an announcement to the caller using a more advanced calculation to inform the caller of how long they will have to continue to wait before their call is answered. Expected QTime incorporates the amount of time the caller has already been waiting (that is, Expected QTime is the Average QTime statistic less the amount of time the caller has already been waiting).
- Import capability for Caller Directed Routing - creating Caller Directed Routing tables becomes easier in version 3.3 with .csv import capability for Caller Directed Routing digits, descriptions, group number, and priority. Entries no longer have to be manually input since users now have the option to import from an existing source.
- Additional Caller Directed Routing tables (3 total) - Caller Directed Routing is now capable of handling bigger applications with the need for increased flexibility. The number of Caller Directed Routing entries has been expanded through the addition of 2 more Caller Directed Routing tables (1,000 entries per table). The additional Caller Directed Routing tables are include with the Caller Directed Routing Add-On.
- PRI capability for PRELUDE - DNIS/DID routing capability is added to PRELUDE to allow it to function in PRI environments.

PRELUDE overview

PRELUDE is designed for the small call center with up to 15 active agents and introduces the Norstar user to ACD features with powerful capabilities. Features include:

- Up to 15 active agents,

- Up to 60 configured agents,
- Up to 3 ACD agent groups,
- Up to 30 assigned lines,
- PC-based configuration and administration,
- Real-time group and system status displays,
- 16 system-wide reports,
- Advanced call routing tables can be customized and easily configured,
- Support for CLID/ANI allows intelligent routing and effective integration with CTI,
- LAN and remote access to reports (view and print), status display information and ACD administration via INFOCUS software,
- Up to 32 voice channels (with PRELUDE 3.2 or later),
- Wallboard support,
- Optional Automated Attendant.

The PRELUDE user has a small to medium-sized call center and the need to effectively analyze the performance of their call center agents via real-time group and system status displays and system-wide reports. Call Center Management, as well as advanced call queuing are important to the PRELUDE customer.

CINPHONY ACD overview

CINPHONY is a feature rich ACD with additional capacity, advanced features and supervisor functions to meet the demands of the growing call center. Typically, the mature small call center profile includes several agents grouped under one or more supervisors and dedicated to the business of handling incoming calls. In addition to the features of PRELUDE, CINPHONY offers call center features such as:

- Two different levels
 - Level I has up to 30 active agents and 6 agent groups,
 - Level II has up to 80 active agents and 80 agent groups.
- Up to 32 voice channels (with CINPHONY 3.2 or later),
- Up to 120 assigned lines,
- Intelligent routing based on DNIS and DID,
- Call Categorization capabilities,
- Priority queuing,
- 17 management reports,
- Extending the hours of the call center by using a PBX or Centrex transfer to send the call to an “open” call center,
- Exporting call records to other software packages for specialized reporting,
- Supervisory capabilities such as Silent Monitor, Agent Help, etc.

CINPHONY users have growing call centers and require advanced functionality in order to effectively and intelligently route incoming calls. They also place a great deal of emphasis on the need to manage their call center via advanced reporting capabilities and require agent supervisory tools to guarantee quality customer service. The advanced functionality of CINPHONY allows the customer to efficiently handle increasing volumes of calls.

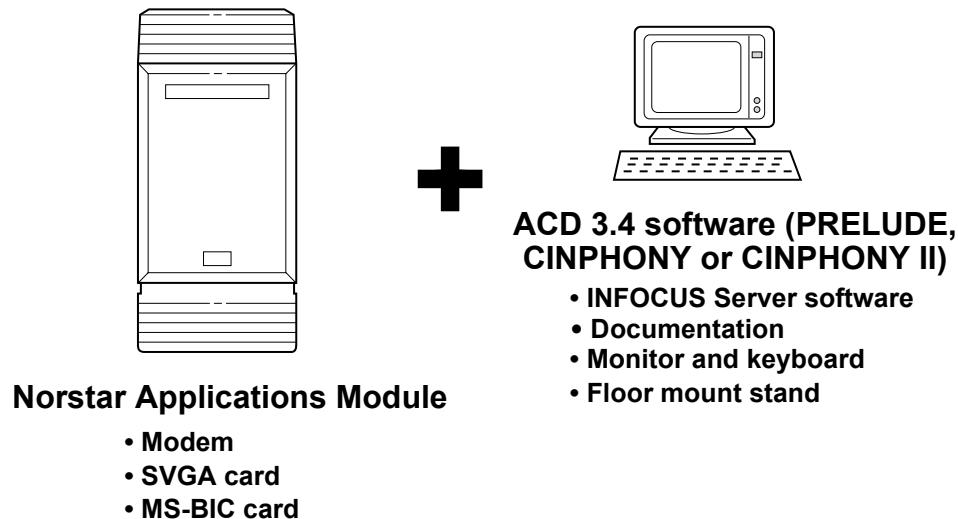
Norstar PRELUDE and CINPHONY ACD Architecture

With release 3.0 and later, PRELUDE and CINPHONY can run co-resident with other Norstar applications on a single NAM. Norstar PRELUDE and CINPHONY (3.0 and later) are available as stand-alone and software-only packages. The stand-alone package is a complete system, so the customer is not required to make any further purchases. A software-only package is available for customers who want to add PRELUDE or CINPHONY to their existing NAM II that may be running Norstar Voice Mail.

Note: PRELUDE and CINPHONY 3.0 are compatible with Norstar Voice Mail 3.0.

PRELUDE and CINPHONY Release 3.1 (minimum) is required if using Norstar Voice Mail 4.0.

Stand-alone package



The stand-alone Norstar PRELUDE and CINPHONY ACD package includes: the PRELUDE or CINPHONY ACD software, INFOCUS Server software, documentation, monitor and keyboard, floor mount stand and the Norstar Applications Module.

The Norstar Applications Module is equipped with all of the required hardware, including a modem, SVGA card and an MS-BIC card.

The MS-BIC card provides eight physical voice channels. The number of physical voice channels can be expanded in increments of 8 up to a maximum of 32 by adding MS-PEC cards. ACD access to these channels is then provided in increments of 2 with software activation key(s).

Voice channels are only in use while the caller is listening to an announcement. They are not in use while on hold, or when the call is presented to the agent or while connected to the agent.

Customers purchase MS-PEC cards based on their individual needs. Fewer voice channels are needed than the average number of callers waiting in queue. For purchasing decisions, a three to one ratio of callers in queue to voice channels is common.

A UPS (Uninterruptable Power Supply) minimizes the risk of losing valuable real-time calling information due to events of nature. It acts as a short term generator in the event of power outages and guards against power surges and dips.

A Backup Set must be designated for the ACD system. The set must be connected in order for the system to function. The Backup Set can be any Norstar set on the system. Calls will be routed to this set in the unlikely event the system goes down.

Software only package (co-residency with Norstar Voice Mail)

In addition to running as a stand-alone application on the Norstar Applications Module, Norstar PRELUDE and CINPHONY ACD (3.0 and above) can run co-resident with Voice Mail. This provides Norstar with a significant competitive advantage as it allows the customer to leverage their hardware investment in the Norstar Applications Module. For example, rather than having to purchase a Norstar Applications Module for each application they can run co-resident, sharing hardware and software resources.

Norstar PRELUDE and CINPHONY ACD (3.0 and above) can reside on Norstar Applications Modules that use DVC or MS-BIC cards. Note that DVC and MS-BIC cards **cannot** be combined on the same Norstar Applications Module. Systems that use DVC cards will continue to do so moving forward.

System requirements for co-residence

- PRELUDE or CINPHONY software (3.0 and above),
- NAM II (preferably but also supported on NAM I subject to traffic requirements),
- 32 MB RAM (total) on NAM,
- Monitor and keyboard (provided by customer or ACD Monitor packages).

Co-resident Voice Channel Utilization – MS-BIC

Norstar's Voice Mail 3.0 and above will only be shipped with Nortel Networks' new MS-BIC 8 channel voice card installed. The customer, when purchasing the voice mail application, pays for the use of a certain number of those installed voice channels—for example, a 2-channel Norstar Voice Mail or a 4-channel Norstar Voice Mail, etc. The remaining physical voice channels on the MS-BIC are unused.

With the introduction of PRELUDE and CINPHONY (3.0 and above) the customer is able to utilize unused physical voice channels that are already in place up to the limit of the ACD's capabilities. In other words, PRELUDE can initially access 4 voice channels, CINPHONY I can access 8 voice channels, and CINPHONY II can access 12 voice channels. The customer can use any channels remaining on the initial 8 channel MS-BIC and/or they can add MS-PECs. Up to 3 MS-PECs, each providing 8 channels, can be added to the initial MS-BIC for a total of 32 voice channels.

The following are three examples illustrating voice channel requirements of co-resident applications:

- Use the remaining available MS-BIC channels of a Voice Mail 3.0 system:
 - ABC Marketing currently uses a 4-channel Norstar Voice Mail 3.0,
 - ABC Marketing wants to add PRELUDE,
 - Norstar Voice Mail uses the first 4 channels and PRELUDE ACD uses the remaining 4 channels. 16 MB memory upgrade is required if NAM is not already at 32 MB.

- Adding additional physical channels:
 - Cloud Nine Marketing currently uses a 6-channel Norstar Voice Mail 3.0,
 - Cloud Nine Marketing wants to add PRELUDE,
 - Cloud Nine Marketing would purchase an 8 channel MS-PEC to expand the number of voice channels, and 16 MB memory upgrade if NAM is not already at 32 MB,
 - Norstar Voice Mail uses the first 6 channels and PRELUDE ACD uses the remaining 2 channels on the initial MS-BIC and 2 channels on the MS-PEC expansion card.

- Additional physical channels and ACD Voice Channel Activation must be added:
 - Rainbow Marketing currently uses a 6-channel Norstar Voice Mail 3.0,
 - Rainbow Marketing wants to add PRELUDE,
 - The very busy call center requires the PRELUDE to support 6 simultaneous voice channels,
 - Rainbow Marketing would purchase an 8 channel MS-PEC to expand the number of voice channels, and 16 MB memory upgrade if NAM is not already at 32 MB,
 - Rainbow Marketing would purchase a 2-Channel Software Activation Key (remember, PRELUDE is configured initially to access 4 channels),
 - Norstar Voice Mail uses the first 6 channels and PRELUDE ACD uses the remaining 2 channels on the initial MS-BIC and 4 channels on the MS-PEC expansion card.

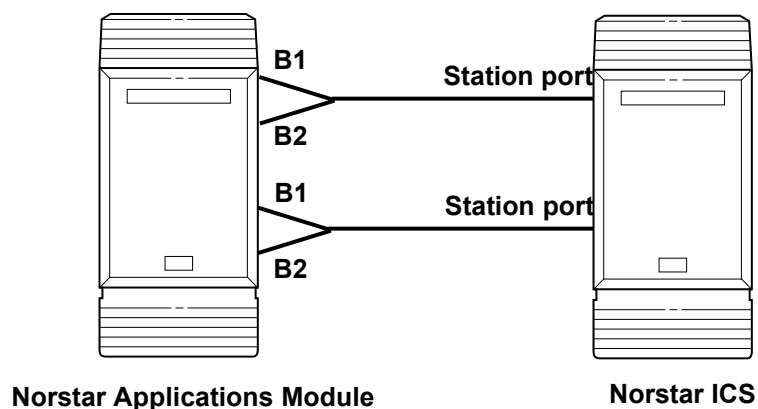
Co-resident Voice Channel Utilization - DVC

The process for adding ACD to an existing Norstar Voice Mail using DVC voice cards is similar except for part numbers and number of channels. DVCs are 4-channel voice cards that can be activated 2 channels at a time. Again, the same method of using the available physical channels to the capacity of the ACD level applies.

In addition, it is strongly recommended that a customer purchase a modem (remote maintenance software is available) and a UPS (Uninterruptable Power Supply). The modem allows dial-in access for ACD software support, dial-in access for assistance with training, and minimizes the need for on-site troubleshooting visits.

Connection to Norstar

Each Norstar ICS station port provides 2 channels (B1 & B2)



Installed Base

PRELUDE and CINPHONY ACD 3.0 and above are supported on NAMs with MS-BIC or DVC cards. Prior versions of PRELUDE and CINPHONY could also be supported on customer provided PCs with Dialogic Voice Cards (D42NS). **ACD 3.0 and above is not supported in a non-NAM environment.** These customers can however migrate to 3.1 by replacing the PC with a NAM and installing the appropriate software package.

Upgrade packages are also available to assist customers in migrating from PRELUDE to CINPHONY and from CINPHONY I to CINPHONY II.

PRELUDE Software

PRELUDE is designed for the small call center with up to 15 active agents (up to 60 agents can be configured) and introduces the Norstar user to ACD features with powerful capabilities. It offers many of the sophisticated call center features found on larger, more expensive ACD systems. These features include:

- 16 different system-wide reports,
- Real-time Group and System Status Displays,
- Digital voice announcements and messages stored on disk,
- Longest idle call distribution,
- LAN/remote access to status displays, reports and ACD admin,
- Call overflow and other advanced call routing,
- Wallboard support,
- Agents can login at any Norstar set,
- Scheduled reports and configuration changes.

CINPHONY Software

CINPHONY I expands on PRELUDE and is a feature-rich ACD with additional capacity and supervisor functions to meet the demands of the growing call center. It is designed for call centers with up to 30 active agents (up to 120 agents can be configured). CINPHONY II adds additional capacity to CINPHONY I systems, targeting small to medium-sized call center locations with up to 80 active agents (up to 240 agents can be configured).

Building on the features offered by PRELUDE, CINPHONY I and II both offer additional call center features such as:

- 17 different system-wide reports (including DNIS and DID reports),
- Allowing agents to handle calls in several groups,
- Intelligent routing based on CLID, ANI, DNIS and DID information, call directed routing,
- Call Categorization capabilities,
- Priority Queuing and routing based on the skill level of agents,
- The ability to extend the hours of the call center by using a trunk to trunk or Centrex transfer to send calls to an “open” call center,
- Exporting call records to other popular software packages for specialized reporting,
- Emergency routing.

In addition, CINPHONY provides supervisory tools to control the call center environment including the following features:

- Display messages on a Norstar telephone display (messages such as the number of calls in queue or a request for “HELP” from an agent),
- Record a call to help ensure call center quality and to assist in training agents,
- Support of wallboards,
- Silent monitor and “JOIN” capabilities,
- Create and change announcements easily,
- An alert to make a supervisor aware whenever too many agents are logged out at the same time.

Stand-alone Models Available

PRELUDE and CINPHONY ACD Suites include value added features that offer significant benefits to customers.

Model	Voice Channels	MS-BIC Cards	Norstar* TCM Ports	Hard Drive Size	Memory RAM
Norstar PRELUDE Suite 4	4	1	2	528 MB	8 MB
Norstar CINPHONY I Suite 8	8	1	4	528 MB	8 MB
Norstar CINPHONY II Suite 8	8**	1	6	528 MB	16 MB

*All ACD models come with an internal 14.4 modem installed. The modem can be connected to the Norstar system via an ATA (Analog Terminal Adapter) or directly to an external line. An additional Norstar station port will be required per model when connecting via an ATA.

**CINPHONY II software provides the ability to support 12 channels of ACD. The stand-alone package includes an MS-BIC card that provides 8 physical channels. To use the additional 4 software channels, an MS-PEC card must be added to the system.

INFOCUS Software

Overview

PRELUDE and CINPHONY ACD 3.0 introduced “INFOCUS”, a new software component for customer provided PCs connected to the Norstar Applications Module. INFOCUS provides access to ACD Status Displays, Report View and Print function and ACD Administration from the Local Area Network or a remote PC. This enhances the accessibility of information for Call Center Supervisors, ACD Agents, Executives, and Knowledge Workers throughout the organization.

Components

The INFOCUS software has two components, the INFOCUS Server software, which provides the main connection back to the Norstar Applications Module running the ACD 3.0 software, and the optional INFOCUS Client software.

- INFOCUS Server software

Each PRELUDE and CINPHONY ACD 3.0 and above package includes one INFOCUS Server software connection, which provides access to Status Displays, Report View and Print functions, and ACD Administration. The software is loaded onto a customer provided PC and is connected to the Norstar Applications Module via the customer’s LAN or direct NAM-to-PC connection. INFOCUS Server software requires Win 95/NT operating system.

- INFOCUS Client software

INFOCUS Client connections are available as optional add-ons, and provide PCs on the LAN with access to Status Display and Report View and Print functions. Each client can be set up so that they only have access to real time reports. In addition, an option to install password protected access to the ACD administration component is also provided. (Note:

only one person may access administration at a time.) The connection from the INFOCUS Client to the INFOCUS Server is via LAN, and all PCs are customer-provided. INFOCUS Client software requires Win 95/NT operating system.

INFOCUS Features

- **Status Display**
Provides color-coded call center statistics in both tabular and graphic format. The essential look-and-feel is the same as the current RS232-based Status Display for Windows 95/NT. The status display information is accessed using a standard browser interface (for example, Internet Explorer).
- **Report View and Print**
Using the same standard browser interface, the customer can view and print ACD reports that have already been generated. Reports are also viewed using a standard browser interface (for example, Internet Explorer).
- **ACD Administration**
ACD Administration provides access to the ACD configuration screens on the Norstar Applications Module. From a PC, a Supervisor has the capability to operate the ACD as though they were sitting at the main ACD terminal and can perform all ACD administration functions. The ACD Administration screens with INFOCUS have the same interface as the main terminal and are the same as PRELUDE and CINPHONY release 2.0.
- **E-mail Distribution of ACD Reports (Version 1.30)**
With INFOCUS v.1.30, it is now possible to generate, schedule, and send ACD reports to each configured user's e-mail address. This functionality allows for more efficient management of the call center. It assures that those individuals who need to see specific information about the operation of the business will now be able to review that information in a consistent and timely manner.

Connectivity

The INFOCUS Server PC can be physically connected to the Norstar Applications Module in two ways:

Direct NAM-to-PC Connection

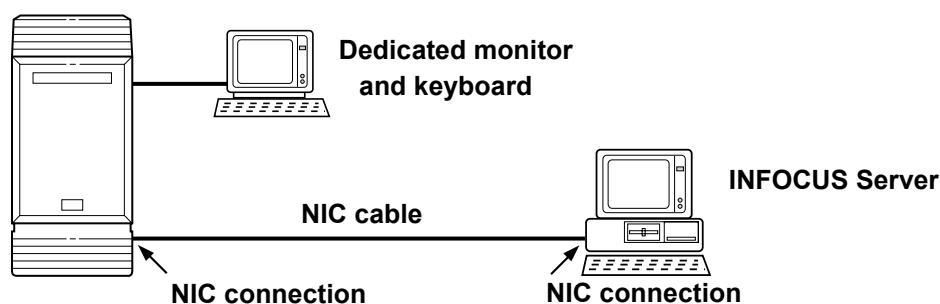
The INFOCUS Server PC can be connected directly to the Norstar Applications Module using Network Interface Cards (NIC). A direct Point-to-Point connection is provided from a NIC installed on the Norstar Applications Module directly to a NIC on the customer provided PC. The INFOCUS Server software then uses this connection to interface with the PRELUDE and CINPHONY 3.0 and above software running on the Applications Module.

ComPort Connection

Prior to INFOCUS v.1.30, it was not possible to connect the INFOCUS Server PC to the Norstar Applications Module (NAM) via a Serial (COM) Port connection. INFOCUS could only be connected to the NAM via a LAN. Now it is possible for the end user to connect the INFOCUS Server PC to the NAM using either the LAN or a COM Port connection. If using a COM port connection, data is sent from the NAM containing either PRELUDE or CINPHONY ACD to the INFOCUS PC via a Serial (COM) Port. If an end user wishes to

install other INFOCUS Server PCs to view real-time data, the end user must use a Broadcast Box and connect the Server PCs with RS-232 cabling. It should also be noted that if using a COM Port connection, the Reports application in INFOCUS is not available. The ACD Reports are not available, because they cannot be passed by a COM Port to the INFOCUS Server in a Web page format. It is also only possible to display 24 of the possible 80 configured groups using a COM connection.

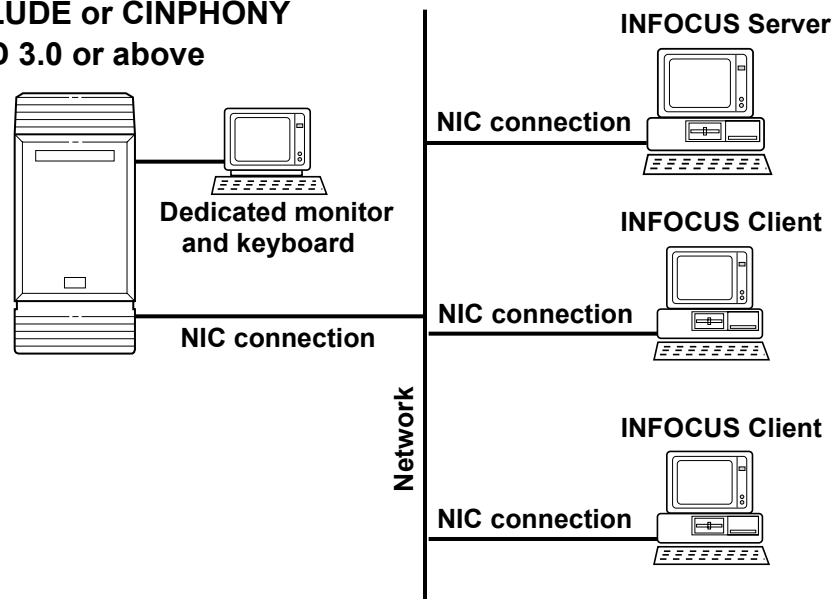
**Norstar Applications Module
with PRELUDE or CINPHONY
ACD 3.0 (or above) Suite**



LAN Connection

The INFOCUS Server also connects to the Norstar Applications Module in a LAN environment. In this scenario the LAN connection is provided from the NIC (Network Interface Card) on the Applications Module to an appropriate LAN interface. INFOCUS Server software is then loaded on a customer provided PC that is connected to the LAN. Additional INFOCUS Client software can then be added to other PCs on the LAN. (Note: the INFOCUS Server software is included with the PRELUDE and CINPHONY ACD 3.0 and above software. (INFOCUS Client licenses are available in 1 and 5 user add-on license options.)

Norstar Applications Module with PRELUDE or CINPHONY ACD 3.0 or above



INFOCUS Remote Site Connectivity

For even greater flexibility, the INFOCUS Client software may be installed at an off-premise location and can be connected to the main ACD site using the Internet and/or Modem.

- **LAN Access to Status Display and Report View and Print:**
To allow remote access to the Status Displays and Report View and Print options the INFOCUS Server PC, located at the ACD 3.0 (and above) site, must be registered as a web-site through an Internet Service Provider (ISP). INFOCUS Clients then access the Server through a web connection. Note: A LAN environment is required and the ACD Administration is not available remotely through the Internet connection.
- **Modem to Modem Access to ACD Administration:**
The INFOCUS Server and INFOCUS Client PCs may access the ACD Administration through a modem to modem connection to the Norstar Applications Module at the main site. Remote access to the Status Display and the Report View and Print function are not available through this interface.

Product Delivery

The INFOCUS software is delivered on a CD-ROM. This CD-ROM contains all required software for all INFOCUS functions. One INFOCUS Server package comes with the PRELUDE and CINPHONY ACD 3.0 and above products. INFOCUS Client software licenses are available as optional add-ons in 1 license and 5 license packages.

Add-Ons

Automated Attendant

The Automated Attendant for PRELUDE and CINPHONY ACD is a cost effective solution for businesses that wish to direct calls to several different areas.

Automated Attendant commands can be used in the routing table to provide the caller with a recorded message. The caller then follows announcement instructions to direct their call. The caller can press designated keys to direct the call to a Group, extension, answering device, or voice mail system or, if a caller has been on hold for a designated amount of time, the call can be bumped to the Automated Attendant where the caller can be offered options. Calls can be transferred out of PRELUDE and CINPHONY or directed to a specific call center group.

Status Display For Windows 3.1™ or Windows 95/NT™

This Windows based application can be installed on one to four Remote PCs (connected to the Norstar PRELUDE and CINPHONY ACD processor) to receive Agent Statistics, Group Statistics, System Statistics, and Voice Port Status.

A Status Display for Windows Broadcast Box must also be installed, if connecting more than one PC.

The user can then display this data in several ways: Group Detail Status, Group Summary Status, System Status, Voice Port Status, Graphical Group Status, and Graphical System Status.

The user can also customize the status display by selecting one or more Groups, Alarm Limits on statistics, and Agent Statistic field colors. These are Windows based “Pop Out” real-time status screens.

INFOCUS Client Software Licenses

INFOCUS Client software licenses are available in increments of one or five, to provide access to additional INFOCUS connections. The INFOCUS Client software facilitates access to ACD Status Displays, Report View and Print functions, and ACD Administration from a customer provided PC.

The Status Display component provides color-coded call center statistics in both tabular and graphic format. This status display information is accessed using a standard browser interface (for example, Internet Explorer). The Report View and Print uses the same standard browser interface to allow the customer to view and print ACD reports that have already been generated. The INFOCUS Client PC is connected in a LAN environment to the INFOCUS Server provided with PRELUDE and CINPHONY ACD 3.0 and above.

The PC running either the INFOCUS Server software or INFOCUS Client software must be provided by the customer and must have Windows 95 or Windows NT installed.

Wallboard Support Software (for versions prior to 3.0)

A wallboard displays Group Name as well as:

- Number of Calls in Queue,
- Longest time of call in queue,
- Average time to answer,
- Average time to abandon.

The wallboard provides a great self-management tool for agents and supervisors.

Note: A wallboard must be supplied by the customer or distributor. Either a wallboard or Status Display for Windows can be connected to Norstar PRELUDE and CINPHONY ACD. They cannot run simultaneously. However, INFOCUS can run simultaneously with a wallboard.

Printer Requirements

An Epson LX300 dot matrix printer is available as an option to print reports from the ACD systems. Norstar PRELUDE and CINPHONY ACD can support over 125 different types of printers. Printer requirements include: 132 characters per line, parallel port, HP Laser Jet or Epson Compatible.

Upgrading Voice Channels

Upgrading an MS-BIC based system

Total number of Voice Channels	PRELUDE 4 channel	CINPHONY I 8 channel	CINPHONY II 8 channel
4			
6	1 ACD key		
8	2 ACD keys		
10 (see Note 2)	MS-PEC, 3 ACD keys	MS-PEC, 1 ACD key	MS-PEC
12	MS-PEC, 4 ACD keys	MS-PEC, 2 ACD keys	MS-PEC
14	MS-PEC, 5 ACD keys	MS-PEC, 3 ACD keys	MS-PEC, 1 ACD key
16	MS-PEC, 6 ACD keys	MS-PEC, 4 ACD keys	MS-PEC, 2 ACD keys

Note 1: The CINPHONY II software includes the capability for 12 voice channels. When an MS-PEC is added to the Norstar CINPHONY II - 8 channel system it is automatically upgraded to 12 ports. An ACD Key is not required to turn on the additional channels of the MS-PEC card.

Note 2: When upgrading to a 10 Channel system it is necessary to add 8 MB of RAM (for a total of 16 MB in the system). For application co-residency, memory must be upgraded to at least 32 MB.

Upgrading a DVC based system

Total number of Voice Channels	PRELUDE 4 channel	CINPHONY I 4 channel	CINPHONY I 8 channel	CINPHONY II 12 channel
4				
6	DVC	see Note 1		
8	DVC, ACD key	DVC see Note 1		
10 (see Note 2)	2 DVCs, ACD key	2 DVCs	DVC	
12	2 DVCs, 2 ACD keys	2 DVCs, ACD key	DVC, ACD key	
14	3 DVCs, 2 ACD keys	3 DVCs, ACD key	2 DVCs, ACD key	DVC
16	3 DVCs, 3 ACD keys	3 DVCs, 2 ACD keys	2 DVCs, 2 ACD keys	DVC, ACD key

Note 1: The CINPHONY I software includes the capability for 8 voice channels. When a DVC is added to the Norstar CINPHONY 1-4 channel system it is automatically upgraded to 8 ports. The ACD 2 Channel Software Activation Key that comes with the DVC card is not used, nor is a second Key required to turn on the second two channels of the DVC card.

Note 2: When upgrading to a 10 Channel system it is necessary to add 8 MB of RAM (for a total of 16 MB in the system). For application co-residency, memory must be upgraded to at least 32 MB.

The preceding chart shows the components that need to be added to the base system to reach the desired number of channels. All Norstar PRELUDE and CINPHONY ACD modules can be expanded from 2 to 16 voice channels in two channel increments, all within the same chassis.

Depending upon the configuration of the Norstar PRELUDE and CINPHONY ACD, when two additional channels are required, the upgrade is accomplished by adding either an MS-PEC card or enabling two voice channels on the MS-BIC or MS-PEC card. With older systems using DVC cards, expansion is accomplished by adding either a DVC card or enabling 2 channels on a DVC card via a Software Keycode.

An MS-PEC card (or DVC on older systems) is required if there are no unused channels on any of the cards already installed. A 2-channel Software Key is required to enable unused voice channels on an installed MS-BIC, MS-PEC, or DVC card.

The 2-channel activation Software Key is a software diskette that is used to enable the voice channels on the MS-BIC or MS-PEC (or DVC) card. The diskette contains an authorization code and instructions on how to perform the upgrade. (A call will be made to the Cintech support line to enable the voice channels.) The 2-channel software activation diskettes may be used only once and cannot be used on other systems.

Integration with Norstar

Norstar PRELUDE and CINPHONY ACD are designed to be integrated with Norstar systems. Both PRELUDE and CINPHONY use the Norstar telephone LCD window to walk users through using features when it is appropriate to do so.

For example, if an agent presses the “Unavailable” key before logging in, a message will instruct the agent to login first. The functions of the softkeys will also change according to activity, bringing up functions when it is appropriate and thus “teaching” the agent how to use the system.

On the bundled version, an MS-BIC card and MS-PEC cards (or DVC cards on older systems) are used to provide the voice capability. PRELUDE and CINPHONY on the Norstar Application module use both B1 & B2 channels on Norstar. This means that one station port on the Norstar system provides access to two voice channels. This is an important consideration for customers close to capacity on station ports.

Norstar PRELUDE and CINPHONY have the ability to integrate Calling Line ID features directly from the Norstar system without adding additional hardware devices.

Norstar PRELUDE and CINPHONY ACD interact seamlessly with Norstar, interface with its users exactly as Norstar does, and offer greater flexibility and features than any ACD system available to smaller call centers today.

Benefits of Scalability in PRELUDE and CINPHONY

- Enhancements can be added via a software upgrade,
- Easy migration from PRELUDE to CINPHONY via software upgrade,
- Eliminates the need to replace the main system. Each Norstar PRELUDE and CINPHONY ACD model may be expanded up to 32 voice channels within the same chassis.

Norstar PRELUDE and CINPHONY ACD modular design means that your customers can:

- Build a call center to meet their needs today, and
- Add features, functionality and capacity as their Norstar PRELUDE and CINPHONY ACD requirements grow.

Norstar Voice Messaging positioning

Calls can be transferred between Norstar Voice Mail, Flash Voice Mail systems and Norstar PRELUDE and CINPHONY ACD. Calls may be transferred from the Voice Messaging system into the ACD or from the ACD into the voice messaging system.

Norstar Flash ACD, MINUET, PRELUDE and CINPHONY Feature Comparisons

Capacities	Flash ACD	MINUET ACD	PRELUDE	CINPHONY	
				I	II
2500 set Agent support		√	√	√	√
Agent Help				√	√
Agents logged in	10	10	15	30	80
Agent- Record Call				√	√
Agent Selection - Longest Idle	√	√	√	√	√
• Round Robin			√	√	√
• Top-down	√	√	√	√	√
ANI support			√	√	√
Announcements: Recorded	10	6	8	16	72
Announcements: Simultaneous (subtract # of channels reserved for Agent Record)	4	4	**	**	**
Answer Forcing with ZIP Tone	√	√	√	√	√
Auto Login of Agents (ACDLOGIN.EXE)			√	√	√
Auto Logout of Agents	√	√	√	√	√
Average QTime Announcement			√	√	√
Call Categorization		√		√	√
CLID support	√		√	√	√
Companion C3050 and C3060 Support		√	√	√	√
Configuration Changes - Real-time	√	√	√	√	√
Configuration Changes - Scheduled			√	√	√
Configured Agents	20	20	60	120	240
Configured Supervisors		-	-	4	24
Data Export				√	√
Delayed Answer (Routing Command)	√	√	√	√	√
DID/DNIS Target Line Support				√	√
Emergency Routing				√	√
Expected QTime Announcement			√	√	√
Groups	2	2	3	6	80
Groups Agents Simultaneously Logged-in	2	2	3	6	80
Groups per Supervisor		-	-	6	80
INFOCUS Server software			√	√	√
Initial Installed Voice Channels	2 & 4	4	4	4 & 8	12
Language Station Set Support—English, French and Spanish	√	√	√	√	√
Lines	15	15	30	80	120
Line Transfer (Routing Command)			√	√	√
Link Transfer (Routing Command)			√	√	√
Maximum Installed Voice Channels	4	4*	32	32	32

Capacities	Flash ACD	MINUET ACD	PRELUDE	CINPHONY	
				I	II
Overflow	√	√	√	√	√
Overflow Groups	1	1	1	3	8
Password Protection	√	√	√	√	√
Priority Queuing				√	√
Real-time Group Status Display			√	√	√
Real-time System Status Display			√	√	√
Routing Commands					
• Alert				√	√
• Announcement	√	√	√	√	√
• Disconnect		√	√	√	√
• Distribute	√	√	√	√	√
• Forced Announcement	√	√	√	√	√
• Go to Step	√	√	√	√	√
• Group		√	√	√	√
• Increased Priority				√	√
• Line Transfer			√	√	√
• Link Transfer			√	√	√
• No Answer		√	√	√	√
• Set Priority				√	√
• Transfer to		√	√	√	√
• Voice Mail transfer	√	√	√	√	√
Routing Tables per Group	2	2	2	2	2
Silent Monitor				√	√
Station set or Screen-based programming	Station set	Station set	Screen	Screen	Screen
Steps in Routing Table	6 Day, 2 Night	6 Day, 2 Night	8	16	16
Supervisors per Group		-	-	1	1
Telephone Service Factor (TSF) on Status Display			√	√	√
Wrap	√	√	√	√	√

* Physical voice channels are provided by the Norstar Applications Module and are used with other applications such as Norstar Voice Mail 3.0.

** Equal to the number of installed voice channels minus the number of channels reserved for "Agent Record".

Options

Add-Ons	Flash ACD	MINUET	PRELUDE	CINPHONY	
				I	II
Management Information System (MIS) reporting	√				
Auto Attendant (Routing Command)			√	√	√
INFOCUS Client software			√	√	√
Number of Recorded Announcements w/AA			14	24	96
Number of AA menus			6	8	24
Status Display for Windows™			√	√	√
Wallboard Software Support	√*	√	√	√	√

* Wallboard Software support is a standard feature on Flash ACD, MINUET, PRELUDE and CINPHONY 3.4.

Standard Reports

Capacities	Flash ACD	MINUET	PRELUDE	CINPHONY	
				I	II
Abandoned Call Report			√	√	√
ACD Call Profile Report			√	√	√
ACD Call Profile Summary Report			√	√	√v
Agent Profile Report			√	√	√
Agent Profile by Group Report			√	√	√
Agent Summary			√	√	√
Busy Line Report			√	√	√
Call Categorization Report				√	√
Call Categorization by Agent Report				√	√
Group Profile Report			√	√	√
Destination Number Report			√	√	√
Historical Reporting			Unlimited	Unlimited	Unlimited
Line Profile Report			√	√	√
Line Profile Summary Report			√	√	√
Monthly Summary Report			√	√	√
Overflow Report			√	√	√
Report Generation - On-demand			√	√	√
Scheduled Report Generation			√	√	√
Routing Table Report			√	√	√
Set-based statistics		√*			
System Configuration Report			√	√	√

* MINUET ACD does not support printed reports. However, statistics are displayed on the station set LCD for a rolling 21 periods of time. Switching between Day and Night routing determines a statistical period beginning and end. At any time users can look at the categories for each of the prior 21 periods. Statistical categories include: number of calls answered, number of calls abandoned, number of calls disconnected, average time to answer, average time to abandon and number of calls per category code.

Norstar Flash ACD, MINUET, PRELUDE and CINPHONY Feature Descriptions

Unless otherwise specified, the features listed are applicable for all four products.

Agent

An agent is an individual who answers an ACD call. Agents are assigned to a group or multiple groups.

Agent HELP

CINPHONY only.

By pressing a feature key on a Norstar set, an Agent can request Help from the Supervisor while on a call. The name of the Agent will display on the Supervisor's station set.

Agents Logged In (also known as Active Agents)

The total number of Agents that can be logged in at one time: Flash ACD (10), MINUET (10), PRELUDE (15), CINPHONY I (30), and CINPHONY II (80).

A highly trained agent can log into more than one group when appropriate. This helps to effectively utilize multi-skilled agents.

Agent ID

Each individual agent must have an "Agent ID". The call center applications use the agent ID number to login and identify an agent to the system.

Agent Record Call

CINPHONY only.

While on a call, an Agent can record the call at the Norstar set. Once the call is recorded, the Supervisor can use the Play Call function to play back recording.

Agent Selection—Longest Idle

This call routing method selects the agent who has been available the longest since last handling a call.

Allows you to route calls to agent in such a way that workload is distributed equitably and the wait in queue is minimal.

Agent Selection - Round Robin

PRELUDE and CINPHONY only.

This call routing method is used to send a call to the next available Agent listed after the agent who handled the last call.

Agent Selection—Top Down (Preferred)

This call routing method is used to send a call to the first available agent closest to the top of the list.

The top down method is frequently used when it is desired to send calls to the agent with the most expertise.

ANI: Automatic Number Identification

PRELUDE and CINPHONY only.

ANI is offered by the long distance carrier and provides incoming caller's telephone number. ANI information appears on the agent's Norstar station set display when the ACD call arrives.

PRELUDE and CINPHONY call center applications can route and prioritize calls based on the incoming number.

Announcements

Voice announcements are played to callers to encourage them to hold while they wait for an

available agent or to promote products and services.

Voice announcements can be quickly changed at the supervisor's Norstar set, making it easy to create announcements daily or as conditions change.

Announcements: Recorded Announcements

The total number of Recorded Announcements allowed: Flash ACD (10), MINUET (6), PRELUDE (8), CINPHONY I (16), and CINPHONY II (72).

An Announcement is played for a caller when it is evoked as a step in a Routing Table using the Announcement, Forced Announcement, or Automated Attendant Routing Command.

If the Automated Attendant Add-On is being used in PRELUDE or CINPHONY, totals for all levels increase. The Recorded Announcement Configuration screen keeps track of the announcements that were recorded.

Announcements: Simultaneous Announcements

The total number of Recorded Announcements that can be played at one time is directly related to the number of Voice Channels that are active.

Answer Forcing with Zip Tone

Answer Forcing applies only to Agents wearing headsets. If Answer Forcing is enabled for an Agent (Agent Configuration screen), a call is automatically sent to an Agent when the Agent is available to take a call. A zip tone precedes the call to let the Agent know that a call is being forced to the headset.

Auto Login of Agents

An external auxiliary application that can be loaded with Norstar PRELUDE and CINPHONY ACD software. This application allows the user to automatically login non-human Agents represented by a device or application.

Auto-Logout of Agents

Auto-Logout is a feature that is activated if an

available agent does not answer the ACD call within the specified time period. If the time threshold is exceeded, the available agent will be logged out and the call redirected to the next available agent.

A feature that prevents a no-answer situation. It ensures a call is answered by an available agent, which leads to improved customer service.

Average QTime Announcement

PRELUDE and CINPHONY ACD 3.3 or higher only.

An announcement to the caller informing them of the average time they will have to wait before their call is answered.

Provides valuable information to the callers in queue as to how long they may wait before being answered by an available agent.

Call Categorization

MINUET and CINPHONY only.

When a call is taken by an Agent, a 2-digit (MINUET) or a 1 to 12 digit (CINPHONY) Category Code can be entered on the Norstar set during the wrap time after the call is completed. The category code can be required or optional by group, and appears on the Norstar display after an agent completes a call.

Allows a business to determine what types of calls are coming in and organize resources accordingly.

Caller Directed Routing

PRELUDE and CINPHONY only.

Provides the ability to route incoming ACD calls based on DTMF digits entered by a caller. This allows a caller to enter an identifiable number such as a customer ID number or product code. This number routes the call to the appropriate ACD group. ACD 3.2 provided 1 Caller Directed Routing table, ACD 3.3 and higher provide 3 Caller Directed Routing tables.

Calling Line Identification Routing (CLID/ANI)

PRELUDE and CINPHONY only.

Incoming CLID is offered by the local telephone company. CLID and ANI calls coming in on an ACD line can be routed to a Group by the Originating Number specified.

Can be used to prioritize calls so that specific callers (for example, the company's most important clients) are answered first.

Calls Queued Station Set Display

The total number of calls in queue and time of longest call in queue for a Group. An Agent can view this statistic on the Norstar set while on or off a call. An agent does not have to be logged into the ACD to access this information.

Agent can determine how busy system is and use this information to manage time on calls or determine when to take a break.

Companion C3050/C3060 Compatible

Wireless Phone Set Support.

Provides agent capabilities equivalent to the Norstar desktop telephones.

Provides a better fit where agents often perform additional tasks that require increased mobility.

Configured Agents

The total number of Agents that can be configured: Flash ACD (20), MINUET (20), PRELUDE (60), CINPHONY I (120), and CINPHONY II (240).

Provides system security.

Configured Supervisors

CINPHONY only.

The total number of Supervisors that can be configured: CINPHONY I (4) and CINPHONY II (24).

Disconnect Supervision

Disconnect Supervision is the change in the transmission of a call when it goes from "off hook" to "on hook" or in other words, when the caller hangs up. The call center applications use

Disconnect Supervision to report on abandoned calls (that is, when a caller hangs up before an agent becomes available).

A business can determine how well it is reaching customers and make decisions (such as staffing, hours of operation) according to this information.

Data Export

CINPHONY only.

System Data can be exported to a file by date and time ranges. The file is given a .EXP extension and listed in Report/File Maintenance so the user can copy or move the data (file) to floppy disks. This allows call data to be exported to other popular software applications such as Microsoft Word, Access, Excel, Quattro Pro for Windows, Dbase, Lotus 1-2-3 and many more.

Allows a business flexibility when tracking and using call center statistics.

Delay Answer: Routing Command

Delays answering incoming calls for a specified time period. The caller hears ringing until the delay passes or an agent becomes available.

This feature allows the ACD to recognize CLID since the CLID information is normally delivered between the first and second rings, and delays answering a call when no agent is available. This can amount to significant savings on 800/888 line charges.

DID

CINPHONY only.

When a call comes in on a Line designated as a DID, it can be routed to a specific Group. The Destination Number Configuration table enables the user to list these numbers.

DNIS

CINPHONY can route and prioritize calls based on the number the customer dialed. The

Destination Number Configuration table enables the user to list these numbers.

A business can improve customer service, for example, ensure its best customers are given priority or route calls from different regions to a specific group of agents.

Emergency Routing Groups

CINPHONY only.

Emergency Routing allows a single group to handle all calls during an emergency. To activate, the supervisor presses a feature key. Once activated, all calls are rerouted to the designated emergency group. A call that is directed to the emergency group will follow the group's routing table. Only one Emergency Group can be configured.

Ensures a call center's calls are answered, even in an emergency situation.

Expected QTime Announcement

PRELUDE and CINPHONY ACD 3.3 and higher only.

An announcement to the caller using a calculation to inform the caller of how long they will have to continue to wait before their call is answered. Expected QTime incorporates the amount to time the caller has already been waiting.

Provides valuable information to the callers in queue as to how long they may have to continue waiting before being answered by an available agent.

Groups

A group is a collection of individual agents qualified to answer a specific type of call. For example, a company may group its agents by Customer Service, Accounts, Order Desk and Service Installation. This makes a total of 4 groups within the call center. An individual agent can be assigned to many different groups. Also called "Splits" or "Queues." The total number of Groups that can be configured: Flash ACD (2),

MINUET (2), PRELUDE (3), CINPHONY I (6), and CINPHONY II (80).

Provides flexibility to match business needs with personnel.

Groups Agent Simultaneously Logged-in

The total number of Groups into which one Agent can log in, is directly related to the number of Groups that can be configured: Flash ACD (2), MINUET (2), PRELUDE (3), CINPHONY II (4), and CINPHONY II (24).

A highly trained agent can be logged into any or all groups.

Helps effectively utilize multi-skilled agents.

Groups per Supervisor

CINPHONY only.

The total number of Groups to which a Supervisor can be assigned is directly related to the number of Groups that can be configured: CINPHONY I (4) and CINPHONY II (24).

Group Voice Mailboxes

Flash ACD only.

Each Flash ACD group has a general delivery voice mailbox. This capability is a function of the Flash ACD application and is separate from the Flash Voice Mail application. The caller can reach these mailboxes by pressing "0" during an ACD announcement that offers the caller the option to transfer to the group mailbox. When a message has been left, the appropriate agents' set will display that there is a message in the group mailbox.

INFOCUS Software

PRELUDE and CINPHONY only.

Software component for customer supplied PCs connected to the NAM. Provides access to ACD Status Displays, Report View and Print function and ACD Admin from a LAN or remote PC.

Enables the accessibility of information for call center Supervisors, ACD Agents, Executives and Knowledge Workers throughout the organization.

Initial Installed Voice Channels

The number of Voice Channels supplied when the ACD software is first installed: Flash ACD (2 or 4 depending on model), MINUET (4) PRELUDE (4), CINPHONY I (8), CINPHONY II (12).

Language Support

Flash ACD and MINUET systems support English, French and Spanish for Agents from Norstar station sets. Whatever the telephone is set to, the ACD automatically sends matching messages to that set.

PRELUDE and CINPHONY systems support English, French and Spanish for Agent and Supervisor functions from Norstar sets. Monitor and Key functions support English and French.

Companies can use the language of their business.

LCD prompted set-based programming

Flash ACD and MINUET only.

Norstar Flash ACD and MINUET can be programmed from any M7310 or M7324 station set. The programmer is led through a series of prompts using the station set soft keys to make selections and the keypad to enter data.

Norstar's superior integration capabilities provide a simple and easy user interface for simplified installation, programming and administration.

Lines

The total number of Lines that can be configured: Flash ACD (15), MINUET (15), PRELUDE (30), CINPHONY I (80), and CINPHONY II (120).

Maximum Installed Voice Channels

Flash ACD provides up to 4 voice channels (model dependent) and the voice channels can be shared with Flash Voice Mail. MINUET supports a maximum of 4 voice channels. PRELUDE and CINPHONY can be expanded to support a maximum of 16 voice channels.

Management Information System (MIS)

Optional reporting package for Norstar Flash ACD. Provides Real-time, current and historic reports:

- Waiting Time,
- Abandoned Call,
- Incoming Call,
- Agent Activity,
- Average time,
- Abandoned CLID Report,
- System Capacity Report,
- Call Profile,
- Agent profile Report,
- Summary Report,
- Configuration Report.

Overflow

This feature is useful for expediting call processing and allows calls to be made available to an alternate group other than the one for which the call was originally designated. The maximum number of calls that can wait for the group is specified in administration. Once the threshold is reached, calls are automatically made available to the alternate group in addition to the one for which the call was originally designated. If no agents are available in the second group, Norstar continues to monitor both groups for an available agent.

Useful for expediting call processing and expands the agent pool so that more agents are available to answer calls. Increases number of calls handled, reduces customer hold time and increases agent productivity.

Overflow Groups

Once the Overflow threshold is reached, groups are added to the pool of agents available to take the call. The total number of Overflow Groups that can be selected for the Group where calls are first routed: Flash ACD (1), MINUET (1),

PRELUDE (1), CINPHONY I (3), and CINPHONY II (8).

This feature is useful for expediting call processing and expands the agent pool so that more agents are available to answer calls.

Password Protection

Flash ACD and MINUET: Set-based access from a Norstar station is password protected.

CINPHONY and PRELUDE:

The Configuration Menu, Reports Menu, Maintenance Menu, Restart, and Quit can be password protected on the ACD main menu by using a password.

Provides system security.

Priority Queuing

CINPHONY only.

This feature allows customers to be given preferential answering status. Calls are first given to agents based on the call priority and then its time in queue. If no incoming calls have an assigned priority, the ACD will distribute the longest waiting call. Priorities can be set three different ways:

- **Group priority** assigns a priority to each group. You can place a higher priority on groups whose callers should be handled first, (for example, new orders versus repeat orders). When a call is transferred to a group, it assumes the priority of the group.
- **Line Priority** assigns each incoming line a priority from 1 (highest priority) to 10 (lowest priority). When a call comes in, it is assigned the priority of its line. Calls on lines with a higher priority will be answered before calls on lines with a lower priority regardless of the lower priority calls time in queue.

This is useful for providing preferred customer with a “special” phone number to ensure they receive the highest level of service. See ANI, CLID, DNIS and DID.

- **Routing Command Priority** allows a call’s priority to change as it spends time in queue. See Routing Command.

Real-time Configuration Changes

Flash ACD and MINUET: Changes are made, saved, and updated immediately from the system administration set.

CINPHONY and PRELUDE:

When changes are made and saved on Agent, Group, Supervisor, Emergency Group, or Line Configuration screens, these changes can be updated immediately from the Update Configuration screen.

Allows the system to respond immediately to situations requiring configuration changes such as unexpected heavy call load.

Real-time Group Status Display

PRELUDE and CINPHONY only.

The call activity and status of Agents in a single group can be viewed on the Group Status Display screen. The Group Status Displays are color-coded to quickly identify a specific area of interest and the status of Voice Channels also displays in real-time.

The display provides detailed information about a specific group and allows supervisors to identify problems as they occur.

Real-Time System Status Display

PRELUDE and CINPHONY only.

The call activity and status of all Groups in the system can be viewed on the System Status Display screen. The display shows statistics for eight groups at a time and shows activities such as an agent logging in, or an agent becoming available for another call, as it happens. The ACD System Status Displays are color-coded to quickly identify a specific area of interest. The status of Voice Channels also displays in real-time.

Allows efficient real-time management of system.

Routing Commands

Routing Commands are specific instructions used in the routing table for determining how to distribute an ACD call.

Flash ACD and MINUET offer up to 10 different routing commands. PRELUDE and CINPHONY offer up to 15 different routing commands.

Routing tables allow callers to be routed differently after hours.

- **Alert:** CINPHONY only. When a call reaches this command in a Routing Table, a ring is sounded at a specified Norstar set to alert a Supervisor or an Agent that a call has reached this alert status. The Alert Routing Command can be entered in a Day and/or Night Routing Table.
- **Announcement:** Plays the assigned prerecorded announcement. If an agent becomes available before the announcement concludes, the announcement will be interrupted and the call distributed to the agent.

Encourages callers to hold and can be used to advertise products and services.

- **Delay Answer:** This command instructs the ACD to delay answering incoming calls for a specified time period. The caller hears ringing until the delay passes or an agent becomes available.

Saves 800 number charges when no agents are available.

- **Disconnect:** Ends the call.
- **Distribute:** Searches for an available agent to answer the incoming call.

Allows businesses to customize the time calls are held in queue before an announcement is played.

- **Forced Announcement:** Play an announcement that cannot be interrupted. If an agent becomes available during a forced announcement, the caller will hear the entire announcement before his call is distributed to an agent.

Great for advertising products and services before calls are transferred to agents.

- **Go to Step:** Functions as a loop command. This is used to send a call to different steps within the routing table.
- **Group:** This command sends the call to the other ACD group to follow that group's routing commands.
- **Increased Priority:** CINPHONY only. Incrementally raises the call value within the queue so that the call is answered quickly. For example, increase the priority of a call from 5 to 4 after the call has waited in queue for longer the one minute. See Priority Queuing for additional information.
- **Line Transfer:** PRELUDE and CINPHONY only. This command transfers a call to an external number by dialing out on a separate trunk and connecting the incoming and outgoing calls. Transfer will remain in use for the duration of the call. The call can be transferred to a specified Line or Line Pool. The Line Transfer can be entered in a Day and/or Night Routing Table.
- **Link Transfer:** PRELUDE and CINPHONY only. The Link Transfer Routing Command can be entered in a Day and/or Night Routing Table. When a call reaches a Link transfer step, the call will be transferred via a flashhook to a phone number outside of the Norstar system. This is normally used on Centrex lines or when the Norstar system is installed behind a PBX.

- **No Answer:** When this command is the first step of a Routing Table, the call will continue to ring until the caller hangs up. This is typically used after hours when a business does not wish to incur 800/888 line charges.
- **Set Priority:** CINPHONY only. Establishes the call priority within the queue. See Priority Queuing for additional information.
- **Transfer to:** Transfers a call to an internal Norstar extension.
- **Voice Mail Transfer:** When a call reaches this command in a Routing Table, the call will be transferred to a specified Norstar Voice Mail or Flash Voice Mail mailbox. The Voice Mail Transfer command can be entered in a Day and/or Night Routing Table.

Allows callers to leave messages rather than wait on hold.

Routing Tables

To distribute incoming calls effectively, the ACD needs a series of instructions. These instructions are found within the routing table.

Routing Tables Per Group

For each Group, a user can specify a Day and a Night Routing Table.

Scheduled Configuration Changes: Routing Command

PRELUDE and CINPHONY only.

When changes are made and saved on Agent, Group, Supervisor, Emergency Group, or Line Configuration screens, these changes can be scheduled for update on a specific date and time.

Silent Monitor

CINPHONY only.

A Supervisor can use this function at the Norstar set to monitor an agent's phone conversation without being heard on the line. The supervisor

also has the option of joining the call.

This is valuable for monitoring the quality of customer service and for training new agents.

Steps in Routing Table

The total number of Steps (Routing Command entries) that can be configured for the Day and Night Routing Tables: Flash ACD and MINUET (6 for day and 2 for night), PRELUDE (8), and CINPHONY (16).

Supervisors Per Group

CINPHONY only.

The total number of Supervisors that can be assigned to one Group in CINPHONY I (1) and CINPHONY II (1).

Telephone Service Factor (TSF) on Status Display

PRELUDE and CINPHONY only.

The TSF is a gauge for measuring the service level of the call center. It is the percentage of calls answered within a Threshold period (in seconds or minutes) for the TSF Interval (in seconds or minutes). For example, a call center may set a goal of answering 80% of all ACD calls within 30 seconds. If the TSF is only 60% at a given time then the call center is short of the TSF goal by 20%. PRELUDE and CINPHONY display the TSF on the real-time group status screen as well as on the ACD Call Profile Report.

Enables a business to track how efficiently the call center is working.

Voice Channels

All ACD systems use voice channels to play recorded messages and for recording conversations with the Agent Record Call feature.

Wallboard software support

Wallboard support software is included within the ACD software. The software allows connection of a wallboard to Flash ACD, MINUET, PRELUDE or CINPHONY to display the following information: group number, number of calls in queue, longest time of a call in

queue, number of agents unavailable.

The number of agents unavailable represents the number of agents who have logged in but are currently in one of the following states: manually unavailable, on a non-ACD incoming or outgoing call, or on an intercom call.

Wrap

The Wrap time is given to agents between answering ACD calls. This allows agents to categorize calls or do paper work between calls. Flash ACD and MINUET: Wrap length is user defined as between the range of 0–60 seconds. If Prompted Categorization is being used, a minimum of 10 seconds Wrap time is required. PRELUDE and CINPHONY: The 3 ways to specify the length of wrap time include:

- Automatic: specified time period (duration) for the wrap time.
- Manual: the Agent must enter the Cancel Wrap Feature Code to end wrap time.
- None: the Agent becomes available as soon as the call has ended.

It serves to improve employee morale and customer service as the additional time allows agents to prepare for the next incoming call and to ensure that records of the last call are complete.

2500 Analog Station Set

This feature includes support for 2500 telephones, cordless phones and headsets when used in conjunction with an ATA or Analog Station Module.

The 2500 set can be used to perform the following agent functions: Login, Logout, Available, and Unavailable. A Login/Logout DN and Available/Unavailable DN must be configured in system wide administration in MINUET and at the System wide Parameter screen in PRELUDE and CINPHONY.

Allows for alternative types of sets or devices to be used as agent stations.

Standard Reports descriptions

Through the Reports menu, the Norstar PRELUDE and CINPHONY database can be accessed and management reports can be generated, which help companies understand how agents and the system are performing.

Abandoned Call Report

This report lists and totals calls in which the caller waited on hold and hung up after a certain time period. It details Group, Date, Line, Time, Duration, Incoming Number and Name of each call abandoned during a specified time period. If available, ANI/CLID and DNIS numbers will be provided.

Allows a business to track how well it is reaching customers.

ACD Call Profile Report

This report profiles the count or percent of ACD calls received during a specified time period. The report lists each time period and provides information on how quickly a group is answering ACD calls. It also tracks the number/percent of abandoned calls, calls picked up and disconnected, and calls transferred for each time period.

Allows a business to see how efficiently the call center is working and where improvements can be made (for example, staffing, hours of operation).

ACD Call Profile Summary Report

This report provides a summary-level view of the information presented in the ACD Call Profile Report. It supplies a summary of ACD calls received, including abandoned, disconnected and transferred calls, by group for a specified time period.

This report is useful in evaluating group assignments, staffing levels, and call activity by group.

Agent Profile Report

This report profiles an Agent's performance over a specified time period. It tracks the amount of logged-in time, time spent on ACD calls and how

that time was spent, time spent on non-ACD calls, number of calls answered, and number of times Supervisor help was requested.

Can be used as a time management or training aid.

Busy Line Report

This report provides the date, time, and duration when all Lines assigned to an ACD Group are busy.

Allows a business to track how lines are being used and when.

Call Categorization Report

CINPHONY only.

This report summarizes the call categorization information for a specified time period. It tracks the number of calls logged for each category.

Group Profile Report

This report profiles a Group's performance for a specified time period. It tracks the number of calls received, whether calls were answered or abandoned, average amount of time a call spent in queue before being answered or abandoned, average time spent on various aspects of ACD calls, and number of auto-logouts and requests for Supervisor assistance.

Enables management to see how well a specific group is working and whether any changes are required.

Group Overflow Report

This report summarizes the number of ACD calls overflowing to other Groups, which Groups received these calls, and the number of calls received by each Group. It also tracks the number of ACD calls overflowing from other Groups to this Group, and the total number of calls received, answered, and abandoned.

Line Profile Report

This report summarizes ACD line usage. It tracks, by specified time intervals, the number and duration of incoming and outgoing calls, summarizes ACD call activities, and provides a percentage of the interval the line was in use.

Line Profile Summary Report

This report provides a summary-level view of the information presented in the Line Profile report. It summarizes line usage by the ACD system.

This report is useful in:

determining the percentage of time a line was busy, evaluating each line and how it is being used, identifying problems, determining if additional lines are needed, and determining if there are excess lines.

Monthly Summary Report

This report summarizes the entire system or Group performance. It tracks number of calls received, calls answered, calls abandoned, time spent on various aspects of ACD calls, number of auto-logouts, Supervisor requests for assistance, and number of incoming, outgoing, and intercom calls during the reporting period.

Routing Table Report

This report provides the Step number, Routing Command, and value for the day and night Routing Tables. It tracks the number and percentage of all calls reaching each step on the Routing Table.

Enables a business to see how calls are flowing through a call center.

System Configuration Report

This report provides detailed information of selections made on the PRELUDE and CINPHONY Configuration screens. It is an important analysis tool for system support as well as a reference tool for the user to view system setup.

Report Generation - Scheduled

Current Call Data can be scheduled for processing and reports can be generated on a specified date and time.

Agent Profile by Group Report

This report profiles Agent performance by Group(s) for a specified time period. It tracks for each Group the amount of logged-in time, time spent on ACD calls and how that time was spent,

time spent on non-ACD calls, number of calls answered and number of times Supervisor help was requested.

Call Categorization by Agent Report

CINPHONY only.

This report summarizes the call categorization information for a specified time period for each Agent. It tracks the number of calls logged for each category by each Agent.

Destination Number Report

CINPHONY only.

This report summarizes DNIS and DID usage. It tracks number and average duration of all DNIS and DID calls received during specified intervals, and provides a summary of DID/DNIS call activities.

Norstar Computer Telephony Integration

Overview



Computer Telephony Integration (CTI) provides companies with the ability to turn a desktop computer into a powerful communications tool that can combine sight, sound, text, animation, video, graphics and other sophisticated telecommunication functions.

While not new, CTI has now come of age with affordable, feature-rich solutions for improving customer service and employee productivity. CTI has been around for many years. The early systems required extensive design and integration activities and, as a result, were limited to large installations that could justify the expense. The dissemination of voice messaging and ACD were major milestones in the commercialization of CTI applications. Now, the next phase of CTI deployment, Desktop CTI, has arrived. Gone are the days of expensive customized applications driven by proprietary links between the telephone system and the computer. The proprietary nature of the early applications served as a significant deterrent to a faster implementation of CTI. In 1995, a set of industry standards were established (TAPI and TSAPI) and proprietary links gave way to open protocols, a critical milestone for wide-scale development of desktop CTI.

With the explosion of Microsoft Windows 95/98 and Windows NT at the desktop, all of which include TAPI for no additional charge, TAPI was well on its way to becoming the de facto CTI standard. Norstar is aligning its CTI development with Microsoft TAPI, and will no longer continue development or support of TSAPI-based CTI applications.

Another new standard, Universal Serial Bus (USB) has been defined, with Nortel Networks taking a key role in the development of the standard. USB will make CTI at the desktop even simpler as it enhances bandwidth and uses a standard connection device. Consumers are now able to connect up to 127 peripherals to one USB port and implement multimedia applications. Most computers shipped since mid-1997 have USB capability, and this will assist in bringing CTI to even more desktops.

Norstar is an active participant in the development of technology to evolve telephone systems from voice-only services to multimedia services. There will be an increasingly wide variety of desktop CTI applications available to take advantage of this integration. Norstar leads the way with Personal Call Manager (PCM), which raises Norstar feature use by working with the TAPI Service Provider (TSP) to give the Windows[®] 95, 98 and Windows NT user a new, PC-based, Norstar user interface. Norstar PC Console, covered in detail later in this chapter, is also a part of the Norstar CTI portfolio.

Norstar and Desktop CTI

Norstar Desktop CTI combines the Norstar portfolio with the power of desktop computing. Turnkey enabler and applications software packages are available directly from Nortel and run on DR-5 or later Norstar systems.

TAPI is the primary and most common industry standard for Applications Programming Interfaces (APIs) and Norstar is aligning its CTI portfolio around the TAPI standard. Many TAPI-compliant applications are readily available, and can be easily used in conjunction with the Norstar to enable desktop CTI. In many cases, people are already using an application (such as contact management software) that is TAPI compliant.

In addition to TAPI applications, Norstar CTI enablers also support Norstar ACCESS applications.

The Norstar CTI portfolio includes CTI applications, the software enablers and the hardware connectivity devices. In addition to Norstar-developed and branded products, there is a wide variety of software available to CTI users. These additional applications are available through Nortel Business Affiliates, the Symposium Partners Program, and also “off the shelf.” More information about these additional sources is provided at the end of this chapter.

Presently, the Norstar CTI portfolio includes:

- Norstar Productivity Suite Version 1.2
 - Norstar Personal Call Manager 1.2,
 - TAPI Service Provider: Norstar TSP 2.1.
- Norstar PC Console,
- Norstar Computer Telephony Adapter (CTA) Hardware Devices
 - CTA 100,
 - CTA 160*i*,
 - CTA 200.

Desktop CTI Functions

Desktop CTI applications address an extensive number of unique applications, each one tailored to a specific market or niche. There are many types of CTI applications, everything from the most basic screen pop, to intelligent dialing and call routing, to coordinated call/screen transfer and screen based telephony. The most common ones are identified in the following chart, along with the associated Norstar application:

CTI Application Type	Norstar
<p>Screen Pop: also called Intelligent Answer or Call and Screen Synchronization. A screen pop refers to the change in the computer display that occurs simultaneously with the arrival of a new call. Using technologies such as ANI (Automatic Number Identification), CLID (Calling Line ID), or DNIS (Dialed Number Identification Service), the system searches the database for the caller's record and presents it to the computer display. The specific information about the caller will vary, depending upon the kind of information maintained by the company (for example, Name, address, priority level, previous purchases etc.) A contact management software such as Symantec ACT! or Microsoft Outlook is the most frequent database used for screen pops.</p>	<p>Screen pops are enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.1 (or earlier versions) • TAPI-compliant database application (for example, Symantec ACT!, Microsoft Outlook, Goldmine) • middleware such as Revolution Rapport (required in some circumstances to coordinate client applications).
<p>Contact Management: many popular contact managers are TAPI enabled, meaning that dialing directly from the contact record is possible, as are screen pops of the appropriate record based on incoming CLID.</p>	<p>Contact Management is enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.1 (or earlier versions) • Contact Management software such as Norstar Personal Call Manager (very basic contact manager); see chart of TAPI Applications later in this chapter for a list of TAPI enabled applications.

CTI Application Type	Norstar
<p>Screen-based Telephony: also called Softphone. Screen-based telephony is the process of using the PC keyboard and mouse to answer, transfer, conference and manage telephone calls.</p>	<p>Screen-based telephony is enabled on the Norstar using the following:</p> <ul style="list-style-type: none"> • CTA device • TSP 2.1 (or earlier versions) • Software application such as Norstar Personal Call Manager

Target Market for Norstar Desktop CTI

Wherever there is a person working at a desk with a telephone and a computer, there is an opportunity to implement a Desktop CTI application. Many of these people might not realize that they are candidates for CTI, as the myth that “CTI is only for call centers” is still prevalent in the marketplace. The following questions will help you and your customer identify whether they are a potential candidate for a desktop CTI application:

Do you:

- Ever say “I’ll transfer you, but if I lose you, the number is....”?
- Use a contact manager to look up a name and number, then dial the phone?
- Shuffle through business cards, sticky notes, address books to find a phone number that you “have right here somewhere”?
- Dig through files and paper while talking to someone to see what you talked about last time...then have to ask them to remind you?
- Have both a phone and a computer on your desk?
- Wish you could see who called but didn’t leave a message?
- Think you could use your time more efficiently?
- Think you could justify an expenditure if the payback is less than one year?

An answer of “yes” to any one of the above questions will indicate an opportunity to discuss CTI applications at the desktop and position a Norstar CTI solution.

Market Segments

The target market for Desktop CTI solutions can be segmented into 3 distinct groups. The Knowledge Worker and Informal Call Centers markets are the fastest growing segments of the CTI marketplace and represent a significant opportunity for Norstar CTI solutions.

Knowledge Worker

The knowledge worker is an employee that “generally has both a telephone and computer at their desk, and are not part of a formal call center. This includes all types of professionals working in offices, such as computer programmers, accountants, lawyers...”(Pelorus, 1997)

In the past, the knowledge worker was not considered a candidate for CTI applications, as CTI was traditionally used only in call centers. It is now being recognized that the knowledge worker can benefit from the same kinds of CTI applications that call center agents have access to, and that knowledge workers frequently talk to customers. The growth of PC and LAN use, even in very small businesses (for example, 1 or 2 employees) is also fueling the growth of CTI to the knowledge worker.

Informal Call Center

The informal call center is "...a newly emerging segment that brings together the traditional formal call center, knowledge workers, and SOHO professionals. While these people are not call center agents, they spend a good deal of their time answering the phone and responding to customer inquiries" (Pelorus, 1997).

Employees working in an informal call center often do not think of themselves as a call center, as they might not have an ACD system nor the traditional agents, and are not dedicated to answering incoming calls. They may be part time agents and perform other duties within the business. Prospects for informal call centers are more difficult to identify as the person answering the call may not be identified as an "agent" or a "telephone service representative". They could be the local expert in a particular department that takes calls from specific customers, or during specific times of the day, in addition to performing other duties. Typically, an informal call center involves using call center capabilities to provide an enhanced form of customer satisfaction or revenue achievement by making the best qualified persons available by phone.

Formal Call Center

A formal call center exists when a company dedicates several people to answer similar kinds of telephone calls. The individuals or agents within the formal call center specialize in answering incoming calls and concentrate on that activity. The incoming calls are managed and distributed to the agents through an ACD system.

CTI, especially screen pops, is invaluable to call center agents. With the introduction of Norstar TSP 2.1, screen pops can be made available to all agents with only one CTA device (acting as a server). This delivers a cost effective solution to the call center, as well as enhanced productivity for the agents.

Desktop CTI Benefits to Customers

The CTI revolution has brought the benefits of computer-telephony integration to a wider range of users – from the call center to the individual desktop. There is a broad selection of competitively priced, shrink-wrapped solutions available. The implementation of these solutions is quicker, easier, and less costly than it has ever been.

There is also improved application interworking across hybrid networks, which means customers can now pick a single solution across an entire enterprise network.

Norstar's support of CTI offers several benefits to our customers:

- New Applications Solutions

- Customers can leverage the power of TAPI applications such as Personal Call Manager and Symposium Call Manager, along with other Nortel distributed Symposium Partner Program applications.
- Investment Protection
 - Nortel and Norstar will continue to support development of TAPI standards. Customers can be assured that their investments in TAPI will have long-term evolution commitments.
- Purchase Flexibility
 - Norstar's TSP software supports a large number of TAPI-compliant applications. Productivity is maximized as more vendors incorporate TAPI functions in their applications.
- Cost Effective CTI Solutions
 - Robust CTI solutions based on these standards can be implemented at a fraction of the cost of custom applications—redefining business for maximum profitability with the power of CTI.

Increasing the number of new communications applications, calling traffic and access to enhanced services like voice mail and ACD will continue to fuel growth in the CTI market.

Desktop CTI Benefits to End Users

Implementing desktop CTI solutions in a business today offers many benefits to both the knowledge worker and the formal or informal call center agent.

CTI can increase productivity

- Screen pop solutions, utilizing CLID information, save time on the phone by retrieving valuable client information before answering the call,
- Contact management applications manage large amounts of client information and make it available instantly,
- Call control capabilities enable telephony features such as dialing, conference calling and transferring to be integrated into PC applications, reducing time and complexity.

CTI may reduce costs/increase revenues

- Less time on the phone translates into reduced 1-800 charges and more time spent with potential new customers or selling additional products and services to existing customers.
- Maximize investment in applications such as contact management programs by integrating telephony capabilities into programs that users already know how to use, and reduce training costs as a result.
- Implement CTI solutions in a client/server configuration, reducing system administration and maintenance costs.

- Many off-the-shelf TAPI compliant applications already exist or are already being used, minimizing the need for custom development costs and making “plug and play” software applications a reality. Most of these applications can be easily modified or adjusted, usually by the end-user themselves, to suit the needs of a particular business.

CTI can enhance customer service

- Greeting customers by name and knowing the details of their history enhances the personal relationship and facilitates satisfying their needs faster and more efficiently. Customers don't have to waste time repeating the same information every time they call.
- Managing telephony features through a simple drag and drop PC interface means never again having to say “I'll transfer you, but if I lose you, here is the number.”
- Whatever the industry, applications are available to make that customer feel special and that translates into enhanced customer satisfaction and increased loyalty.
- The Norstar passes CLID along with the caller during the entire duration of that call, and avoids the customer having to repeat their request if they are transferred elsewhere in the business.

The Norstar Personal Productivity Suite

The Personal Productivity Suite CD-ROM contains all of the Norstar Desktop CTI applications and documentation, the TAPI Service Provider 2.1, the drivers required for installation of the CTA devices and product demonstrations of Norstar and Symposium Partner Program CTI applications.

A variety of product demos and short presentations have been included to provide further information on Nortel Symposium products, Norstar products, and Symposium Partner Program TAPI applications.

The Personal Productivity Suite also includes a copy of the Microsoft TAPI 2.1 upgrade for the convenience of the Norstar customers that require it.

As its name suggests, it is the full suite of Norstar Personal Productivity applications you need to CTI-enable your desktop PC. Like many software developers, Norstar is introducing its desktop CTI applications as a suite, with additions and enhancements to be added to the suite as they become available.

Personal Productivity Suite main menu



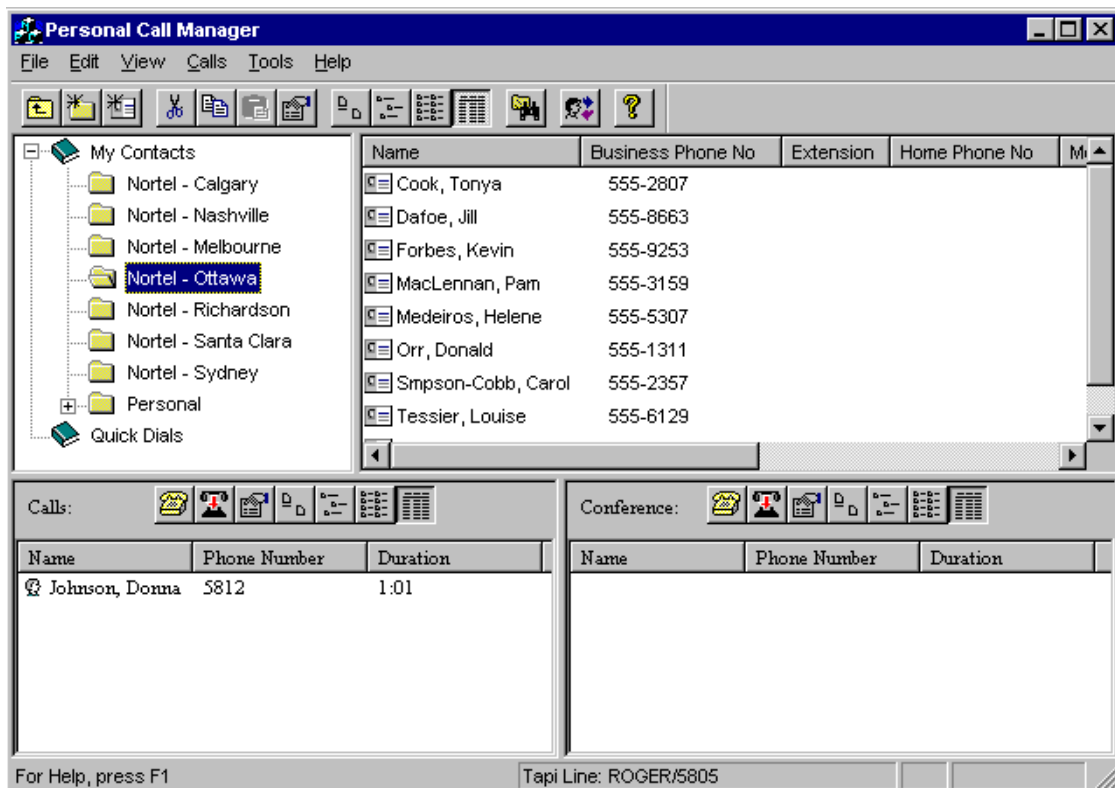
Personal Call Manager

Norstar Personal Call Manager (PCM) is an award winning TAPI-based telephony application designed for use on the Windows® 95/98/NT operating system. PCM brings much of the feature rich Norstar user interface to the Windows 95/98/NT desktop computer. With PCM, you can access an internal data base directory, double-click on a name to dial, conference or transfer calls; all with the ease of a mouse, eliminating the guess work and perceived frustration of using advanced telephone features.

Norstar Personal Call Manager 1.2 has been updated to operate with Windows 95/98 and Windows NT 4.0, as well as provide some new feature enhancements.

Personal Call Manager 1.2, included on the Norstar Personal Productivity Suite, is optimized to work with the Norstar TSP and fully integrates with the Norstar system.

PCM has two main models of operation: operation from the Windows task tray and operation from the main application window. The most common telephony tasks such as dial, hang-up, transfer and conference can be performed from the task tray icon. As well, access to the last callers/called list and quick dials is available from the icon. For more complex telephony operations as well as access to the personal address book, a main application window is provided. The look-and-feel of this window follows the Windows 95 style guidelines.



Norstar Address Book

The Address Book is the portion of Personal Call Manager 1.2 where you store telephone numbers and addresses of the people and businesses you deal with. Each entry in the Address Book is called a contact. A contact is normally the telephone number of a person or business, but can be any number you want to keep track of or store in PCM. Features of the address book include:

- Hierarchical tree view of contacts – the folders within the address book can be sorted and organized to meet your needs. The left side of the window shows the tree structure (ie. how folders are organized), and the right side of the window shows the contents of the highlighted folder. The contents can be viewed as large icons, small icons, list or detail. Files are organized into “Quick Dials” and “My Contacts”
- Extended information on each contact including business phone, home phone, fax and mobile phone
- Import/export text files
- Sound file storage in contact record (for example, “Bob calling” to audibly alert the user of the caller’s identification)
- Storage of bit map images in contact window (for example, logos or pictures of contacts).

Features of Personal Call Manager

All features of PCM can be invoked using either a mouse or the keyboard. The primary benefit of the PC interface is that management of call is visual, and most easily handled by “drag and drop.” Common features include:

- **Dial** – You can make a call using task tray or Calls menu, the toolbar, the Address Book, or the Quick Dial list.
- **Answer/Hold/Unhold** – PCM notifies you of an incoming call, and of the CLID (if you subscribe to the service). The icon changes as the status of the call changes from active to held.
- **Multiple Calls** – PCM can control several calls at once, equal to the number of lines available on the Norstar set. All calls appear in the main window, although only one can be active at any time (with exception of a conference call, when two calls are active at once). When a second call is answered, the current call is automatically placed on hold.
- **Conference** – A conference call connects yourself and two others onto a single call. Two lines (minimum) are required to appear on the Norstar set. As with the Norstar set, a conference call placed on hold from PCM puts both of the callers on hold, enabling them only to speak with each other. Splitting a conference call (via the right mouse button), ends the conference, putting one caller on hold and keeping one caller active.
- **Transfer (blind and announced)** – Transferring a call to another Norstar set is as easy as a mouse click; calls can be transferred “blind” (without talking to the recipient of the call first), or “announced” (informing the recipient who is being transferred to them).
- **Call Forward** – The number to which your telephone is forwarded appears on the Status Bar. Call forwarding your telephone to an external telephone number is not supported when you are using the Norstar TSP.

- **Do Not Disturb (DND)** – The telephone will not ring, but the line indicator will flash. The “you have a new call” dialog box will still appear on your PC screen when your phone is on DND.
- **Calling Line Identification (CLID)** – Telephone numbers of incoming calls will be shown if you subscribe to a CLID service.
- **Call duration** – A running count of how many minutes the call has been connected appears next to the active call icon.
- **Last Callers/Call Log** – PCM keeps a call log of both inbound and outbound calls, showing who called/was called and the time the call was received/made. This is a useful feature to identify callers that might not have left a voice message.

Enhancements of Personal Call Manager 1.2

- **Duplicate contact records** – When a duplicate contact record is being entered, the user will be notified.
- **One step call release** – If only one call is displayed on PCM and disconnect is requested, the call will be disconnected without requesting the user to select the appropriate call.
- **Printing capabilities** – The call log, a single contact, and the contents of a folder will all be print enabled.
- **Open contact for incoming calls** – A new option will be added to the Tools/Preferences menu to enable a contact record to automatically pop when an incoming call is answered.
- **Sort capability in Call Log** – Both the incoming and outgoing call log can be sorted by any of the fields (for example, name, phone number, date & time, or call duration).

Note: Note: The Norstar TSP 2.1 is compatible with Modular and Compact ICS 4.1. Personal Call Manager 1.0 and 1.2 are both compatible with Modular and Compact ICS 4.1, and do not need to be upgraded, as long as the TSP is upgraded to TSP 2.1.

System Requirements

The following minimum system requirements must be met by any computer wishing to run the PCM software:

- Windows[®] 95 or greater,
- CD-ROM or 3.5" drive (3.5" diskettes can be produced from the PCM CD-ROM),
- 8 MB RAM (16 MB recommended),
- 8 MB free disk space,
- 486 DX or greater processor,
- Norstar TAPI Service Provider (TSP) and supporting hardware.

Note: PCM requires a Windows[®] 95 or greater operating system. Norstar TSP 2.1 supports Windows 95, 98 and Windows NT 4.0. Norstar TSP 1.2 will support Windows 3.1 and 95, however the PCM is limited to Windows[®] 95 or greater environments only.

Norstar TAPI Service Provider (TSP) 2.1

The Norstar TAPI Service Provider 2.1 delivers significant functionality into the desktop CTI solutions arena. Norstar users can now implement cost effective solutions through either a direct connect configuration or a client/server configuration on an expanded range of Microsoft operating systems. This flexibility enables TAPI applications to be deployed throughout an organization in a cost effective and simple fashion.

Where does TAPI fit in?

TAPI (Telephony Application Programming Interface) is a product developed by Microsoft to provide a “standard” interface between the telephone switch and PC applications. Microsoft TAPI 2.1 provides standards for:

- Third-party call control,
- Full 32-bit implementation and support of 32-bit service providers,
- Support for Windows NT Workstation and Server,
- Call queuing.

Microsoft TAPI 2.1 specifically adds remote client support. This enables a user to use a TAPI application from a desktop PC and communicate with the TAPI Server via the LAN. There is no need to have a physical CTI device connected to that PC. It is required, however, that this PC is “registered” at the server as a remote client, and that the remote client option of Microsoft TAPI 2.1 is “turned on” at the PC.

The Norstar TAPI Service Provider (TSP) 2.1 is required to support applications using the TAPI 2.1 interface from Microsoft. TSP 2.1 supports both of the recent releases of the TAPI specification (TAPI 2.0, released in 1996, as well as TAPI 2.1, released in 1997).

It is important to recognize that TAPI is only an enabler that translates “requests” made by the TAPI application at the desktop.

TSP 2.1 Features

TSP 2.1 was developed to support these new features of TAPI 2.0 and 2.1. The following list of features are included in TSP 2.1:

- **Full 32-bit implementation** – Supports a broader range of applications. (Windows 3.1 was a 16 bit operating system; Windows 95/98/NT are 32 bit operating systems.)
- **Support of Windows NT 4.0 at the desktop** – Norstar CTI can now work at Windows 95/98 and Windows NT 4.0 servers and desktops (Note: the terminology used by Microsoft Windows NT for use at the desktop is “Workstation”. The two terms are used interchangeably in this chapter.)
- **Direct-connect CTI** – Norstar TSP 2.1 can be used in a configuration where the CTA device (CTA 100, CTA 160*i*, or CTA 200) is connected directly to a desktop PC and Norstar set, similar to the configuration used with TSP 1.2.

- **Server-connect CTI** – A single CTA device can be connected to the Norstar and to a Windows NT server, and any PC on the LAN can enjoy the benefits of CTI and TAPI applications through use of a TSP 2.1 seat license and TAPI 2.1's Remote Service Provider.

(Note: TAPI 2.1 delivers a remote service provider, which enables a remote PC to utilize TAPI commands from a CTA device connected to a service. TAPI 2.1 must be installed on the desktop and the remote service provider option must be enabled; a Norstar TSP seat license is installed and enabled at the Windows NT Server for each server-connected PC. Licenses are based on the number of DNs to be monitored rather than the number of PCs connected to the server.)

- **Full support for the entire CTA family** – Software drivers for the CTA 100, CTA 160*i*, and CTA 200 products are included within the TSP 2.1.
- **Auto detect of the CTA device** – TSP 2.1 will automatically detect which COM port the CTA device is connected to, eliminating the need to set the correct COM port during installation.
- **Drop support of Windows 3.1 and TelAdaptor/Norlink** – Applications running on Windows 3.1 must use TSP 1.2. The TeleAdaptor and Norlink have been replaced by the CTA 100, which is supported by TSP 2.1.

Note: TSP 1.2 is compatible with Norstar systems up to Modular ICS 3.0; there will be no further development on TSP 1.2 to support newer ICS software.

Norstar TSAPI has been manufacture discontinued. There is very little interest in TSAPI in the CTI market place at this time. Novell and Lucent have stopped investing in the product and have provided no roadmap for its long-term evolution. Nortel Networks Meridian has also discontinued support of TSAPI applications.

Via a Norstar CTA device (CTA 100, CTA 160*i*, CTA 200), Norstar TSP 2.1 allows TAPI applications to control the telephone set attached to the device (first party call control). Third party call control is also possible with TSP 2.1, in either a direct connect or server connect mode, on any of the clients or on the server itself.

CTI applications in a direct-connect mode are supported by Windows 95/98, and by all of the CTA devices.

In order to implement CTI in a server-connect mode, the CTA device must be supported by Windows NT 4.0, and the clients must have TAPI 2.1 installed. In addition, each desktop must have the remote access component of TAPI 2.1 "turned on".

TAPI Application Examples

Using a Norstar Computer Telephony Adapter to connect the PC to the Norstar, Norstar customers can now enjoy the many benefits offered by CTI. The Norstar CTA 100, CTA 160i, and CTA 200 can provide a wide array of business solutions that can fit into many existing LAN, client/server or stand alone PC environments.

The Microsoft standard for the desktop environment is the Telephony Application Programming Interface (TAPI). TAPI allows a Windows application to operate on many different switch platforms with little or no modification. In order to support TAPI, Nortel is providing the TAPI Service Provider (TSP) drivers for the Norstar. The TSP is a software layer that resides between the TAPI application and the Norstar system. This TSP adds new value to the Norstar by enabling the operation of Windows[®] telephony applications.

A TAPI application such as a “Personal Call Manager” runs on the users desktop computer (TAPI compatible Windows environments), drawing on and issuing telephony commands from that position.

Installation is relatively simple and can be completed by individuals familiar with Windows applications.

Note: Norstar TAPI previously used the TelAdaptor and the PCIB-TAPI card. Now TAPI uses products from the Computer Telephony Adapter family to connect to Norstar.

The TSP is packaged with the Norstar Personal Productivity Suite.

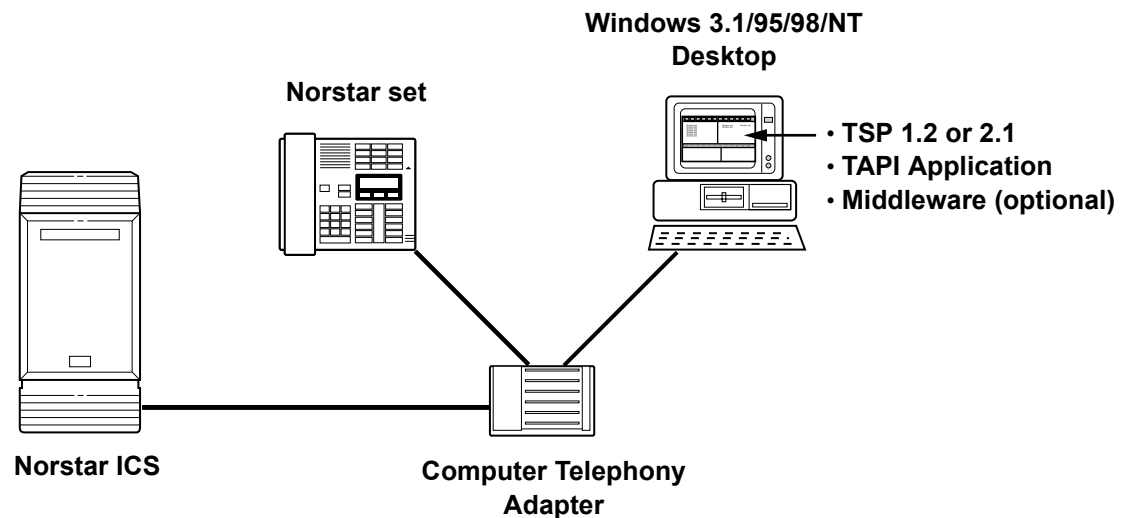
The following illustrations summarize several TAPI implementations that utilize the Norstar TAPI Service Provider and the CTA connectivity devices on a Windows 3.1 or Windows 95/98/NT desktop PC.

Direct Connect

The following illustration shows an individual desktop productivity solution utilizing Personal Call Manager or any one of a growing number of Nortel and other off-the-shelf TAPI applications. In this configuration, the individual user has full control and administration of the application.

Typical customers would include any knowledge worker with a PC and Norstar telephone on their desktop who wants to better manage their telephone contacts and features or any customer that is currently using an off-the-shelf TAPI compliant application.

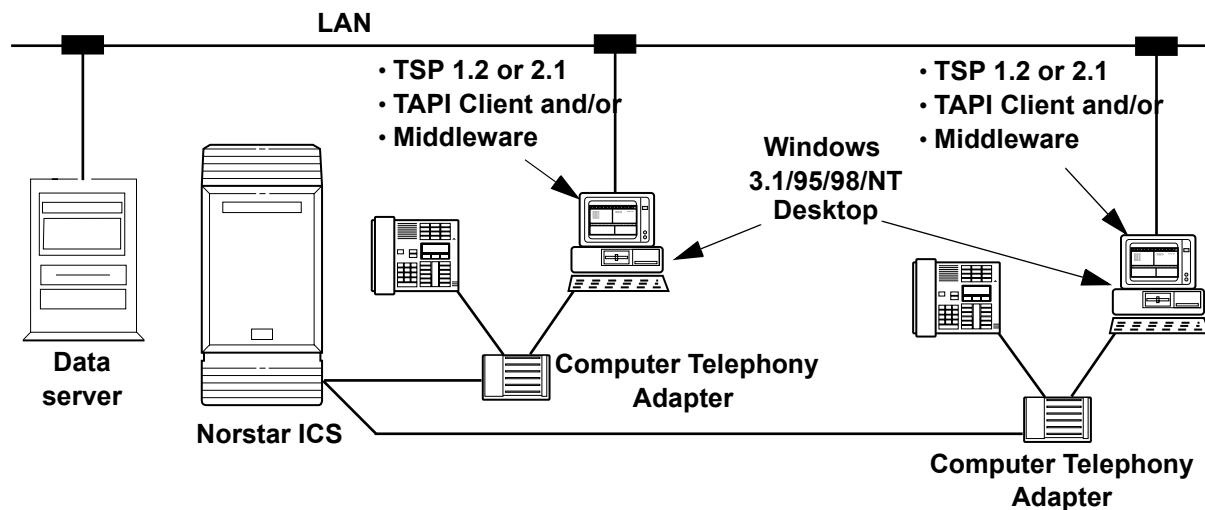
Direct connect means that the desktop PC and the Norstar set are directly connected to one another via a CTA device. This CTA device can be the CTA 100 or CTA 200, which are external boxes sitting on the desktop, or it could be a CTA 160*i*, which is an internal card installed in the PCI slot on the desktop PC.



Direct Connect in a LAN Environment

PC users that already have LAN access to information on a database can enhance their productivity by using CTI. For example, if an insurance company has client information stored on a database, adding a CTA in direct connect mode and middleware (optional) will enable the employee to receive screen pops of the client information based on incoming CLID.

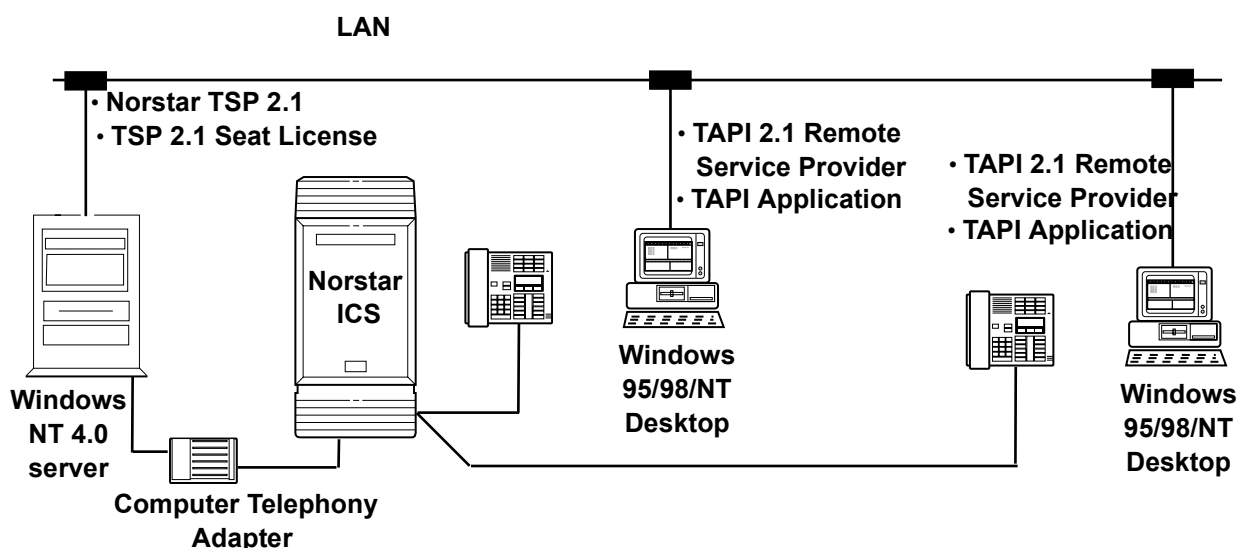
Middleware software is a layer of software installed on the desktop PC that uses incoming CLID to identify the appropriate client information and “point” to that file and invoke a screen pop at the desktop PC. There are a variety of readily available middleware applications such as Symposium Partner Program’s Revolution Rapport. The specific middleware used will vary depending upon the database being accessed; assistance can be provided by the Norstar Information Bureau.



Server Connect in a LAN Environment

In the server-connect model, there is one CTA device that is connected to a Windows NT 4.0 Server, and a logical relationship between the other Norstar telesets and the user. TSP 2.1 is installed on the Windows NT 4.0 server and the appropriate number of seat licenses are installed. (Licenses are packaged in increments of 5, 10, 25 and unlimited.)

During the installation of the seat licences, a table that identifies which user (person) is associated with which Norstar teleset is completed. This user can then log onto the LAN from any PC (using his user ID and password), and control the functions of his phone. This is an example of third-party call control. Each desktop PC must have the TAPI 2.1 Remote Service Provider "turned on".



Norstar Computer Telephony Adapters

The Norstar Computer Telephony Adapter (CTA) products are positioned as a comprehensive and simple method of installing industry standard TAPI connectivity on the Norstar system. The product family includes an upgrading capability and supports both basic and more advanced customer applications.

All CTA products come equipped with the Norstar Personal Productivity Suite, which includes TSP 2.1 and Norstar Personal Call Manager software application.

The CTA's primary purpose is to connect the computer to the phone. In short, these connectivity devices are the actual hardware devices that sit between the computer and the phone. The TSP software is loaded directly on the computer to complete the TAPI integration. PCM provides the screen-based telephony application that enables the end user to activate certain features of Norstar, using the graphical user interface and the mouse of the Windows[®] 95/98/NT PC.

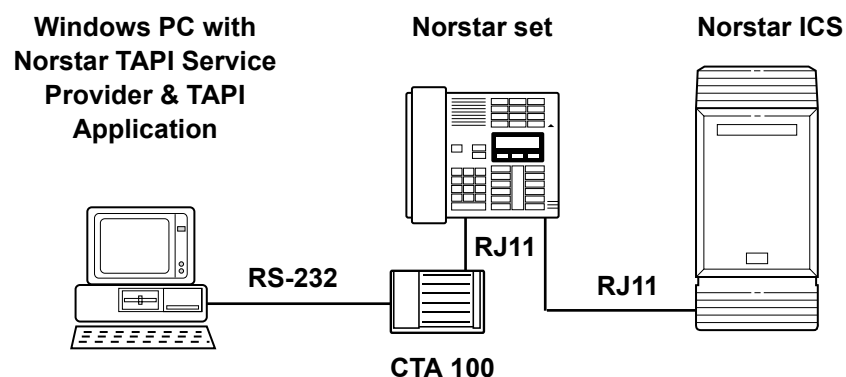
Note: All CTA devices listed below can also support Norstar ACCESS applications.

CTA 100

The CTA 100 is an easily installed TAPI connectivity device that provides TAPI connectivity via an RS-232 serial port. The CTA 100 also supports Norstar ACCESS applications.

The CTA 100 connects the 7000 series Norstar telephone to a Windows[®] PC via a RS-232 serial port. This set up provides D-channel connectivity, which is required to support a wide selection of TAPI applications such as Personal Call Manager, Symposium, Symposium Partners and Business Affiliates solutions. It is a physical hardware device, located at a specific desktop, where a Windows[®] based PC is linked to a Norstar set or at a Windows NT server. The CTA 100 is recommended for any CTI user who wants call control and support of industry standard TAPI applications.

The following illustration shows the direct connection of CTA 100 to a Norstar ICS and a Norstar set. The CTA 100 is connected to a local PC through an RS-232 connection. The RS-232 connection provides serial connectivity to the local PC via a 9-pin connector.



Since the CTA 100 provides TAPI connectivity, Norstar customers will be able to enhance the communication value of their Norstar system by using a wide variety of Nortel or third party applications. This product is well suited to customers looking to translate the benefits of CTI to their businesses by increasing the rate of CTI deployment on the Norstar system. This device is also the ideal product to stimulate a customer trial of desktop CTI. For example, a customer already using a TAPI compliant application or contact manager can enable screen based dialing and screen pops simply by installing a CTA 100.

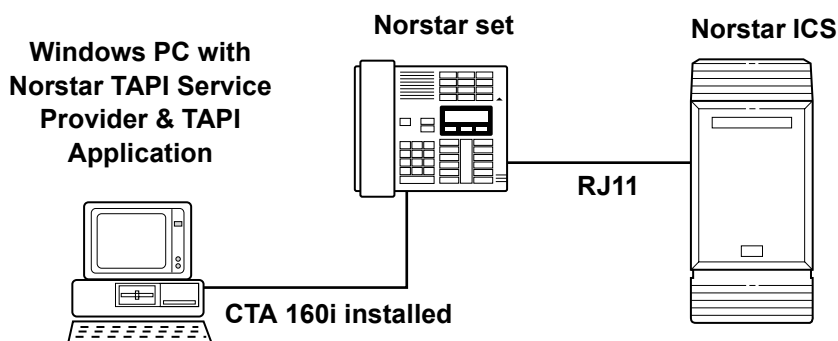
The CTA 100 package includes:

- CTA 100 device,
- Norstar Personal Productivity Suite,
- Power supply and all necessary cables.

CTA 160i

The CTA 160i provides a direct interface linking the desktop PC to the Norstar system and telephone set by insertion into an industry standard PCI slot in the PC. The CTA 160i automatically determines correct settings, eliminating the need to set dip switches. You should use the CTA 160i if a RS-232 or USB port on a PC is unavailable. The CTA 160i performs the same functions as the CTA 100.

The CTA 160i is an excellent alternative for customers who prefer the aesthetics of an internal solution and for anyone that does not have an available serial or USB port on their PC.



The CTA 160i package includes:

- CTA 160i device,
- Norstar Personal Productivity Suite,
- all necessary cables.

CTA 200

The Computer Telephony Adapter 200 is an external connectivity device that addresses the needs of the advanced CTI user. The CTA 200 delivers both RS-232 and USB (Universal Serial Bus) connectivity with flash memory for a new level of functionality and

upgradeability. The CTA 200 is recommended for “Advanced CTI users” (that is, those customers attracted to the future application potentials). As with all of Norstar's desktop CTI peripherals, CTA 200 is bundled with the Personal Productivity Suite.

Please note that use of the CTA 200 in conjunction with a USB hub requires use of Windows 98 Second Edition operating system on the user's PC.

Norstar TAPI Components

Components for Norstar TAPI implementation are described in the following chart:

Component	Detail	Source
User's PC	Windows® PC: 386 with 4 MB RAM with VGA or greater. Windows® 3.1, 3.11 (Windows® for Work Groups), Windows® 95/98 or Windows® NT 4.0. Minimum hard drive processor and RAM requirements for individual TAPI applications may vary. Consult TAPI application user guides for specific requirements.	User supplied
Application	Application must be TAPI compliant. Runs on the user's desktop computer.	TAPI applications available from Nortel. (For example, Personal Call Manager.) Also available from 3rd party vendors or from Nortel's Symposium, Symposium Partners or Business Affiliates. See chart of TAPI applications later in this chapter.
Microsoft TAPI software	Allows a PC application to talk to a telephone system.	Built into Windows® 95/98 or Bundled with the TAPI applications Also available for Windows® 3.1 or Windows® 3.11.
Norstar TSP	Enabling software that allows the desired application to inter-operate with the Norstar. Installs on the user's desktop PC.	Purchased from Nortel, bundled with the Norstar Personal Productivity Suite. Installation is relatively simple and can be completed by individuals familiar with Windows® applications.
CTA 100	A small plastic module that provides the RS-232 serial interface linking the desktop PC to the Norstar system and the telset.	Bundled with the Norstar Personal Productivity Suite. Package includes all cables and the power supply.
CTA 160i	Card that provides a direct interface linking the desktop PC to the Norstar system and the telset. Fits into industry standard PCI slot of the PC.	Bundled with the Norstar Personal Productivity Suite. Package includes all cables. Does not require a power supply.
CTA 200	A small plastic module that provides RS-232 and USB connectivity linking the desktop PC to the Norstar system and the telset.	Bundled with the Norstar Personal Productivity Suite. Package includes all cables and the power supply.
Norstar Telephones	M7100, M7208, M7310, M7324	Purchased from Nortel.

Component	Detail	Source
Norstar Core Unit	Must be a North American model Norstar DR5 or above: Norstar 3X8, Compact 6X16 and Modular 8X24 DR5 Modular ICS R1/T1; XC-USA-1.0; XC-CDA-1.0 and higher Compact ICS 1.0 and higher	Purchased from Nortel.

When to use the CTA 100

- Simple installation - just plug in the cables and install the software,
- For server-connect CTI environment,
- Ideal for self-installation by the end user, no need to open the PC,
- Ideal for sales demos using portable laptop computers,
- Low risk of software conflicts since the CTA 100 uses COM1 or COM2 software interrupts, which are standard.

When to use the CTA 160i

- More secure installation, since it is not easily removed from the PC,
- Does not require additional AC power, since it draws power off the PC'S backplane,
- Has no footprint, that is, does not require space on the desktop.

When to use the CTA 200

- Simple installation - just plug in the cables and install the software,
- Ideal for self-installation by the end user, no need to open the PC,
- Offers choice of USB or RS-232 to connect to the PC,
- Ideal for sales demos using portable laptop computers.

The following matrix will help to select the optimal solution that is right for each end user.

	CTA 100	CTA 160i	CTA 200
Connectivity to PC	RS-232	PCI Bus	RS-232 or USB
TAPI support	Yes	Yes	Yes
Can be used in Server Connect Mode	Yes	Yes	Yes (with RS-232 connection)
Applications support	Basic	Basic	Advanced
Serial Port Required	Yes	No	No
External Power Supply	Yes	No	Yes

	CTA 100	CTA 160i	CTA 200 (USB)	CTA 200 (serial)
Direct Connect Mode				
Windows 95	Yes	Yes	No	Yes
Windows 98	Yes	Yes	Yes	Yes
Windows NT	Yes	Yes	No	Yes
For Client PCs in a Server Connect Mode (note: server must be Windows NT 4.0)				
Windows 95	Yes	Yes	No	Yes
Windows 98	Yes	Yes	Yes	Yes
Windows NT	Yes	Yes	No	Yes

TAPI Applications

A list of 50 common TAPI applications is provided in the following table. These TAPI applications are readily available and frequently in use. This table can be used as a reference tool to recognize customers that are candidates for CTI and require only the CTA device and TSP to enable desktop CTI. Specific details about any of the applications listed should be sourced from the vendor for non-Nortel marketed applications (Business Affiliate or other Applications categories).

Application	Company	Norstar compatible (as per vendor)	Microsoft Windows OS	Type of application	Trial version on web	For more info
Nortel Networks Applications *						
Personal Call Manager	Nortel	Y	95, 98, NT	Call Control/Contact Manager Software	N	www.nortel.com/norstar
Symposium Call Manager	Nortel	Y	3.1, 95	Call Control/Contact Manager Software	N	www.nortel.com/home/quick/
Fastcall	Nortel	Y	3.1, 95	Screen Pop Software	demo only	www.nortel.com/entprods/visit/f.html
Symposium Fastview & Fastview+	Nortel	N	3.1, 95	Call Centre Software	N	www.nortel.com/entprods/callcenter/
Symposium Agent	Nortel	N	95, NT	Call Centre Software	N	www.nortel.com/entprods/callcenter/

Application	Company	Norstar compatible (as per vendor)	Microsoft Windows OS	Type of application	Trial version on web	For more info
Symposium Multimedia Conferencing	Nortel	Y	3.1, 95	Multimedia Communication Software	demo only	www.nortel.com/home/quick/
Nortel Symposium Partner Applications *						
Amicus Attorney	Gavel & Gown Software Inc.	Y	3.1, 95	Lawyer Productivity Software	Y	www.amicus.ca
Intuition	Answersoft Inc.	N	95, NT 4.0	Screen Pop Software	N	www.answersoft.com
Multi-line Pop!	Algo Communications Corp.	Y	3.1, 95	Screen Pop Software	Y	www.algocomm.com
Personal Caller ID	Algo Communications Corp.	Y	3.1, 95	Screen Pop Software	Y	www.algocomm.com
CT Pro	Algo Communications Corp.	Y	3.1, 95	Call Control Software	Y	www.algocomm.com
Phonekits Professional Edition	Algo Communications Corp.	Y	3.1, 95	Call Control Software	Y	www.algocomm.com
Pop! Server	Algo Communications Corp.	Y	NT	Screen Pop Software	N	www.algocomm.com
Rapport for TAPI	Revolution Software	Y	95, 98, NT	Call Control Software	Y	www.revsoftware.com
Sixth Sense	Answersoft Inc.	N	95, NT 4.0	Call Centre Software	N	www.answersoft.com
SmartRoute	Answersoft Inc.	N	95, NT 4.0	Call Routing Software	N	www.answersoft.com
SoftPhone Agent	Answersoft Inc.	N	95, NT 4.0	Call Centre Software	N	www.answersoft.com

* contact Nortel for further information

Note: The following chart listing Business Affiliate and 3rd Party Vendor Applications is provided for convenience only and is not intended as a list of Nortel recommended applications.

Application	Company	Norstar compatible (as per vendor)	Microsoft Windows OS	Type of application	Trial version on web	For more info
Business Affiliate Applications **						
ACT!	Symantec	Y	3.1, 95, NT	Contact Manager/Personal Information Manager	Y	www.symantec.com
CentrePoint	Coresoft Technologies	Y	95, NT	Unified Messaging/Call Control	Y	www.coresoft.com
CT-Connect	Dialogic CT Division	Y	95, NT	Call Control/Call Centre Software	N	www.dialogic.com
Day-Timer Organizer 98	Day-Timer Concepts Inc.	Y	3.1, 95, NT	Contact Manager/Personal Information Manager	Y	www.daytimer.com
Distributed Call Centre	Teloquent Communications	Y	95, NT 4.0	Call Centre Software	N	www.teloquent.com
Intellect	Clearwave Communications	Y	3.1, 95, NT	Call Control/Screen Pop Software	Y	www.clearwave.com
Link	Page TeleComputing	N	3.1, 95, NT	Call Control Software	N	www.page-tel.com
Maptel	MapTel Systems	N	95, NT 4.0	Screen Pop/Location Software	N	www.maptel.com
PhoneLine	CCOM Information Systems	N	3.1, 95, NT	Call Control Software	N	www.ccom-infosys.com
PhoneLink	Telcom Automation	Y	3.1	Call Control Software	N	Users.aol.com/asktai/main.htm
PhoneMax	Active Voice	Y	3.1, 95, NT	Call Control Software	Y	www.activevoice.com
Phonetastic Pro	Callware Technologies	Y	3.1, 95	Call Control Software	N	www.callware.com
Router for TAPI	Revolution Software	Y	95, 98, NT	Call Routing Software	N	www.revsoftware.com
Star SMDR	StarMaker Systems	Y	3.1, 95, NT	Call Control Software	N	www.starmaker-systems.com
Super-scripting	Digisoft Computers	N	95, NT	Scripting Software	demo only	www.digtel.com
SupportMagic	Magic Solutions Inc.	N	3.1, 95, NT	Help Desk Support Software	N	www.magicsolutions.com
Telescript	Digisoft Computers	N	95, NT	Scripting Software	Y	www.digtel.com
TelAssist	Adv. Multi-point Conferencing Inc.	N	3.1, 95	Contact Manager/Personal Information Manager	Y	fox.nstrn.ca:80/-amc/cit.html
TeleMagic (requires call control application)	Q & I Computer Systems Inc.	Y	3.1, 95, NT	Contact Manager/Personal Information Manager	N	www.qisys.com
Other Applications (3rd Party Vendors) **						
Call Audit / Call Audit Voice	Mountain Systems		95, 98, NT 4.0	Unified Messaging/Screen Pop Software	Y	www.mtnsys.com
Commence	Commence Corp.		3.1, 95	Contact Manager/Personal Information Manager	N	www.commence.com
Goldmine (requires call control application)	Goldmine Software		95, NT	Contact Manager/Personal Information Manager	Y	www.goldminesw.com
Info Select	Micro Logic Corp.		95, NT	Contact Manager/Personal Information Manager	N	www.miclog.com
Janna Contact	Janna Systems Inc.		95, NT	Contact Manager/Personal Information Manager	Y	www.janna.com
Lotus Organizer	Lotus Development		95, NT 4.0	Contact Manager/Personal Information Manager	Y	www.lotus.com
Maximizer (requires call control application)	Multiactive Software		95, 98, NT 4.0	Contact Manager/Personal Information Manager	Y	www.maximizer.com
On-Schedule 97	Odyssey Computing		95, NT	Contact Manager/Personal Information Manager	N	www.odysseyinc.com
Outlook 98	Microsoft		95, NT 4.0	Contact Manager/Personal Information Manager	N	www.microsoft.com
PackRat Pro 6.1	Polaris Software		95, 98, NT 4.0	Contact Manager/Personal Information Manager	Y	www.polarissoftware.com
Phone Dialer	Microsoft		95, 98, NT	Dialer	N	www.microsoft.com

Application	Company	Norstar compatible (as per vendor)	Microsoft Windows OS	Type of application	Trial version on web	For more info
Schedule+	Microsoft		95, NT	Contact Manager/Personal Information Manager	N	www.microsoft.com
Sidekick 98	Starfish Software		95, 98, NT 4.0	Contact Manager/Personal Information Manager	N	www.starfish.com
Time & Chaos (requires call control application)	Isbister International		95, 98, NT 4.0	Contact Manager/Personal Information Manager	Y	www.isbister.com
TransCOM	COM2001		95	Unified Messaging/Call Control	N	www.com2001.com

** Contact vendor for further information.

Norstar PC Console Overview

The Norstar PC Console product provides the ability to attach one or more Windows® 95/98 and Windows NT PCs to a Norstar Integrated Communications System (ICS) for use by telephone system attendants. The program provides a graphical user interface for the easy handling of incoming call traffic and quick dispatch to the appropriate person or to Norstar voice messaging. PC Console runs with other Windows applications in a multi-tasking environment.

The Primary Attendant can be located wherever a Norstar telephone can be located. Additional Attendants can be located wherever a Norstar telephone and a Local Area Network (LAN) connection is available. Additional attendants for backup or overflow positions are installed through use of Attendant License upgrades. The upgrades are available in increments of one (1) or four (4), and are installed via software keycodes.

With Norstar PC Console you can:

- Answer up to 144 incoming lines,
- Recognize and label who is calling the organization (note that target lines names are not displayed on incoming calls),
- Access information about callers,
- Add or change caller records,
- Put numerous calls on hold,
- See busy-line status of all phones,
- View a directory of all extensions showing person and telephone status,
- Park calls and access paging,
- Transfer calls to voice mail (note that calls cannot be transferred to a guest mailbox - these calls can be transferred using the Norstar telephone),
- Direct calls to an extension and display caller name in the telephone LCD window, even if the called party is on the phone,
- Allow the called party to control the call using options available on the Norstar M7324, and M7310 telephones,
- Provide management reports of how incoming callers are treated.

PC Console 1.1 Overview

Norstar PC Console 1.1 was released in January 1999 to provide compatibility with Modular and Compact ICS 4.0. In addition, the following enhancements are included on PC Console Release 1.1:

- Compatibility with Windows 95/98/NT,
- Do Not Disturb icons (indicates when an employee's extension is set to DND),
- Call Forward icons (indicates when an employee has Call Forwarded to another extension),
- Hunt Group icons (the color of the regular phone icon will appear as blue if that extension is part of the hunt group).

PC Console 1.2 Overview

Norstar PC Console 1.2 was released in January 2000 to provide compatibility with the CTA 160*i* and CTA 200 devices.

Target Markets

The target market for the Norstar PC Console includes any new customer purchasing a Norstar Compact ICS or Modular ICS system, as well as, any customer already owning a Norstar Compact ICS or Modular ICS.

The predominant market for the Norstar PC Console are higher line size Norstar systems, or Norstar systems with high incoming call volumes. Another target market would be any customer who wants to utilize a dedicated front-desk primary answering position, either with or without a back-up answering position.

Norstar PC Console is an appropriate solution for customers that wish to:

- Utilize a live attendant to handle incoming calls,
- Provide better service to their callers,
- Let employees know who is calling,
- Avoid missing important calls,
- Increase attendant productivity,
- Let management know how callers are serviced.

PC Console Benefits to Customers

Companies of all kinds are striving to offer world class customer service, as well as understand the patterns of calls coming into a business in order to manage them appropriately. Additionally, many companies, in their attempt to offer a high level of customer service, believe that they will differentiate themselves by having a live attendant answer all calls. Norstar PC Console is a good fit for all of these business requirements.

Increased performance and employee productivity are also important to the small site business, and the GUI interface of the Norstar PC Console makes it very easy for an attendant to choose the necessary buttons and functions easily and quickly. The multi-tasking

capabilities of Norstar PC Console also helps maximize the productivity of the attendant that also needs to perform other functions.

Enhanced customer service

Even before the call is answered, the Norstar PC Console can provide caller information to the Attendant to assist in handling the call. For example, the GUI can inform the Attendant of the caller's telephone number, the type of trunk group that the call came in on, and the amount of time that the caller has been waiting. The telephone call can be answered professionally and more efficiently because of the advanced information provided to the Attendant.

The graphical user interface of the Norstar PC Console can provide an Attendant with further information of a type that is not normally available with hardware-based consoles. For example, for any particular incoming call, the Norstar PC Console provides the Attendant with the names of the employees that the particular caller most often calls, along with the status of each employee's telephone. The Attendant is able to see immediately whether the target station is busy, and if so, the Attendant can quickly advise the caller of alternative employees for the caller to be connected to.

When calls are transferred back to the Attendant – for example, in the case where the target station is not answered, or where the station user requests service from the Attendant – the Attendant can immediately be informed by Norstar PC Console as to the status of the situation.

Norstar PC Console can be configured to automatically transfer overflow calls to another Attendant when calls are coming in faster than the main Attendant can handle them. If the Attendant is on a lunch break, or otherwise unavailable to take calls, PC Console can direct all calls to a back-up attendant position. These are important and valuable features to the Norstar customer because they ensure that calls are not lost and that callers are not frustrated by delays or poor service.

Decreased operating costs

Norstar PC Console requires a Pentium-based PC running Windows 95 or higher. Because a proprietary monitor and computer hardware are not required to run Norstar PC Console, there is minimal additional equipment on the Attendant's desk and the customer realizes a lower entry cost to obtain a software-based Attendant Console product than with competitive products that require the purchase of a proprietary computer and keyboard.

Norstar PC Console also provides a multi-tenanting capability for multiple businesses using the same Norstar system.

Note: Norstar PC Console 1.2 does not provide the target line name on incoming calls.

Improved employee productivity

Because the Norstar PC Console only displays buttons that have to do with handling a particular call, the GUI interface appears to be less “cluttered” and “complicated-looking” than a typical Attendant Console. Since there are few buttons, it is easy for an Attendant to

quickly select those buttons or features that are necessary to handle any particular telephone call.

Norstar PC Console works in a multi-tasking environment; this means that the Attendant can be using their PC to do other tasks such as word processing, and then quickly switch to the Attendant program when a screen pop notifies them of an incoming call.

The Norstar PC Console not only increases the personal productivity of the attendant, but also of employees that receive calls. The Attendant can communicate with an employee's telephone set, even when the employee is busy on another call. For example, caller information can be sent to the 2-line LCD display window on the employee's phone. The employee then decides what to do with the call, and with the use of soft keys, control it accordingly. All of this could be done without the employee leaving or disrupting the call that they are currently on.

PC Console Configuration

The Norstar PC Console is flexible enough to allow a variety of different configurations and work styles. In the most basic setup, a single Attendant position could be assigned to handle all of the incoming calls.

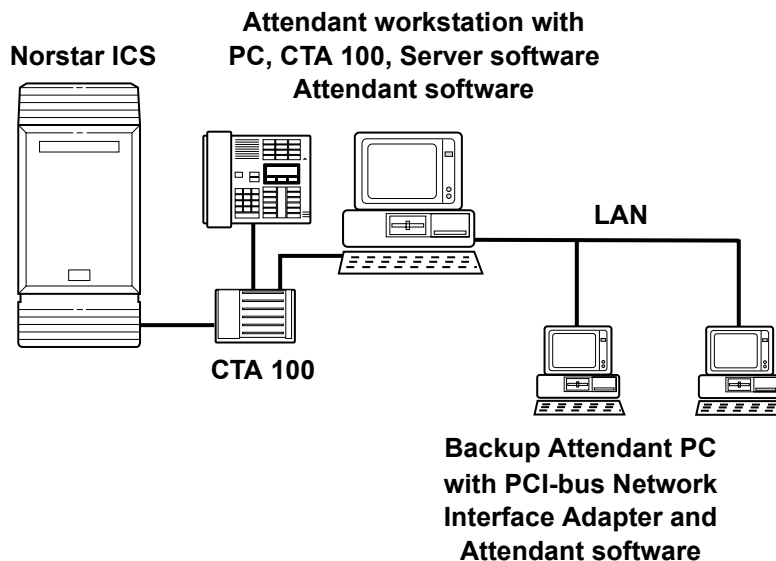
A second alternative is to assign a "back-up" or "overflow" Attendant, to assist the main Attendant. In the back-up Attendant situation, the main Attendant would have the capability to simply choose an option to cause all future incoming or Attendant-handled calls to be re-directed to the assigned back-up Attendant. This is extremely useful because the back-up Attendant would not have to physically relocate to the main Attendant's desk.

Norstar PC Console runs on a Pentium-based personal computer (PC), in conjunction with a Computer Telephony Adapter and PC Console software. The PC Console Server software can reside on the Attendant's PC, or on another PC within a LAN environment, providing the Attendant's PC is also within the LAN. The PC Console Attendant software is installed on each PC that is being used by an attendant.

PC Console can be used as either a stand-alone model, where one attendant handles all incoming calls, or a networked model where one or more PCs on a LAN provide backup attendant positions. The Attendant's PC connects to a Norstar Compact ICS or Modular ICS through a CTA 100, CTA 160*i*, or CTA 200.

Even when there are several attendants or back-up attendants, only one CTA device is required because the other PCs connect to the PC Console primary position via a PCI-bus Network Interface Adapter (10/100 MB Ethernet).

The following example shows PC Console installed in a system where there is one primary attendant, and a backup attendant via a LAN.



PC Console Architecture

The Norstar PC Console consists of three interrelated components:

- Server software,
- Attendant software,
- Reports software.

Server Software

The Server software only needs to be installed in one PC, and can be installed in the Attendant's PC or any PC on the LAN, providing the Attendant PC is connected to the LAN. In most cases, the Server software will be installed on the PC used by the primary attendant. Once installed, the Server software receives notification of all incoming calls, outgoing calls, and change of status of all telephones. The Server software can also request your Norstar ICS to transfer calls, place calls, park calls, and perform other Norstar telephone functions. The Server software can support multiple Attendant and Assistant positions.

Attendant Software

The Attendant software provides a PC-based graphical user interface to perform the same functions as a Norstar telephone when answering and handling incoming calls. In a LAN environment, the Attendant software can also be installed in multiple positions to provide additional or overflow coverage. Attendant software is installed in each PC that is being used

as an answering position by an attendant. Usually, the primary attendant will have both Server and Attendant software installed on their PC.

Reports Software

Reports software automatically collects information on incoming calls and tracks how callers are treated. This important information can be used to spot trends and provide answers to questions before they become problems. Reports can be requested from any Attendant or Assistant console and viewed on a PC screen, sent to an attached printer, or exported to other applications for further data manipulation. PC Console reports include:

- Calls to Employee Report - this report shows the types of calls (personal, customer, vendor, etc.) employees are receiving over a defined time period.
- Calls by Customer Report - shows how incoming customer calls were handled by employees: call taken by employee, call taken by assistant, call routed to voice mail or call routed to operator.
- Extension Directory Report - lists all employees that are in the Norstar PC Console database along with their department information.

Call Handling

The Attendant and Assistants have access to many features, all of which are executed through the Norstar PC Console main window. The primary features and the main window are described in detail below.

- Answer calls,
- Enter caller information,
- Find an extension,
- Transfer calls,
- Handle callbacks,
- Visual Call Announcing in the Norstar Telephone LCD Window,
- Call Control by the called party,
- A Caller Database,
- Automatic reporting on incoming calls.

Note: Visual Call Announce and Call Control are only available on Norstar M7324 and M7310 telephones.

Using the main window, the Attendant screen displays information about the incoming call such as caller name, company name and to whom the caller normally talks. The Attendant screen also shows a Company Directory with employee telephone status and personal status such as “away from office” or “away from desk”. The Attendant can also do a search for employees by name or department in the Company Directory. Once the employee’s extension is selected, the call can be transferred to their telephone, to their voice mailbox or to another number (such as home, cellular, pager).

Note: To transfer a call to a Guest Mailbox the Attendant must use the Feature key on their Norstar telephone.

Using a Windows 95/98/NT-compatible PC, the Attendant can type the caller's name and transfer the call to the called party. The caller's name only needs to be entered the first time. In subsequent calls, PC Console will "remember" the caller name and link it to the CLID.

The Attendant can also park the call automatically, page the called party and view parked calls to see details of all calls parked on the system. Or, the call can be processed according to "memo" instructions related to the caller. The current availability of employees is shown on the main window. For example, the notes field will identify if an employee is in a meeting or out of the office. When they are not covering calls, Attendants can be working on other tasks on their PC.

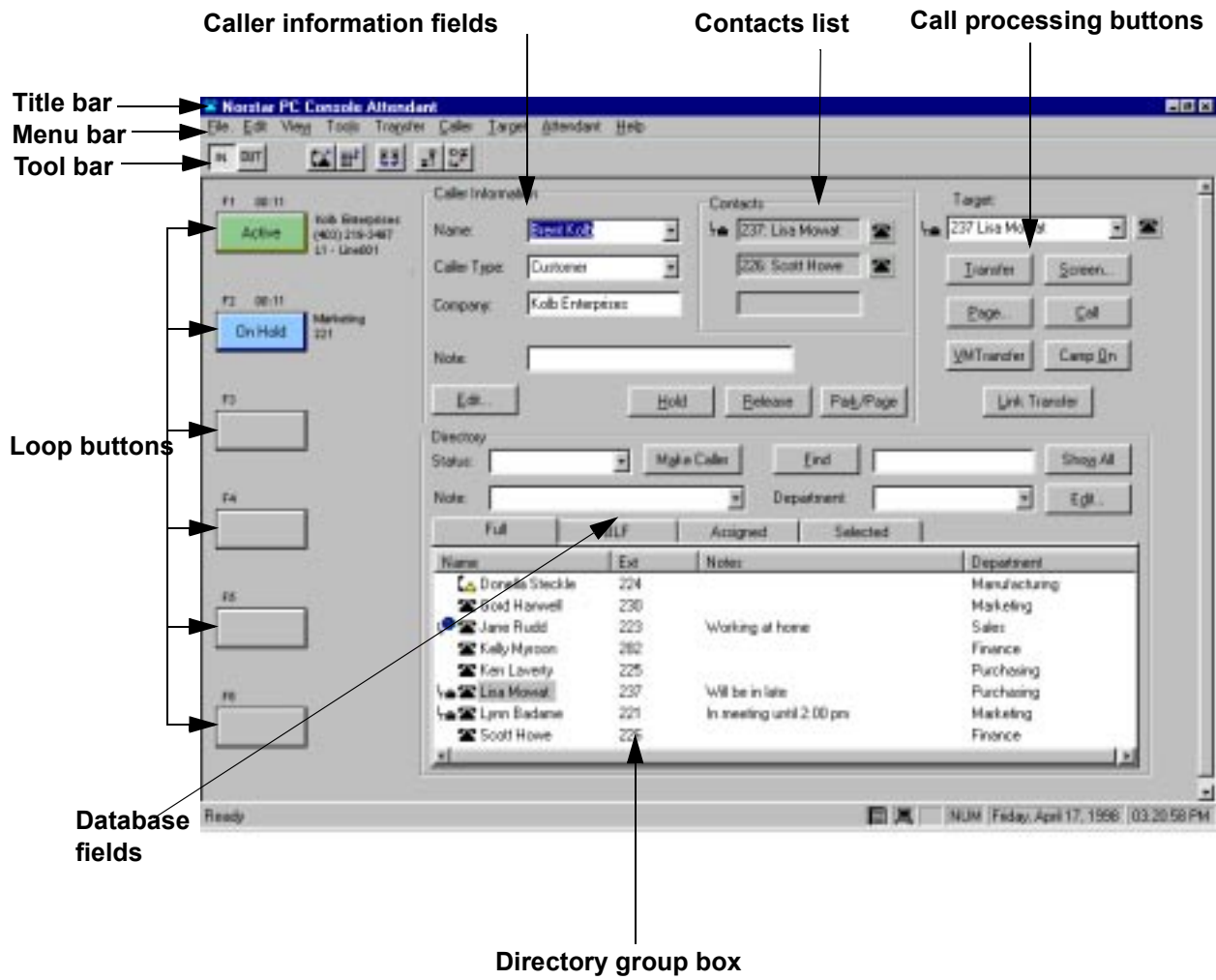
The Assistant

The Assistant performs the same functions as the Attendant when answering incoming calls. The Assistant is used to cover incoming calls for an individual, a work group, or a department.

Using a Windows 95/98/NT-compatible PC, The Assistant can be alerted by a Call Notification dialog box "popping" on their PC main window when a call is ringing the covered telephone set. This lets the Assistant pick up the ringing call if the called person does not answer. The assistant can easily add or remove telephone set(s) to be covered by selecting the extension(s) from the Assigned tab.

Components of the main window

The Norstar PC Console main window shows the following:

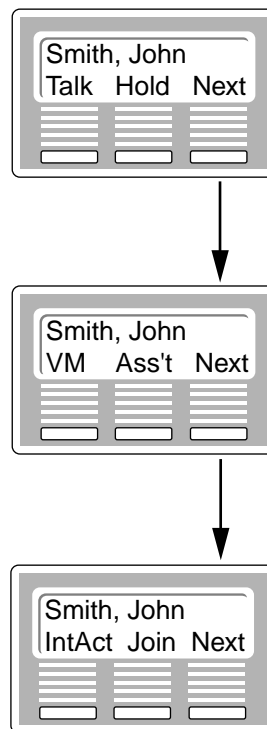


Visual Call Announce

Once the Attendant has routed the call to the extension, a low-level audible tone will alert the called person, even if they are on their phone. The caller's name will be displayed in their LCD window (M7324 and M7310 telephones only). In a busy office environment, visual call announce provides more privacy and less noise than paging.

Call Control

Norstar PC Console lets the called party determine how they want to handle incoming calls, even when they are already occupied on a call. Rather than having all calls automatically forwarded to voice mail when they are busy, employees now have the option of managing their calls using the 3 interactive softkeys below the LCD window of their Norstar M7324, or M7310 telephone.



By pressing an interactive softkey beneath the LCD Window of the Norstar M7324 or M7310 telephone, the following options are available:

- Talk to the caller by pressing the “Talk” softkey
- Ask the caller to hold by pressing the “Hold” softkey, which delivers a pre-set message to the attendant, who can advise the caller of the hold request,
- Automatically transfer the caller to voice mail by pressing “VM”,
- Send the caller to an assistant by pressing the “Ass’t” softkey, which delivers a pre-set message to the Attendant, who can speak to the caller and transfer them to the assistant,
- Send the call back to the attendant by pressing the “Interact” softkey, which delivers a pre-set message to the attendant informing them to speak to the caller,

- Join the caller with the current call by pressing the “Join” softkey.

If the called party is on the phone, the name of the new caller will overwrite any information that is in the LCD window. The new caller’s name is displayed in the LCD Window of the telephone for all calls transferred from the Norstar PC Console, but will disappear in approximately 20 seconds.

Caller Database

One of the benefits of the Norstar PC Console is that it can be installed as a passive system and can work in the background without affecting the way the ICS operates. Thus, a database can be automatically built on all incoming caller information.

The Norstar PC Console will automatically create a caller database by collecting the following data elements on incoming calls:

- Time of day and date,
- Norstar ICS line on which the call was received,
- Caller’s name (name and company from Caller ID or entered by using the PC’s keyboard),
- Caller’s telephone number (from Caller ID),
- Extension of the person called,
- Whether the call went to a voice mailbox or was referred to an assistant,
- Duration of the call (minutes and seconds).

Through Caller ID and the keyboard entry into the Caller Information fields of the Norstar PC Console, a database of caller records is automatically built so that future callers can be identified. This makes the Attendant’s job easier and more efficient since a name is entered only once rather than every call. Extension data (name and/or number) is automatically downloaded from the Norstar ICS to the Norstar PC Console database.

Using the Edit function in the Caller Information group box, information can be entered into the caller database through a simple, “fill-in-the-blanks,” Windows-oriented data entry form. The caller database provides an important tool for management to see how callers to their organization are being treated.

The caller and employee database is a Microsoft Access 97 database and can be opened and manipulated using any application capable of working with Microsoft Access 97 databases.

System Requirements

PC Console comes bundled with:

- Either the CTA 100, CTA 160i, CTA 200,
- Software on a CD-ROM,
- Cables,
- Power supply (with CTA 100, CTA 200),
- Installation instructions.

PC system requirements

Whether you are installing both the Server and the Attendant programs or just the Attendant program on a PC, the following PC hardware and software is required:

Minimum hardware requirements:

- Pentium based PC
- 32 MB of memory or greater
- 10 MB available disk space (total disk space required for either the stand-alone model or networked model)

Note: Additional disk space may be required for the Server database. The required size of the Server database depends on the call volume and the frequency of call record deletion.

- CD-ROM drive (for program installation). If you want to install Norstar PC Console on a PC without a CD-ROM drive, the program can be installed over a Local Area Network from a PC that has one.
- SVGA monitor with a minimum resolution of 800x600 and .28 dot pitch or smaller,
- Keyboard and mouse supported by Windows,
- Norstar Computer Telephony Adapter (CTA 100, CTA 160*i*, CTA 200),
- Printer supported by Windows (optional, for report printing),
- PCI-bus Network Interface Adapter, 10/100 MB Ethernet (only required for networked model).

Note: Excludes NE2000-Class cards.

Minimum software requirements:

- Windows[®] 95, Windows 98 or Windows NT 4.0 Operating System,
- Norstar PC Console Server program (included in Norstar PC Console product).

Norstar Compatibility

PC Console 1.1, 1.2 are compatible with the following:

Norstar Releases

- Compact ICS 1.0 and higher, Modular ICS XC 1.0, XL 1.0, Modular ICS 1.1 and higher.

Attendant Telephones, Visual Call Announce and Control

- M7310, M7324.

Monitored Telephones

- M7100, M7208, M7310, M7324 (including Key Lamp Module if present),
- Companion telephones,
- 2500 telephones.

Nortel Networks Developer Program

The Nortel Networks Developer Program is a global initiative that offers a broad range of companies the means to work together to provide a total solution to our mutual customers, creating a synergistic relationship between Nortel Networks and the development community by supporting and promoting integration efforts.

Program membership is composed of technology businesses that develop value-enhancing applications on Nortel Networks product platforms.

The Developer Program is a tiered program with two levels of differentiation: Open Developer and Developer Partner. This tiered structure provides developers with the ability to choose the level of relationship they wish to pursue with Nortel Networks.

Program Requirements

The Open Developer level is the base or entry-level position for companies developing applications and products on Nortel Networks platforms. To become an Open Developer, a company must submit an Open Level Developer Application form, sign a unilateral Non-Disclosure Agreement and be approved by Nortel Networks.

Companies that meet a stricter set of requirements for eligibility are rewarded with increased benefits as they move from Open Developer to Developer Partner. To become a Developer Partner, a company must submit a Developer Partner Application form, complete and pass Compatibility Testing on at least one primary product offering, be approved by Nortel Networks, pay an annual membership fee, and execute the Nortel Networks Developer Partner agreement.

For More Information:

Nortel Networks Developer Program
200 Athens Way, MS:601C
Nashville, TN 37228-1397

Fax: 615-734-5116

E-mail: dppna@nortelnetworks.com

Web site: www.nortelnetworks.com/prd/dpp/index/html

Norstar Mobility

Introduction to Nortel Companion

In this handbook, the name “Nortel Companion” refers to the Norstar Modular ICS, equipped with Modular ICS XC software and Companion Enterprise Mobility hardware components.

The current North American software-feature cartridges for Norstar Modular with Companion wireless functionality are:

CAN-Modular ICS XC 4.1.1: Offers expanded capability and Nortel Companion wireless functionality for Canadian market customers.

USA-Modular ICS XC 4.1.1: Offers expanded capability and Nortel Companion wireless functionality for U.S. market customers.

Overview

The proliferation and success of mobile communications devices both in the home (residential cordless) and in business (paging and cellular) is generating an increasing interest in private, in-building mobility solutions for business. Nortel Companion is the first key system designed to offer fully integrated wireless functionality within the workplace.

Although in-building mobility communications is a fairly new business, it is one of the fastest growing areas of telecommunications today. The overall telecommunications market in North America continues to have single-digit growth, whereas the in-building wireless communications market continues to grow by greater than 70% per year. More and more customers are realizing the value of investing in a mobility solution for their business needs. Nortel’s Companion product has been leading the way in North America, with number one market position in both U.S. and Canada for multicell Unlicensed Personal Communications solutions.

There is a definite demand for mobility on the job, and this need is addressed by Nortel Companion. This mobility option integrates with existing Norstar Modular ICS telephone systems, allowing continued use of desktop telephones, with the added ability to communicate anywhere within the building and surrounding grounds with portable telephones.

Product Alternatives

While both paging and cellular technology would appear to be mobility alternatives, both have drawbacks. Paging provides one-way, incoming communication over a wide area of coverage. The shortcoming is the delayed response: the user must find a telephone to call the

person that sent out the page. Cellular technology provides two-way, real time voice communication but has a high usage-based cost. Cellular voice quality is often inadequate for the office as calls cannot always be received in the building. Furthermore, with both cellular and paging, you also lose the advantage of integration with an existing system with features such as Calling Line Identification, Visual Message Waiting Indication, Conference, and Transfer.

Benefits of Nortel Companion

- **Cost effective**—Nortel Companion has no air time charges because it is a private mobility solution fully integrated with the Norstar telephone system. Nortel Companion can in effect also replace many devices in use in the workplace such as cellular telephones, mobile radio and pagers that have recurring monthly charges associated with them. The savings in eliminating some of these types of devices help to build the business case for Companion.
- **Efficient**—Users can respond immediately to both inter-office issues and customer requests.
- **Productivity**—Users can now take advantage of what would otherwise be “idle time” (for example, walking to and from meetings, waiting at fax machines, etc.) by following up on customer requests, responding to voice messages and answering inquiries for information, etc.
- **Customer Service**—With Companion, users will be accessible throughout the day even when they are away from their desk. Essentially, users will be able to take their desk telephone set with them throughout the day. This translates into faster customer service and response times.
- **Security**—Nortel Companion’s digital technology provides a higher degree of security than traditional analog cellular or cordless.
- **Ease of Expansion**—Just add portable phones and Base Stations as required.
- **Dedicated Radio Spectrum**—Companion operates on a dedicated radio spectrum that has been set aside for Unlicensed Personal Communications products. Companion will not receive interference from other radio devices nor will the Companion interfere with other radio technology.
- **Quality**—Nortel Companion is a high quality wireless communications tool. It has digital wireline quality voice transmission without interference and it offers all the benefits of complete integration with the Norstar communications system.

Why Choose Nortel Companion

When considering the wireless communications options, Nortel Companion stands out as the best choice for several reasons:

- **Nortel Quality**—Nortel has a strong history of high product quality, support excellence, technological leadership and innovation. Companion is one of the world’s most popular in-building wireless communications systems. With over 10,000 systems installed, Companion has a strong track record of reliability and quality.

- CT2PLUS compliance in Canada—Nortel Companion is currently the only wireless key system that complies with the Canadian CT2PLUS standard, which operates in the 944-952 MHz radio spectrum that has been dedicated to Personal Communications Services (PCS).
- 1.9 GHz Personal Communication Interface (PCI) compliance in the U.S.—Nortel Companion is currently the only key system that complies with the U.S. Etiquette rules, and operates in the radio spectrum that has been dedicated to Unlicensed Personal Communications Services (UPCS).
- Superior Service—Nortel distribution partners have the local presence and reputation to provide support that cannot be matched. Distributor support includes installation, training and maintenance.
- Unmatched Combination of Strengths—Two-way communication, digital security, no air time charges, standards compliance and integration with Norstar features truly make Nortel Companion stand out from competitive technologies.

Target Market

Nortel Companion delivers significant value in a variety of vertical markets:

- Retail—Nortel Companion reduces noise and distraction caused by overhead paging systems. Staff members can answer calls quickly and convert calls into sales while providing improved customer service. Companion has been an extremely successful solution in both retail department stores, as well as, other retail businesses such as car dealerships.
- Health care—Nortel Companion helps health care workers provide faster response and improved patient care. The majority of hospital staff are constantly on the go. A nurse's productivity and span of coverage is strengthened by having continuous access to incoming calls and emergency support. Doctors can be reached immediately when approval for treatment is needed, thereby accelerating the entire patient flow process and reducing the duration of patient stays. Patient flow is also improved by providing porters with portable handsets.
- Manufacturing—Nortel Companion can increase productivity and reduce downtime. With portable handsets equipment operators can easily communicate with supervisory personnel without holding up the production process. A production supervisor can consult with engineers, technical staff or management without having to leave the manufacturing floor. Rapid responses to changing customers needs in production processes are possible.
- Warehousing—Stockroom and warehouse personnel can use Nortel Companion to speed up locating merchandise and provide customer service while staying in touch with the customers and salespeople. They are also accessible to suppliers when coordinating merchandise shipments.
- Hotels— Staff members can use Nortel Companion to be easily located for prompt response to guest service requests. Event sponsors and organizers at conferences can rent portables to assist in co-ordination and to maintain contact with key customers.

To determine the individuals within a business who would benefit from Nortel Companion, look for the employees who consistently add high value to the organization. Also, look for

those employees who are mobile, either away from their workstations for extended durations or who have a large work area to cover. Individuals who interact with customers directly are ideal candidates for Nortel Companion. They are the key source of revenue for an organization and any means that improves their effectiveness is translated to the bottom line. Finally, review those individuals who are not mobile. Maybe they should be, and Nortel Companion is the means to make them more mobile and hence more productive employees.

Nortel Companion Customer Profile

Many companies can benefit from mobility in the workplace. The Nortel Companion customer wants a reliable mobility solution with features and options that enhance how they do business in their workplace.

A business that implements Nortel Companion is situating itself on the leading edge of mobile communications technology. The improved accessibility and communication network in the workplace results in enhanced quality of work and productivity. This can translate into greater revenues. Nortel Companion is for those companies that want the competitive edge in the marketplace.

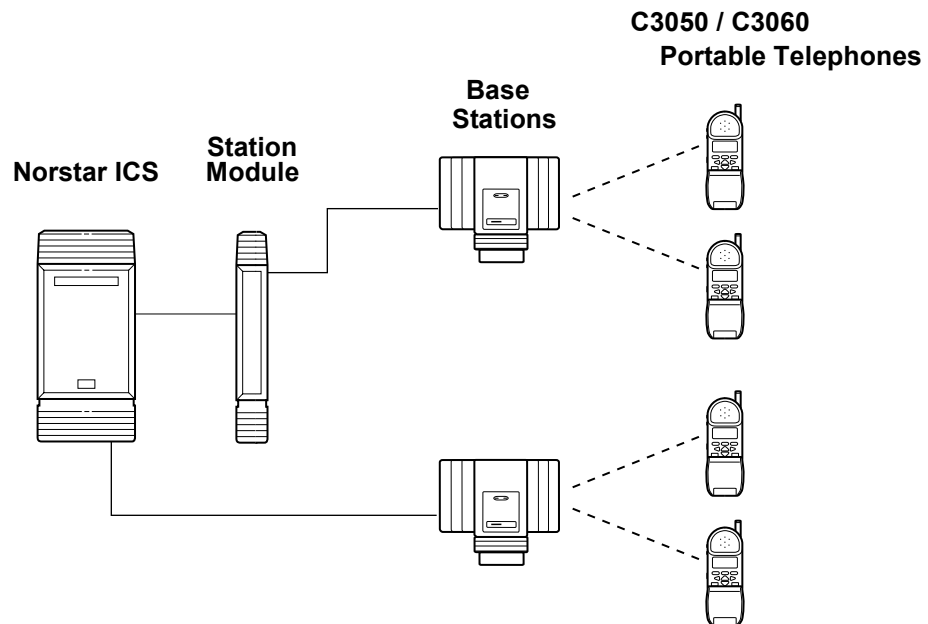
Architecture

With the integration of Companion mobility capabilities, the Norstar telephone system provides wireless functionality without losing the benefits of the wireline system. The system can be programmed so that users can publish one telephone number and receive all calls on both their desk set and their portable, allowing them to answer whichever is most convenient. Companion Portable Handsets will support Calling Line Identification (CLID), Calling Party Name Display and Visual Message Waiting Indication.

Nortel Companion supports:

- Integrated Nortel Companion wireless functionality,
- Norstar Modular ICS features, including expanded growth,
- Up to 192 Norstar M7000 series and/or Business Series Terminal telephone sets,
- Up to 32 Base Stations (on the core ICS or on Station Modules),
- Up to 32 cells,
- Up to 60 battery-powered C3050/C3060 portables (USA and Canada),
- In the US, C3050/C3060 portables are enabled on the system by the purchase of portable “credits”. Each portable requires one portable credit for activation on the system. In Canada, no portable “credits” are required.

Nortel Companion Mobility



Note: Depending on the configuration, Base Stations can connect to either the ICS core unit or to Station Modules.

Compatibility

Nortel Companion is compatible with the following:

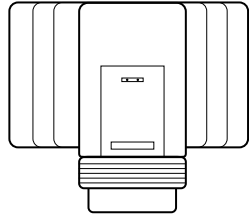
- Norstar M7000 series telephones and Companion C3020, C3050 and C3060 wireless portables.
- Norstar Business Series Terminals.
- Norstar Voice Mail RIs 1.3 and up.
- StarTalk FLASH / Norstar Flash Voice Mail RIs 1.44 and up.
- Norstar Manager 3.1+ and Norstar Remote Utilities. This enables on line capabilities, so that users can perform administration and maintenance functions locally or remotely.

Hardware

The hardware components that make up Nortel Companion are as follows:

- Base Stations, which provide up to 32 cells for total building coverage. They connect to the core ICS or Station Module.
- C3050/C3060 Portable Telephones and accessories.
- Remote Power Interconnect (RPI) Units, which provide remote power for Base Station support. There are two types; RPI-8, which supports up to 8 Base Stations, and RPI-16, which supports up to 16 Base Stations.

Companion Base Stations



Size: 20 cm x 32 cm x 5 cm
 8 in x 12.8 in x 2 in

Weight: 0.8 kg or 1.75 lb

Color: Dolphin Grey

- Base Stations can be mounted on walls or ceilings. They communicate using digital radio technology to transmit and receive signals between the Base Station, the portable handsets and the Norstar system.
- Base Stations provide the radio coverage for designated cell areas. The system supports a maximum of 32 cells. There are 1 to 4 Base Stations per cell depending on traffic. Base Stations forming a cell must be separated by at least 0.3m (1 ft) and must be within 1.5m (4.5 ft) of each other.
- The actual range of the Base Station is up to 200m (700 ft) in an open environment and between 20m (60 ft) and 70m (230 ft) in-building.
- Base Stations can be powered remotely using the centralized Remote Power Interconnect (RPI) or a 110v plug-in transformer that connects to a local AC power outlet. The RPIs are connected to the Station Module via a BIX Connection Block.
- Each Base Station is connected to Nortel Companion by a standard three or four pair cable. One pair is devoted to voice and signaling traffic, one of two pairs can be used for remote powering. It is recommended that two cables are installed for each Base Station.
- There are two antennae per radio channel. The Base Station samples the radio channel reception on the two antennae and continually switches to the antennae with the best reception.
- There are two LEDs visible on the front of each Base Station. These LEDs indicate the following:
 - A flashing red LED indicates system initialization following power-up,
 - A flashing red LED at any time after initialization indicates a Base Station malfunction or broken communications with Nortel Companion,
 - A continuous red LED indicates that both radios are currently in use,
 - A continuous green LED and no red LED indicates that the Base Station is functioning correctly.
- Base Stations are designed for indoor use, however, each Base Station provides a BDN connection for an external antenna. The antenna connects to the BDN using coaxial cable. There are three types of external antennas for use with the Companion:
 - Indoor directional,

- Indoor omni-directional,
 - Outdoor omni-directional.
- The external antenna should be a maximum of 10 meters (33 feet) from the Base Station. It is used for outdoor coverage of surrounding grounds, underground parking garages, stairwells or any indoor areas that are in general difficult to reach.

Companion C3060 Portable

The Companion C3060 is a new model of portable handset that includes several benefits:

Available features

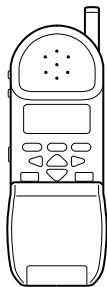


- Calling name & number ID,
- New robust, flapless design,
- Separate 15-entry directory for quick access to CTI/Host Switch Features,
- Addition of special volume settings for Loud Environments,
- Directory size expanded to 100 entries,
- Compatibility with C3050 chargers, batteries, headsets, and holsters,
- Password protected OA&M menu,
- Lockable handset configuration.

When using the softkey for programming on the Companion C3060 Portable, you no longer need to select a directory and you have access to three Active Call State Soft Keys.

C3050 Portable Telephone

Available features



- Calling name & number ID,
- Softkeys for simple access to features,
- Memory keys/function keys,
- Headset jack,
- Flap closed operation.

Enhancements

- Vibration alert for discrete situations,
- Single key access to voice mail.

- The Companion C3050 portable telephone is available on Nortel Companion in the US and in Canada.
- C3050 Portable Handsets have a battery life of 3.5 hours talk time and 35 hours continuous standby time with a rechargeable nickel cadmium battery pack and 5.3 hours talk time and 42 hours standby with high-capacity NiMH batteries.
- In the US, for each portable telephone a portable “credit” must be purchased in order to activate it on the system. Handset credits are not required in Canada.
- Nortel Companion portable handsets can either be assigned an independent telephone number or they can be twinned with a Norstar set.
- If the portable is twinned with a Norstar set, calls will ring on both the Norstar set and the portable telephone. The user can answer either one, whichever is more convenient.
- Portables support the specified Norstar set features using the LCD display.
- The portable telephone supports many of the basic features that reside on the Norstar set, such as call forward, call transfer, conferencing and visual message waiting indication. Enhanced features include Calling Line Identification (CLID) and Calling Party Name Display (CPND).

Accessories

- There are a number of accessories available for the Companion C3050/C3060 Portable Telephones. These include three different types of holsters for carrying the C3050/C3060 and two headset models for complete handsfree operation.

— Headsets:

Companion headsets plug into the Companion Portable Telephone to provide high-quality audio performance and handsfree use of the portable. With a headset, users can leave their portable telephone in their pocket or holster, freeing their hands to use a computer, write, or carry out some other task while they are on a call.

C3001 Headset: The C3001 ear-bud headset has no headband so it can be quickly put on or removed, without interfering with hair, hats or glasses. An attachable hook that fits over the ear is also included.

C3002 Headset: For extra stability and hold, the C3002 has a full headband and is suitable for those who wear headsets for extended periods of time, require a secure fit, work in a noisy environment, or wear a hearing aid.

— Holsters:

The C3050/C3060 Clip Style Holster is made from a durable black composite plastic. It has a rotating spring action belt clip that attaches firmly to the user’s belt or waist line.

The C3050/C3060 Leather Glove is a protective cover much like those available for use with cellular telephones. It has a detachable wrist and shoulder strap and a clear plastic cover that protects the keypad from dirt and moisture.

The C3050/C3060 Rugged Protector is designed to provide additional protection if the portable telephone is being used in a rugged environment.

- In addition to the Norstar business features the handset offers the following:
 - Fully digital performance to provide clear voice quality,
 - User-definable softkeys,
 - 2-line, 16-character display window,
 - Back-lit display window and keypad,
 - 50-name/number scrollable directory (can also be programmed for feature access),
 - Calling name and number identification,
 - Volume control (including muting),
 - Distinctive ringing,
 - Vibrate alert for discreet situations,
 - Portable telephone registration and de-registration,
 - Choice of 3 accessory holsters.

Companion Portable Battery Chargers

The current charger is replaced with two models, the single battery individual charger and the six battery group charger.

The new battery chargers provide several benefits:

- Individual battery charger for users with their own work area (single charging slot),
- Group battery charger for shared/shift environments (six charging slots - charges all batteries in one shift/7 hours),
- More reliable charging with high contact force and pressure, secure retention and increased battery diagnostics,
- Compatible with all C3050/C3060 battery packs.

The Companion battery charges come with smaller gold plated contact areas for greater pressure and charging reliability. The restrained battery packs are unaffected by vibrations. Redundant full charge detection prevents overcharging within the Companion battery chargers.

The Individual Companion Battery Charger has a spare battery holder on the back of the charger and requires approximately 1.5 hours charge time for a 600 mAH battery.

The Companion Group Charger has a first in first out charging order and it is table or wall mountable. One can also remove packs without affecting charging of other packs in the group charger.

Charge timing is as follows:

1 Pack	1.5 hours
2 Packs	2.5 hours
3 Packs	3.5 hours
4 Packs	4.5 hours
5 Packs	5.5 hours
6 Packs	6.5 hours

Companion CTI Support

Several enhancements have been made to Norstar Companion CTI support. Norstar now provides equivalent CTI functionality to other Companion products. These enhancements include:

- Session management,
- User interface improvements,
- Options for ringing portables.

Approval Process in the USA

PCS Overview

Personal Communications Services (PCS) are defined as a family of mobile or portable communications services for individual and business use. In the U.S., the Federal Communications Commission (FCC) has allocated different bands or spectrums to different types of transmission. Within the PCS spectrum allocation, 20 MHz was established for Unlicensed PCS (UPCS) devices, from 1910 to 1930 MHz. Nortel Companion operates in this newly dedicated 1.9Ghz spectrum for UPCS. Customers can operate these systems free of air time charges, without purchasing any radio spectrum of their own.

UTAM Zones

To ensure that UPCS systems are deployed in a coordinated and controlled environment, the FCC has designated UTAM (Unlicensed PCS Ad Hoc Committee for 2 Ghz Microwave Transition and Management) to handle the role of frequency management.

UTAM is a non-profit industry group responsible for overseeing the interference-free deployment of UPCS, as well as, the relocation of microwave links to other spectrum/transport systems.

UTAM has established two categories of counties to assist in deployment: Zone 1 and Zone 2.

- Zone 1 includes counties where deployment can be accomplished with no risk of interference to existing microwave links. Systems installed in Zone 1 counties must be reported to UTAM with information on site address, system type, and the number of handsets and base stations required.
- Zone 2 defines counties where deployment can be accomplished only after further evaluation of interference potential has been completed on a site-specific basis.

Software Key Codes and Credits—(USA Only)

Nortel Companion systems use Base Station Credits and Portable Credits to control system capacity and activation. Both types may be ordered in any increment.

While there is a charge for the Portable Credits, the Base Station Credits are free of charge.

The UTAM Activation Code activates Base Stations both at the time of initial installation and when a system is upgraded with additional Base Stations.

Likewise, a code is required to allow portable telephones to operate. The Portable Credit Code pre-defines the maximum number of portables that can be registered to the system. One credit is required for each portable. To support the maximum configuration no more than 60 portable credits can be purchased and entered.

Both the Portable Credit Code and the UTAM Activation Code contain three 8-digit parts for a total of 24 digits per code.

Nortel Companion Feature Functionality

Alternate Line Selection

- The link button provides an alternate intercom line.

Automatic Line Selection

- Opening the portable or pressing the line button will answer an incoming call.

Call Forward

- There will be no indication on the display that calls are being forwarded.

Call Park and Call Park Retrieve

- An active call can be placed on hold and assigned a retrieval code. The call can be retrieved from any Norstar telephone, including portable telephones, by entering the retrieval code.

Call Pick Up (Group and Directed)

- Companion portable users can “pick up” calls (that is, answer calls) ringing at other sets, portable or wireline, on the Norstar system.

Call Information (CLID, CPND)

- The name or DN of internal calls will be displayed on the LCD and, when the system is properly equipped to receive Calling Line Identification, external calling name or calling number will be delivered to the portable display.

Centrex/PBX Access Features

- Supports: link, timed release and pause.

Conference

- Press link key, dial number, press link again; conference call will be established.

Differentiated Ringing

- Fixed internal and external ring cadences.
- The tone or pitch may change according to the settings located on the portable.

Dial Tone Timeout

- The system will drop the link (full release) after 20 seconds of internal dial tone.

End-to-End Signaling

- Short tones.

External Line Access

- Via Line Pool access code.

Hold

- Although the link key can be used to temporarily hold a call (15 - 20 seconds), the recommended method for hold is to use the mute key.

Intercom

- Portable terminals will be assigned two intercom paths for the purpose of making internal and external calls (not affected by settings in administration programming).

Inter-Digit Dialing Timeout

- 15 seconds for calls or features, does not apply to dialing on external lines after the timeout.
- After the timeout users will hear reorder tone (subject to dial tone timeout).

Language Selection

- Receive LCD prompts in English, French or Spanish.

Multiple Line Access

- Supports multiple incoming CO lines.
- Supports multiple outgoing CO lines via line pools.

Paging via Portables

- Portable telephones can be used to make a page announcement.

Prime Line

- Prime line is always intercom.

Private Line

- Private line is supported.

Service Confirmation

- By opening the flap or pressing the line button and listening for dial tone, the portable user can determine if there is radio service in the area.

Set Names

- Incoming internal calls will display set names on portables.

Speed Dial

- C3050/C3060 system speed dial codes only (portable also has 50 name/number local directory).

Transfer

- Press link key, dial number, press release or close flap; call will be transferred.

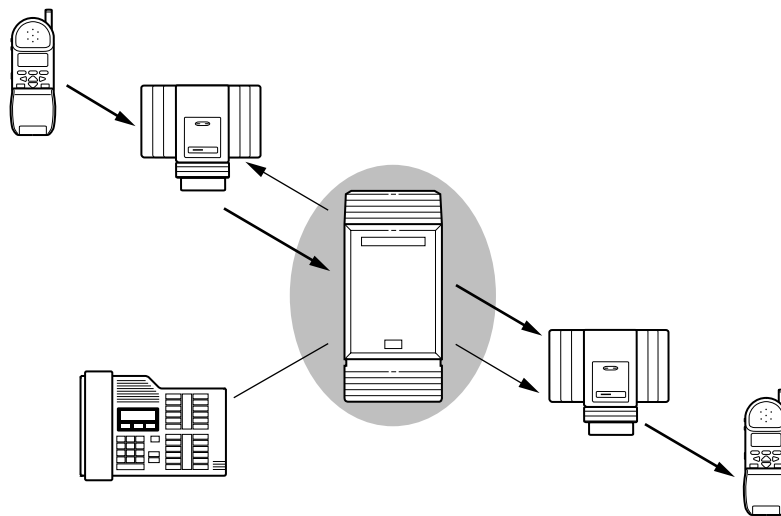
Trunk Answer

- Using the *800 the portable will answer trunk lines from any station.

Wireless Dial-by-Name

- The Dial-by-Name feature, resident on Norstar Voice Mail, can be accessed from the C3020, C3050, and C3060 Portable telephones.

Call Handling



How a Nortel Companion Call Works

- The portable making a call establishes a radio link with a nearby Base Station.
- The call goes from the Base Station to the Norstar system equipped with Nortel Companion software.
- The Norstar system switches the call just like any other call.
- The Nortel Companion software now locates the portable that is being called.
- The call is delivered to the nearest Base Station and the radio link between the Base Station and the portable telephone receiving the call is made.
- The call path is established and conversation proceeds.

Roaming

Roaming allows the portable telephone user to make calls, receive calls and access business features anywhere within a coverage area. If a portable is in a range of a free radio on a Base Station, Nortel Companion will determine the appropriate Base Station and select a free radio on the Base Station.

If the portable being called cannot be reached, the call can be routed to back-up answering, via the call forward or delayed ring transfer (DRT) capabilities of Norstar.

Absence of dial tone indicates no free radios on the Base Stations in the covered area. To get a free radio, the user can move to a different location and try again. (If the system is provisioned properly absence of dial tone should be an extremely rare occurrence).

Handoff

A portable telephone user should be able to maintain a call while moving within the coverage area. Handoff is when the call is handed from a radio in one cell to a radio in the neighboring cell.

For this to work effectively, Nortel Companion monitors the strength and quality of the signal received by the radio. When the user reaches the outer limits of one cell, Nortel Companion assigns the next, most suitable Base Station to continue the call.

On external calls, if the radio link is lost and cannot be re-established within 10 seconds, Nortel Companion will transfer the call to a prime set.

General Call Handling

- The C3050/C3060 portable can support a maximum of two concurrent calls:
 - One active/one held,
 - One active/one waiting,
 - One conference call.
- Call waiting—when active on a call, portable user will hear call-waiting tones if another call is incoming. User can press “Link” key to toggle between calls. If user does not want to be interrupted with call waiting tones, Call Forward Busy can be programmed in administration to route the second caller elsewhere. (voice mail, etc.)
 - Call Forward/Call Forward Busy applies,
 - Delay Ring Transfer (DRT) applies.

Using Nortel Companion Features

- The “Link” key allows transfer, conference, hold and switching between calls.

For example, to establish a conference call on the portable, press “Link”, dial the second number and press “Link” when answered.

- The “Line” key allows Norstar feature access.

To activate press “Line”, press “*” and enter the Norstar feature code.

To cancel press “Line”, press “*”, press “#” and enter the Norstar feature code.

Twinning

Twinning is the interaction between the wireline and wireless sets. Twinning allows the user to receive all incoming calls on both their portable and wireline sets. The call can be answered on whichever set is most convenient. The incoming call (internal or external) will cause alerting on both sets.

Twinning is set up using answer keys to assign portable handsets to their wireline twin. One set acts as the primary DN with the twinned set assigned by answer key.

If the call is answered at the wireline set, the portable set will display “Call Ended”. The portable will then go into an idle state. If the call is answered by the portable set, the appropriate indicator on the wireline set will be lit and the portable will display the line number or the set name that is connected.

Rules for Twin Alerting

Type of Call	Alert at Idle Twin
Internal or external call attempting to ring wireline set directly	Yes
Call redirected FROM wireline set due to call forward (any type)	No
Call redirected TO wireline set due to call forward (any type)	Yes
Park Call back or Transfer Call back to the wireline set	No
Call ringing at answer key on wireline set for another set (for example, extension 222)	Only if portable also has an answer DN for ext. 222
Call originating from a portable twinned to a wireline set	No (Call originates from the portable - so its not idle)
Second call attempting to ring wireline set when the portable is already on a call	Yes - call waiting tones
Second call attempting to ring wireline set when the portable is already alerting for a call	No - portable is busy at ringing
Call originating to a Private Line on the wireline set	Yes
Call transferred to wireline set from twinned portable	Yes
External call alerting but not ringing at wireline (due to appear only line appearance)	Yes
Internal or external call directed to wireline set by prime set call capture	Yes
Call directed to the wireline set by Service Modes ringing set	Yes
Call directed to the wireline set due to Overflow Call Routing	Yes
Priority or Voice call to wireline set	No

Call Handling—Voice Mail Interaction

When setting up voice mail for a user with a standalone portable telephone, the programming is as follows:

- Assign the mailbox to the DN of the portable,
- As with a wireline set, the Forward on Busy and Forward No Answer destinations are voice mail,
- The message indicator will appear on the portable,
- The following voice mail features can be used:
 - *980 - leave a message,
 - *981 - open the mailbox,
 - *985 - display voice mail DN,
 - *987 - interrupt.
- Portables cannot use mailbox transfer, which is F986.

Generally the user has both a wireline set and a portable. In this twinned scenario the programming is as follows:

- The wireline set and the portable telephone each have their own DN,
- The mailbox must be programmed to one set or the other.

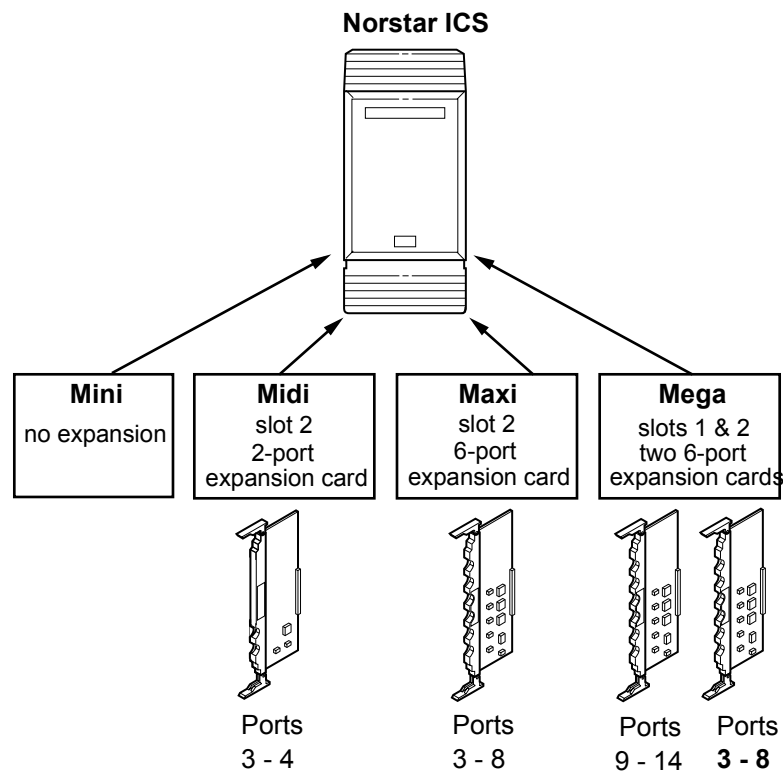
If the user wants visual message waiting indication on the portable telephone the following programming applies:

- Assign the mailbox to the portable telephone's DN,
- The portable telephone's DN must be the published number, that is, the prime number,
- Give the wireline (desk) set an Answer DN for the portable,
- Make the voice mail the Forward No Answer destination for the extension of the portable,
- Calls will ring at both the wireline and portable set,
- After the programmed number of rings, Forward No Answer will send the call to the mailbox,
- The portable will be able to use *987 to interrupt (although this feature will not be available on the wireline set),
- When the mailbox is assigned to the portable, the "Message For You" indication will not appear at the wireline set.

If the user wants visual message waiting indication on the wireline set the following programming applies:

- Assign the mailbox to the wireline set's DN,
- The wireline's DN must be the published number, that is, the prime number,
- Give the portable an Answer DN for the wireline set,
- Make the voice mail the Forward No Answer destination for the wireline set,
- Calls will ring at both the wireline and portable set,
- After the programmed number of rings, Forward No Answer will send the call to the mailbox,
- The wireline set will be able to use *987 to interrupt,
- When the mailbox is assigned to the wireline set, the Visual Message Indication will not appear at the portable.

Nortel Companion Expansion



The Nortel Companion supports four system expansion sizes: Mini, Midi, Maxi and Mega.

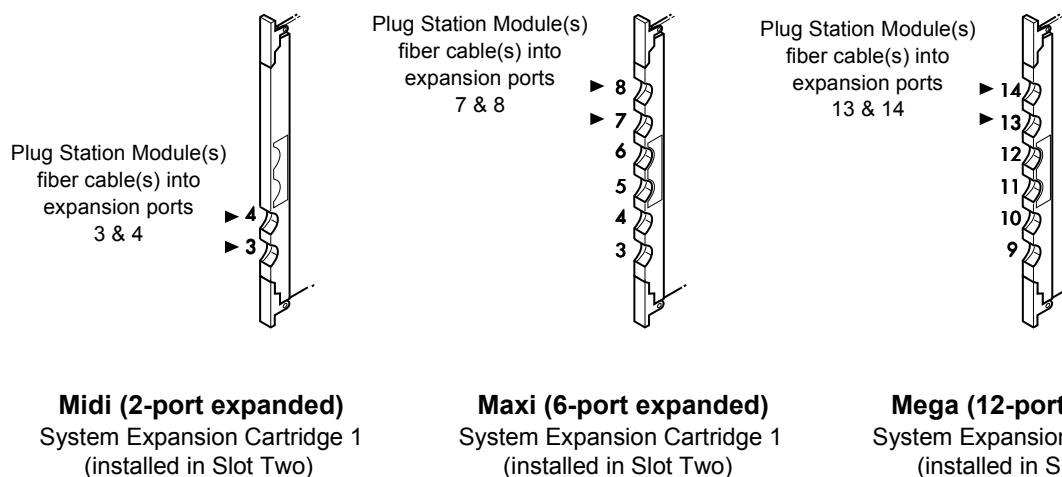
- **Mini**—involves no expansion. The Nortel Companion Base Stations work off the core Modular ICS platform, ports 1 and 2,
- **Midi**—2-port expansion. The 2-port expansion cartridge fits into slot 2. The cartridge provides expansion ports 3 and 4,
(Note: Expansion cartridges begin with port 3. This is because there are two DS-30 loops internally on the core Modular ICS unit; ports 1 and 2. Therefore, when expanding, the first expansion cartridge port is numbered 3 and the twelfth is numbered 14.)
- **Maxi**—6-port expansion. The 6-port expansion cartridge fits into slot 2. The cartridge provides expansion ports 3 through 8,
- **Mega**—12-port expansion. There are 3 configuration options with 12-port expansion:
 - Two 6-port Fiber Expansion Cartridges,
 - Two Combination Fiber 6-Port Services Cartridges. (Combination Cartridges support 6-port expansion and clocking services for T1 or ISDN.)
 - One 6-port Fiber Expansion Cartridge and one Combination Fiber 6-Port Services Cartridge.

The first expansion card (expansion ports 3 to 8) is designated to slot 2 on the ICS platform.

The second expansion card (expansion ports 9 to 14) is designated to slot 1 on the ICS platform.

Expansion Rules

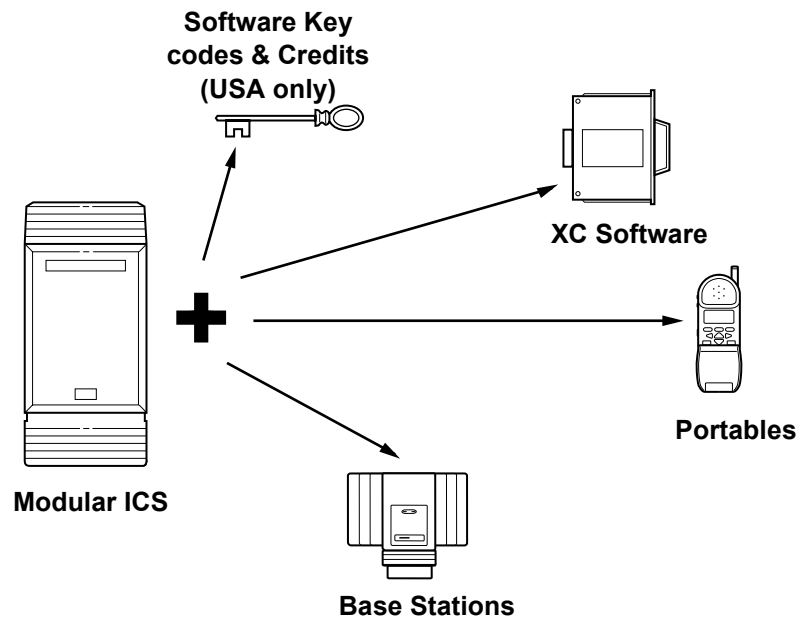
- Modular ICS Trunk Modules are restricted to the first six of the twelve expansion ports,
- Station Modules are restricted to the first ten of the twelve expansion ports,
- Companion Base Stations can be supported on the core ICS in non-expanded systems, or on the highest two expansion ports of an expanded system,
- On a two- or six-port expanded system, Station Modules that support Companion Base Stations can also support Norstar wireline sets,
- On a fully expanded twelve-port system, expansion ports eleven and twelve support wireless Base Stations only,
- On expanded systems, the following chart indicates the port assignment for Base Station configuration:



When Nortel Companion systems are expanded in size, wireless Base Stations and/or Station Modules must be physically relocated to the correct ports to be operational.

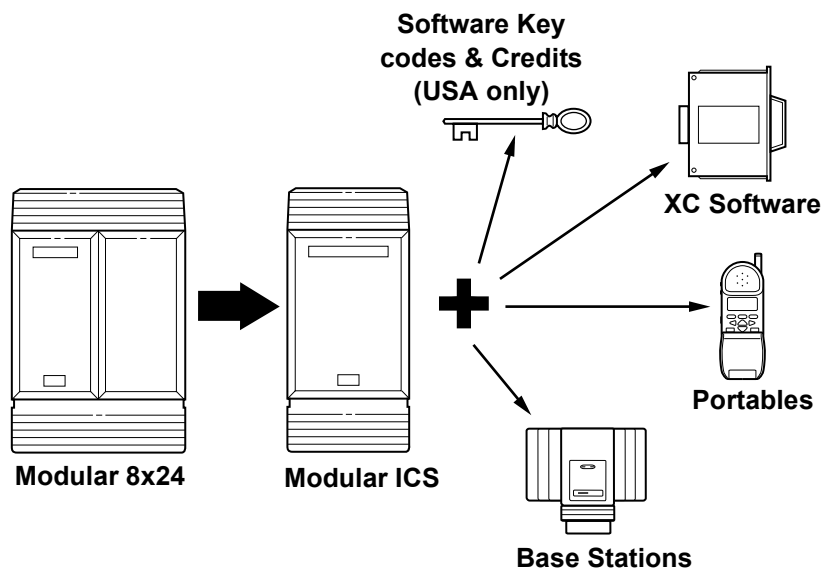
Upgrade Process

Norstar Modular ICS to Nortel Companion



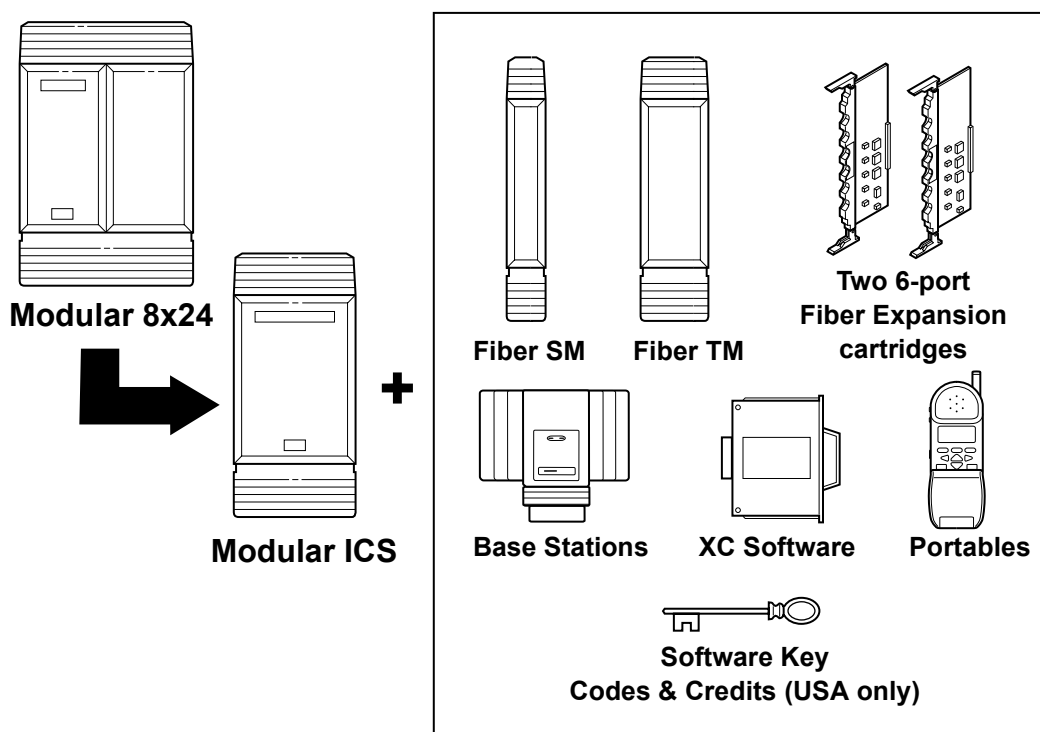
- The Nortel Companion wireless functionality is resident on the Modular ICS XC software. Therefore, the customer only purchases the software, software key codes and credits (USA only), Base Stations and C3050/C3060 Portable Telephones required.

Modular 8x24 to Nortel Companion (6-port)



- Nortel Companion software is not compatible with the Modular 8x24,
- To upgrade from a Modular 8x24 to Nortel Companion requires a new Modular ICS core unit,
- Once upgraded to Modular ICS, the customer requires XC software, software key codes and credits (USA only), Base Stations and Portable Telephones,
- Copper Expansion Cartridges and Copper Trunk and Station Modules must be replaced with fiber equipment.

Modular 8x24 to Nortel Companion (12-port)



- To upgrade from a Modular 8x24 to Nortel Companion with 12-port expandability requires a new Modular ICS core unit.
- The enhanced growth to twelve expansion ports is enabled through the use of fiber connectivity. As a result, Copper Expansion Cartridges and Copper Trunk and Station Modules must be replaced with fiber equipment.
- Once upgraded to Modular ICS, the customer requires XC software, software key codes and credits (USA only), two 6-port Expansion Cartridges (either two 6-port Fiber Expansion Cartridges or two Combination Fiber 6-Port Services Cartridges, or one of each depending on digital connectivity requirements), Fiber Station Modules, Fiber Trunk Modules, Base Stations and Portable Telephones.
- The investment in Norstar sets is protected. This generally constitutes 60% to 70% of investment in Norstar.

Administration and Maintenance

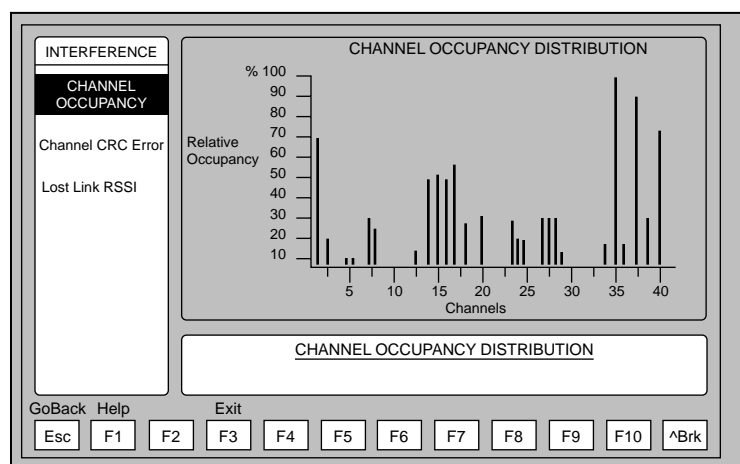
Administration

- Once integrated with Norstar, Companion administration can be done from any M7310 or M7324 set. The administration set is fully functional. These sets can make and receive calls in addition to performing administrative functions.
- The Nortel Companion Maintenance and Installation Guide provides details on Base Station maintenance and on which maintenance operations can be performed by the system administrator.
- Nortel Companion administration and programming can also be accomplished using Norstar Manager or Norstar Remote Utilities and a Remote Access Device (RAD). See Appendix B for details of releases.

Receiver Signal Strength Indicator (RSSI) Monitoring

- Any Companion Portable Telephone can be used as a test tool by using the portable telephone's RSSI measuring capability. This capability is detailed in the C3050/C3060 Registration Instructions documents.
- Receiver Signal Strength Indicator (RSSI) Monitoring is used to aid in Base Station positioning and troubleshooting. Monitoring can either be directed or undirected.
- Directed RSSI Monitoring enables system administrator to check the coverage provided by a specific Base Station. Each portable telephone displays RSSI measurements found on the Base Station/portable telephone link.
- Undirected RSSI Monitoring is used to detect gaps in radio transmission coverage.

Companion Diagnostic Software



- Companion Diagnostic Software (CDS) uses a Remote Access Device (RAD) and a 386 Personal Computer to run maintenance and diagnostic procedures remotely or locally.

- CDS can be used for many maintenance and diagnostic functions from checking system performance, to problem diagnosis, to measuring Base Station occupancy.
- The RAD is connected to a Station port on the Nortel Companion system.

Companion Deployment Tool

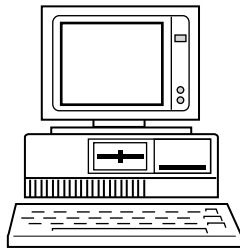
- Companion Deployment Tool (CDT) comprises a CDT Base Station, CDT Stand and CDT Battery Assembly.
- It is used in conjunction with a portable telephone to test the radio propagation characteristics of the site before installation of a Base Station. This activity is called the Site Deployment process.
- The Site Deployment process ensures proper placement of each Base Station for optimal performance and coverage.

Companion Applications Toolkit

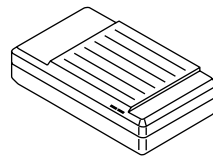
The Nortel Companion Applications Toolkit is a software developer's toolkit that delivers the ability to create integration between PC-based software applications and a Nortel Companion Mobility system. This is an open programming interface for value added developers to write custom software applications that interwork with Companion systems. It is the world's first wireless communications and CTI integrated solution toolkit to be delivered by any telecommunications equipment solutions provider.

One of the most popular types of applications proposed by customers is a type of database look up capability. In this type of application, a developer uses the Companion Applications Toolkit to build applications that allow Companion users access to critical database information no matter where they are on the premises.

Norstar Remote Administration



Personal Computer



Remote Access Device

Introduction

Norstar Manager was developed and introduced to the North American market in 1992 to provide an effective remote programming, administration, and maintenance tool for Norstar systems. Over the years, this product has evolved and changed to include new tools and enhancements. Today, this suite of remote programming and maintenance tools is known as Norstar Remote Utilities 8.1.

Note: Norstar Remote Utilities Release 8.1 supports Modular ICS Release 4.1.1.

All of Norstar's remote administration tools have been designed to enable channels and end users to provide superior service levels and cost effective support of their Norstar systems. Benefits include:

Benefits include:

- Reduction in customer site visits for service and maintenance,
- Faster handling of service requests,
- Centralization of technical expertise and system data,
- More effective and timely service delivery.

All versions of the Norstar Manager and Norstar Remote Utilities software use a PC to perform much of the programming required for new installations, adds, moves, changes and maintenance support on Norstar systems. For example, the following system changes can be completed from a remote site:

- Change the features programmed on the buttons of individual telephone sets,
- Update the system speed dial list,

- Backup system data,
- Restore system programming from a backup,
- Add, remove or change telephone DNs,
- Add, remove or change line and ringing assignments on sets.

Norstar Remote Utilities Connectivity

The NRU software application is installed on a windows-based PC located at a central administration site or at the phone system site. The NRU software on the PC and the Norstar ICS communicate through a Remote Access Device (RAD). A RAD must be installed at each of the phone system sites. There are two types of RADs available:

- Internal Remote Access Device (I-RAD). This device is available on the Compact ICS system only. The I-RAD is encased in the Compact ICS unit and is activated by software key code.
- FastRAD2. This device is an external device that connects to the Norstar ICS via a TCM port. The FastRAD is used with all Norstar systems except the Compact ICS.

Local Connectivity

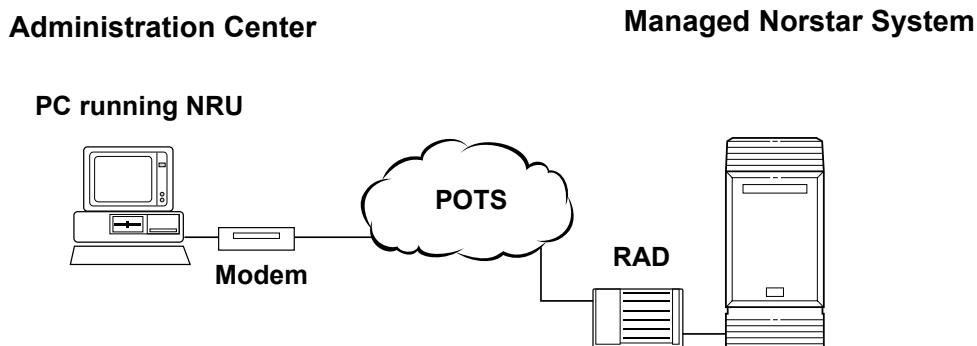
Local connectivity, for customers who wish to use the NRU software to administer the Norstar phone system on-site, is very simple. The PC running NRU software is connected to the RAD, which is in turn connected to the Norstar ICS. This configuration allows the user to configure and maintain the Norstar system using a PC rather than the station set interface.

Remote Connectivity

NRU, in conjunction with the RAD, can be used to remotely program, administer and maintain Norstar systems. In this scenario, the PC running the NRU software would be located at a remote, central administration site. The RAD would be connected to the Norstar ICS at the phone system site. The RAD can auto-answer an existing line on the Norstar system or calls can be manually transferred to the RAD by an on-site operator. This eliminates the need for a dedicated line for remote maintenance.

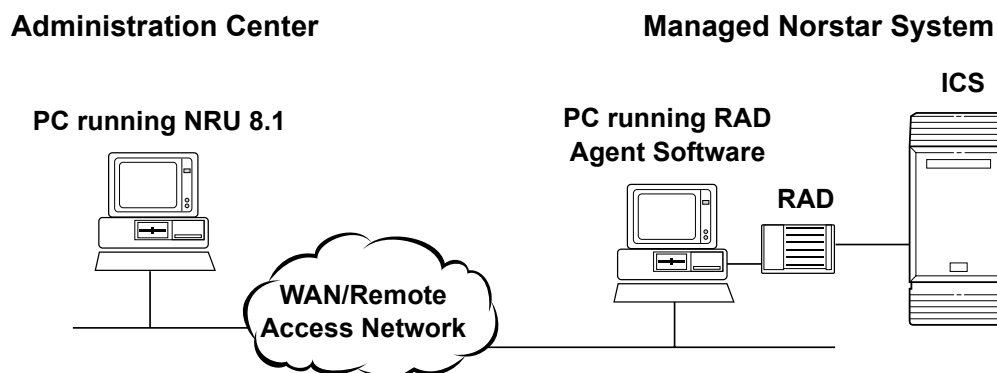
The connection between the remote, central administration site and the phone system site can be made over a standard telephone line or over the IP network.

Standard Telephone Line Connection



In this configuration, the PC running NRU at the remote, central administration site must be equipped with a standard modem. The PC can then outdial to the RAD at the phone system site, establish a connection and proceed with system programming changes.

IP Network Connection



Remote administration of a Norstar system over the IP network utilizes the RAD Agent Software, which is included on the NRU 8.1 CD-ROM. In this scenario, two PCs are required. A PC running NRU would be located at the remote, central administration site, and a PC running the RAD Agent Software would be located at the phone system site. Both of these PCs must have a LAN connection to the IP network. The PC at the administration site accesses the IP network and sends the administration information to RAD Agent enabled PC at the remote site. When the remote PC receives the signal, the RAD Agent Software accepts the information and converts it into a code that the RAD (and hence the Norstar) can understand in order to execute the command.

Norstar Remote Utilities 8.1

The NRU 8.1 package consists of 6 components:

1. Norstar Manager 3.4 software,
2. ICS Tools,
3. Integrated Data Module (IDM) 200 Tools,
4. RAD Agent Software,
5. Documentation,
6. Norstar Voice Mail Manager.

Norstar Remote Utilities includes all of the above, however, the user has the option of installing all or only some of the components. For example, if the user has only Compact ICS or Modular ICS 2.0 or higher installed, then Norstar Manager will not be required. Additionally, if the user does not have any installed IDM 200s then the IDM 200 Tools will not be required.

Norstar Remote Utilities 8.1 retains all of the previous functionality of NRU 7.0 and has the following enhancements:

- Modular and Compact ICS 4.1 compatibility,
- Norstar Voice Mail Manager,
- Windows NT compatibility.

Norstar Manager 3.4

Norstar Manager 3.4 provides the Graphical User Interface (GUI) programming interface and backup and restore function for legacy Norstar systems released prior to Compact and Modular ICS 2.0. The primary enhancements provided with Norstar Manager 3.4 are:

- an InstallShield wizard to simplify the installation process for the software
- the ability to launch ICS Tools from within a Norstar Manager session.

ICS Tools

The Norstar ICS Tools software package consists of four tools:

- Remote Set, a part of the previous releases of NRU,
- A faster Backup and Restore tool for Compact ICS 2.0 and Modular ICS 2.0 and higher,
- A Browser tool that allows you to make program changes using an expanded view of ICS programming,
- An Off-line Programming tool that allows users to make ICS programming entries or changes for downloading at a later time.

You can use the faster Backup and Restore tool, the Browser tool and the Off-line Programming tool with Norstar Compact and Modular ICS 2.0 or higher. The Remote Set tool can be used with any previous release of Norstar software, except 3x8, Compact 6x16 and Modular 8x24 DR 1.

ICS Tools presents a series of windows and menus that allow you to navigate through the different areas of the application and easily enter information and programming.

Remote Set tool

The Remote Set tool is a fast, effective, and easy to use remote administration tool that provides Windows™ based capabilities for configuring, administering, and maintaining Norstar systems and peripherals. Once an on-line connection is established, the Remote Set tool simulates either an M7310 or M7324 set. The simulated Norstar set consists of keys and text displays and provides the interface from which the user can perform the same programming or set activity that can be administered from a normal on-site extension.

Remote Set tool provides the following capabilities:

- Multimedia interface that simulates a Norstar set of the desired type when programming,
- Remote configuration, administration, and maintenance functions for most Norstar system types and software,
- Ability to remotely program Voice Mail features except those functions requiring voice capability,
- Direct queries of device status,
- Access to Feature **DEBUG sessions (used for ITAS diagnostics),
- Copying of extensions and lines within a system.

Backup and Restore tool

The Backup and Restore tool can be used with Compact or Modular ICS 2.0 or higher systems. The Backup and Restore tool retrieves a complete copy of all programming information, or selected programming information, from the ICS and stores it, usually on your PC hard drive.

You can use this new method when you:

- Install a new Norstar system,
- Backup customer programming,
- Make significant changes to the programming of an ICS.

Browser tool

The Browser tool allows you to view and change the programming of Norstar Modular ICS and Compact ICS systems running software version 2.0 or higher.

Similar to the Remote Set tool, the Browser tool lets you see and make changes to the ICS programming using an on-line connection. Instead of simulating the telephone display, the Browser tool shows the multiple levels of the programming tree (Tree List). You can use the Browser tool to:

- Show and hide headings, subheadings and settings by expanding and collapsing the levels of the Tree List,

- “Open” a heading to see additional settings,
- Change settings by selecting options and entering information,
- Change settings by adding or removing items from lists,
- Use a dialog box to copy settings,
- See programming upgrades take effect by refreshing Tree List.

Off-line Programming tool

The Off-line Programming (OLP) tool uses an Microsoft Excel workbook, formatted to resemble the paper ICS programming record, to make system programming changes from a PC for downloading at a later time. Off-line Programming reduces the amount of on-line time required to implement system programming changes. Also, the ability to schedule the update time means that after hours human supervision is not required to implement major system changes. With the Off-line Programming tool you can:

- Manually enter programming data into the ICS Excel workbook,
- Acquire full or partial programming information from an ICS that is already programmed and use it to populate an ICS workbook file,
- Alter full or partial ICS programming data by manipulating the ICS Excel workbook and then transferring the updated programming to the ICS by manual activation or time scheduling.

Integrated Data Module (IDM) 200 Tools

(Note that effective April 1, 2000, the IDM 200 is retired from the Norstar product portfolio.)

With the introduction of the IDM 200 in 1998, a new suite of remote administration tools have been included with NRU. The IDM 200 Tools allow remote programming and monitoring of the Norstar IDM 200. The IDM 200 Tools include:

- TFTPBootP, which gives the IDM 200 user the ability to contact a remote server to download firmware upgrades for the IDM 200.
- QuickSet, which provides a GUI programming interface for configuring and administering the IDM 200 remotely via the IP network. QuickSet is presented in a “Wizard” format, which guides the user through screens and asks them to select set up preferences.
- CyberMONITOR, which provides a Wide Area Network (WAN) monitoring system over the IP network. CyberMONITOR polls status conditions, monitors network traffic and monitors bandwidth utilization of network devices connected to the IDM 200. Network data and status information is compiled and reported graphically on screen or printed.

Features and Benefits of Norstar Remote Utilities Software

The following pages describe the primary features and benefits common to Norstar Remote Utilities software:

Remote System Programming

Speeds Installation, Reduces Installation Costs

Whether installing a new system or a system upgrade, NRU reduces the time traditionally required to enter Norstar system data through an on-site telephone set. Programming is performed at a centrally located PC and then downloaded to the Norstar system either immediately or at a later scheduled time.

Programming time can be reduced as much as 50%. Field technicians no longer have to be trained software programmers. Programming is completed in a central location while field staff use their time and expertise for the physical installation of equipment.

Remote Troubleshooting

Reduces Number of On-site Visits, Speeds Problem Resolution

Norstar Remote Utilities provides the service facility with a window on all their Norstar systems. When a Norstar system reports a problem, NRU can find the source before a repair crew makes a trip to the site. In many cases, the problem can be fixed by NRU, saving the time and expense of a service call.

This remote troubleshooting capability can lead to significant cost savings by reducing site repair visits by at least 30%. When a problem occurs, an automatic alarm notification is received from the system. NRU uses a modem and the Norstar system's RAD to access the system. The Norstar's system parameters are checked and the software performs a diagnostic test. If necessary, the service facility can check for faults in the system and in the wiring between the system and the telephone sets.

Note: Cold restarts, the equivalent of start-up from an on-site set, are not supported by NRU.

Remote Moves, Adds, Changes

Reduces Costs, Speeds Service

Most moves, adds and changes can be performed from the central PC, eliminating site visits for these requests. This not only lowers the cost of such services, it also reduces the time needed to deliver them.

Centralizing adds, moves and changes also gives the service facility control over the Norstar system's configuration programming so it's always up to date.

On-Line Programming

Reduces Installation Costs,
Increases Programming
Flexibility

On-line programming (using NRU's Tree Browser) provides remote programmers with the same real time access to Norstar systems that on-site system administrators have. On-line programming lets the user call a remote Norstar system and perform all the functions that an installer or system administrator would normally perform using one of the system's on-site Norstar telephones.

Some of the functions that can be viewed in an on-line session include:

- Button assignments on all sets,
- Call processing status of sets (Busy/Idle, Call Forward, Do Not Disturb),
- Set levels for display contrast, ringing volume, ring type, language, etc.,
- Complete Norstar programming for system, line and set parameters,
- System inventory that gives a summary of what equipment is attached to the Norstar system.

Centralized System Database

Increases Marketing
Opportunities

NRU can take a current inventory of an installed Norstar system's equipment. This information can be used to create a central database for sales and marketing. For instance, a check of the database would reveal which systems have Norstar Flash Voice Mail or Norstar Voice Mail and which don't, indicating who should receive sales calls.

The inventory information provides these details:

- System type,
- Design release of system hardware and software,
- Station and trunk modules,
- Sets or terminals attached to the system.

Enhanced Maintenance Database

Increases Revenue

NRU provides two enhanced maintenance features that can be used as revenue generating options for maintenance contracts:

Alarm Monitoring. With this feature, the RAD—the communications link between Norstar and the application PC—will recognize alarm messages. The RAD will then automatically dial up to two pre-programmed numbers and send an alarm message back to the service facility.

Backup and Restore. This maintains a Norstar system's most recent programming for fast and complete restoration—without an on-site visit—in the event system programming is lost.

Both of these features ensure that major system problems are recognized and resolved quickly and completely.

Security

Protects System Integrity

NRU provides two levels of security - site security and operations security.

With site security, each Norstar installation accessed by NRU is assigned its own site ID. The site IDs are checked to insure each is unique and used by only one site. Communication between NRU software and the Norstar system RAD will not be allowed until the proper site ID is presented to the RAD at the initial stages of the call setup.

With operations security, each person allowed access to NRU must have a user ID and password. Further security is provided by the proprietary communications protocol between the RAD and NRU.

Programming Record

Increases Flexibility of Record Keeping

The Tree Browser and the Off-line Programming tool can be used to print a hard copy record of the system programming. The record includes information for all lines, sets, restrictions, overrides, etc. The record is easy to read and serves as a permanent record of system programming data.

Off-line Programming

Decreases Costs, Improves Productivity

The Off-line Programming tool allows the user to make ICS programming changes using their PC for downloading at a later time. This tool helps reduce costs by reducing the on-line time required to make system changes. Specifically:

- Option to acquire or transfer partial system programming rather than complete system programming,
- For major system changes, reduce your on-line time to the time required for data transfer only not data entry and transfer.

Additionally, the ability to schedule downloading means that major changes (which may require taking the entire system down) can be entered during business hours but scheduled for implementation at night. This eliminates the need for human supervision of this process and reduces the businesses down time.

Site License Agreements

Norstar Remote Utilities is distributed via site license agreements to assist distributors and major accounts in managing their internal and external configurations. Norstar Remote Utilities allows for a reduction in operational costs, creates new service revenue opportunities, and positions a distributor as a responsive service provider through use of leading edge technology.

Option 1 - Single User Site License

- 1 non-reproducible copy of software and documentation,
- License for a single user and single PC,

- Option to purchase maintenance package for extension of agreement.

Option 2 - Multi-User Site License

- 10 non-reproducible copies of software and documentation,
- Licenses for 10 specific sites/PCs,
- Free upgrades based on terms of agreement, which are re-negotiable annually,
- Option to purchase maintenance package for extension of agreement,
- Substantially reduced pricing over single site purchase.

Option 3 - Authorized Copier Site License

- 1 copy of software and documentation,
- License to reproduce the software for an unlimited number of sites/PCs,
- Free upgrades provided based on terms of agreement, which are re-negotiable annually,
- Option to purchase maintenance package for extension of agreement,
- Option to purchase additional copies of documentation (ordered separately by CPC number),
- Substantially reduced pricing over single or multi-user purchases.

Product Evolution

Norstar Manager

Norstar Manager was initially introduced to provide a way to remotely program and administer Norstar systems via a DOS based PC. Users were given the option to program their system in on-line or off-line modes.

Norstar Manager for Windows™ Versions 1 & 2

The Norstar Manager for Windows™ software incorporated a Windows- based user interface that worked through a series of screens and menus. This allowed users to navigate the system more easily and view or make changes to the programming of the Norstar system. The software also included a communications interface, which controlled communications with customer sites, along with a report generator, which allowed customizing of the systems reports.

In addition to the capabilities of Norstar Manager, Norstar Manager for Windows™ offered:

- Remote Feature Administration Enhancements,
- Enhanced Report Printing,
- Key Label Printing.

Norstar Manager for Windows™ 3.1

Version 3.1 supported all the features of versions 1 and 2. In addition, the removal of Off-Line programming allowed for performance improvements as high as 50%.

The following enhancements were also made:

- Design support for Modular ICS XL and XC systems,
- Administration of Norstar voice mail systems,
- Administration of Companion system for Norstar.

The RAD on Norstar Manager Release 3.1 provided translation and processing of Norstar administration commands, and automatic detection and reporting of Modular ICS XL and XC alarms.

Norstar Remote Utilities 1.0

The first version of Norstar Remote Utilities, introduced in 1996, expanded Norstar's remote administration portfolio. NRU 1.0 consisted of three components: Norstar Manager 3.2 software, Remote Set Software (RSS), and documentation.

Norstar Remote Utilities was bundled to include all three components, but the user had the option of installing both Norstar Manager 3.2 and the Norstar Remote Set Software or only the RSS.

Norstar Remote Utilities retained all of the previous functionality of Norstar Manager 3.1 and had the following enhancements:

- Alternative options for Norstar system database administration,
- Administration of Norstar Compact ICS database,
- Improved installed base administration coverage,
- Selectable installation of Remote Administration Software,
- Bundled packaging of alternative administrative software.

The Norstar Manager component of NRU 1.0 (Norstar Manager 3.2) had the same features and functionality as Norstar Manager 3.1. A new feature of Norstar Manager 3.2 was the application launcher, which provides access to the new Remote Set Software from within the Norstar Manager 3.2 application.

When launched from Norstar Manager 3.2, the Remote Set Software goes directly to the set simulation screen. After launching Remote Set Software, the Norstar Manager 3.2 application is disabled. Exiting from Remote Set Software returns the user to the Norstar Manager 3.2 customer database screen.

Note: Remote Set Software and Norstar Manager 3.2 cannot be operational at the same time.

Norstar Remote Utilities 2.0

Norstar Remote Utilities 2.0 retained all of the functionality included with Norstar Remote Utilities 1.0 plus some enhancements to the Norstar Manager component of the software. Norstar Manager 3.3 provides the following enhancements over Manager 3.2:

- Compatibility with Modular ICS Release 1.1 software,
- Faster operating speed to work in conjunction with the FastRAD.

Norstar Remote Utilities 8.1 Accessory Compatibility

Norstar Remote Utilities administers all Norstar terminals, the Analog Terminal Adapter, Norstar voice messaging systems, Companion system for Norstar, the IDM 200 and the RAD. It can “see” but not administer these accessories:

- PCI Card,
- NorLink,
- SMDR,
- Doorphone.

Norstar Remote Utilities 8.1 Hardware and Software Specifications

Hardware

- A 486 PC or higher (Pentium® is recommended),
- A minimum of 8 MB RAM (32 MB RAM is recommended),
- MS-DOS 5.0 or later,
- 400+ kilobytes of conventional memory available in Windows®,
- A hard disk (minimum 100 MB free),
- VGA color monitor,
- A CD-ROM drive,
- Microsoft® Windows® 95,
- A Windows® compatible mouse,
- A minimum 14.4 Kbps Hayes-compatible internal or external modem,
- 1 serial port (required for direct connection to RAD).

Norstar Remote Utilities can be used on-site with Norstar systems if the PC is equipped with RS-232 serial communications port. In this case, a modem is not required. However, a Norstar RAD must be attached to a station port on each Norstar system to allow communications

between the PC and individual Norstar. The RAD acts as a modem and communications interface to the internal Norstar messaging system.

Software

Norstar Remote Utilities software is delivered on CD-ROM.

Norstar Upgrades

Introduction

With the introduction of Modular and Compact ICS 4.0 and higher, Norstar will continue the delivery of significant new values, including the availability of PRI trunk access on the Modular ICS, programmable auto attendant prompts on the Compact ICS and a host of new call processing features enabled for both platforms.

In order to deliver these new values, the core software on both platforms have undergone significant development that enables both the functionality of the 4.0 release and provides a new foundation for delivery of future customer value.

Application Compatibility

For customers seeking to benefit from the advanced capabilities of the new Modular and Compact ICS software, upgrade of their existing applications is essential. Due to the significance of the software development, installed base customers that upgrade their core software to ICS 4.0 and higher must upgrade their Norstar applications. This includes Norstar Voice Mail, including Dial-by-Name, Norstar ACD, Norstar PC Console, Flash Voicemail, Flash ACD and Norstar TSP.

In order to facilitate the acceptance of the ICS 4.0 (and higher) values by installed base customers, and make this upgrade process as simple as possible for the majority of customers, Norstar is providing upgrade bundles that include the core software and all Norstar application upgrades. These bundles address the various combinations of the Modular/NAM/Flash platforms and the Compact/NAM/Flash platforms, and provide a single order code to enable simple customer upgrades.

Upgrades to the MINUET, CINPHONY and PRELUDE ACD products will continue to be available directly from Cintech, under the terms of their maintenance agreement. Customers with Norstar Flash ACD should contact ITAS for an upgrade keycode.

Upgrading Norstar Compact ICS systems

All Norstar applications, except for Personal Call Manager, must be upgraded to be compatible with Compact ICS 4.0 and higher. Upgrades are available as separately orderable items. Some of the upgrades have also been included in the bundled convenience packages.

This chart provides a quick reference of Norstar application compatibility and upgrade requirements for Compact ICS 4.0 and higher.

Application	Upgrade Required	Upgrade to Version (minimum)
Norstar Voice Mail 1.0	Yes	NVM 4.0
Norstar Voice Mail 2.0	Yes	NVM 4.0
Norstar Voice Mail 2.1	Yes	NVM 4.0
Norstar Voice Mail 3.0	Yes	NVM 4.0
Flash Voice Mail	Yes	Flash Voice Mail 1.9 and higher
CINPHONY I	Yes	CINPHONY 3.1 and higher
CINPHONY II	Yes	CINPHONY 3.1 and higher
PRELUDE	Yes	PRELUDE 3.1 and higher
MINUET	Yes	MINUET 1.1 and higher
Flash ACD	Yes	Flash ACD 1.9 and higher
PC Console 1.0	Yes	PC Console 1.1 and higher
Personal Call Manager	No	No upgrade required
TAPI Service Provider 1.1	Yes	TAPI Service Provider 2.0 and higher
TAPI Service Provider 1.2	Yes	TAPI Service Provider 2.0 and higher
Norstar Remote Utilities 4.0	Yes	Norstar Remote Utilities 8.0 and higher
Norstar Remote Utilities 5.0	Yes	Norstar Remote Utilities 8.0 and higher
Norstar Remote Utilities 7.0	Yes	Norstar Remote Utilities 8.0 and higher

Bundled upgrade packages for Compact ICS systems

Four convenience bundles have been created to provide an efficient way of ordering upgrades for the majority of Norstar Compact ICS customer implementations. Individual upgrades are also available as separately orderable items.

Market	Bundled Package	Includes
CDA	Package #1 for Compact ICS Standard Software with IRAD enabled and Flash Voice Mail enabled	<ul style="list-style-type: none"> – Flash PCMCIA Software Kit (CDA English/French). – PC Console 1.2 Upgrade. – Personal Productivity Suite.
CDA	Package #2 for Compact ICS Standard Software with IRAD enabled with Auto Attendant Programmable Prompts and Flash Voice Mail enabled	<ul style="list-style-type: none"> – Flash PCMCIA Software Kit (CDA English/French). – PC Console 1.2 Upgrade. – Personal Productivity Suite.
USA	Package #3 for Compact ICS Standard Software with IRAD enabled and Flash Voice Mail enabled	<ul style="list-style-type: none"> – Flash PCMCIA Software Kit (USA English/Spanish). – PC Console 1.2 Upgrade. – Personal Productivity Suite.
USA	Package #4 for Compact ICS Standard Software with IRAD enabled with Auto Attendant Programmable Prompts and Flash Voice Mail enabled	<ul style="list-style-type: none"> – Flash PCMCIA Software Kit (USA English/Spanish). – PC Console 1.2 Upgrade. – Personal Productivity Suite.

Note: NAM based applications, Flash ACD, and NRU are not included in the above bundles. Compact ICS customers must order individual upgrades for these items.

Norstar Flash ACD requires an upgrade for compatibility with Compact ICS 4.0 and higher. Due to the release date for Flash ACD, there are likely very few Flash ACDs in the field that require the upgrade. Customers with Norstar Flash ACD should contact ITAS for an upgrade keycode.

The Norstar Remote Utilities upgrade is also not included in the upgrade bundles. Those NRU customers who have purchased a NRU Software Maintenance Agreement will receive the NRU upgrade at no additional charge. NRU customers without a software maintenance agreement will be able to purchase the upgrade as a separately orderable item.

All Norstar NAM-based ACD products require upgrading for operation with Compact ICS 4.0 and higher. When a Norstar customer purchases one of these ACD products, they have the option of purchasing an ACD software maintenance plan from Cintech Telemangement. Those ACD customers who presently have a maintenance plan with Cintech will receive the required ACD upgrade through the plan (directly from Cintech).

ACD customers who do not currently have a maintenance plan with Cintech, will be required to purchase such a plan from Cintech in order to receive the upgrade. ACD upgrades are not included in the upgrade bundles.

Upgrading Norstar Modular ICS systems

All Norstar applications, except for Personal Call Manager, must be upgraded to be compatible with Modular ICS 4.0 and higher. Upgrades are available as separately orderable items. Some of the upgrades have also been included in the bundled convenience packages.

This chart provides a quick reference of Norstar application compatibility and upgrade requirements for Modular ICS 4.0.

Application	Upgrade Re-quired	Upgrade to version
Norstar Voice Mail 1.0	Yes	NVM 4.0
Norstar Voice Mail 2.0	Yes	NVM 4.0
Norstar Voice Mail 2.1	Yes	NVM 4.0
Norstar Voice Mail 3.0	Yes	NVM 4.0
Flash Voice Mail	Yes	Flash Voice Mail 1.9 and higher
CINPHONY I	Yes	CINPHONY 3.1 and higher
CINPHONY II	Yes	CINPHONY 3.1 and higher
PRELUDE	Yes	PRELUDE 3.1 and higher
MINUET	Yes	MINUET 1.1 and higher
Flash ACD	Yes	Flash ACD 1.9 and higher
PC Console 1.0	Yes	PC Console 1.1 and higher
Personal Call Manager	No	No upgrade required
TAPI Service Provider 1.1	Yes	TAPI Service Provider 2.0 and higher
TAPI Service Provider 1.2	Yes	TAPI Service Provider 2.0 and higher
Norstar Remote Utilities 4.0	Yes	Norstar Remote Utilities 8.0 and higher
Norstar Remote Utilities 5.0	Yes	Norstar Remote Utilities 8.0 and higher
Norstar Remote Utilities 7.0	Yes	Norstar Remote Utilities 8.0 and higher

Upgrade Tools

Upgrading any Release 3 or earlier Modular ICS system to Release 4.0 and higher requires the use of an Upgrade Tool to ensure that no programming data is lost in the upgrade. There are three upgrade tools available for the various types of Modular ICS systems that require upgrading:

- NA Modular ICS Upgrade Tool
 - Used to upgrade NA Modular ICS 1.0, 1.1, 2.0 or 3.0 to NA Modular ICS 4.0, USA Modular ICS XC 4.0 and higher, or CDA Modular ICS XC 4.0 and higher.
- CAN Modular ICS XC Upgrade Tool
 - Used to upgrade CDA Modular ICS XC 1.0, 1.1, 2.0 or 3.0 to CDA Modular ICS XC 4.0 and higher.
- USA Modular ICS XC Upgrade Tool
 - Used to upgrade USA Modular ICS XC 1.0, 1.1, 2.0 or 3.0 to USA Modular ICS XC 4.0 and higher.

Upgrading from:	Upgrading to:		
	NA MICS 4.0 and higher	USA MICS XC 4.0 and higher	CDA MICS XC 4.0 and higher
NA MICS 1.0	NA MICS Upgrade Tool	NA MICS Upgrade Tool	NA MICS Upgrade Tool
USA MICS XC 1.0	Not applicable	USA MICS XC Upgrade Tool	Not applicable
CDA MICS XC 1.0	Not applicable	Not applicable	CDA MICS XC Upgrade Tool
NA MICS 1.1	NA MICS Upgrade Tool	NA MICS Upgrade Tool	NA MICS Upgrade Tool
USA MICS XC 1.1	Not applicable	USA MICS XC Upgrade Tool	Not applicable
CDA MICS XC 1.1	Not applicable	Not applicable	CDA MICS XC Upgrade Tool
NA MICS 2.0	NA MICS Upgrade Tool	NA MICS Upgrade Tool	NA MICS Upgrade Tool
USA MICS XC 2.0	Not applicable	USA MICS XC Upgrade Tool	Not applicable
CDA MICS XC 2.0	Not applicable	Not applicable	CDA MICS XC Upgrade Tool
NA MICS 3.0	NA MICS Upgrade Tool	NA MICS Upgrade Tool	NA MICS Upgrade Tool
USA MICS XC 3.0	Not applicable	USA MICS XC Upgrade Tool	Not applicable

	Upgrading to:		
Upgrading from:	NA MICS 4.0 and higher	USA MICS XC 4.0 and higher	CDA MICS XC 4.0 and higher
CDA MICS XC 3.0	Not applicable	Not applicable	CDA MICS XC Upgrade Tool

Each of these upgrade tools is available as a separately orderable item.

Also, the Upgrade Tools are included in the Modular ICS Upgrade Bundles, which have been created to provide an efficient upgrade package to address the most common Modular ICS customer implementations.

Bundled upgrade packages for Modular ICS systems

Seven upgrade bundles have been created to provide an efficient way of ordering upgrades for the majority of Norstar Modular ICS customer implementations. Individual upgrades are available as separately orderable items should the distributor prefer this to the bundles.

Bundled Package	Core Upgrade Tool (included in bundle)	Includes
Package #1 for NA Modular ICS Software with NAM Applications	NA MICS Upgrade Tool	NAM Upgrade Package with: <ul style="list-style-type: none"> • NVM 4.0 CD ROM, • NVM 4.0 Upgrade Kit, • PC Console 1.2 Upgrade, • Personal Productivity Suite.
Package #2 for CDA Modular ICS XC Software with NAM Applications	CDA MICS XC Upgrade Tool	NAM Upgrade Package with: <ul style="list-style-type: none"> • NVM 4.0 CD ROM, • NVM 4.0 Upgrade Kit, • PC Console 1.2 Upgrade, • Personal Productivity Suite.
Package #3 for USA Modular ICS XC Software with NAM Applications	USA MICS XC Upgrade Tool	NAM Upgrade Package with: <ul style="list-style-type: none"> • NVM 4.0 CD ROM, • NVM 4.0 Upgrade Kit, • PC Console 1.2 Upgrade, • Personal Productivity Suite.
Package #4 for NA Modular ICS Software with Flash Applications	NA MICS Upgrade Tool	Flash Upgrade Package A with: <ul style="list-style-type: none"> • Flash PCMCIA Software Kit (US English/Spanish), • PC Console 1.2 Upgrade, • Personal Productivity Suite.
Package #5 for USA Modular ICS XC Software with Flash Applications	USA MICS XC Upgrade Tool	Flash Upgrade Package A with: <ul style="list-style-type: none"> • Flash PCMCIA Software Kit (US English/Spanish), • PC Console 1.2 Upgrade, • Personal Productivity Suite.
Package #6 for NA Modular ICS Software with Flash Applications	NA MICS Upgrade Tool	Flash Upgrade Package B with: <ul style="list-style-type: none"> • Flash PCMCIA Software Kit (CDA English/French). • PC Console 1.2 Upgrade. • Personal Productivity Suite.

Bundled Package	Core Upgrade Tool (included in bundle)	Includes
Package #7 for CDA Modular ICS XC Software with Flash Applications	CDA MICS XC Upgrade Tool	Flash Upgrade Package A with: <ul style="list-style-type: none"> • Flash PCMCIA Software Kit (CDA English/French), • PC Console 1.2 Upgrade, • Personal Productivity Suite.

Note: CINPHONY, PRELUDE or MINUET ACD, Flash ACD, and NRU are not included in the above bundles. Modular ICS customers must order individual upgrades for these items.

Norstar Flash ACD requires an upgrade for compatibility with Modular ICS 4.0 and higher. Due to the release date for Flash ACD, there are likely very few Flash ACDs in the field that require the upgrade. Customers with Norstar Flash ACD should contact ITAS for an upgrade keycode.

The Norstar Remote Utilities upgrade is also not included in the upgrade bundles. Those NRU customers who have purchased a NRU Software Maintenance Agreement will receive the NRU upgrade at no additional charge. NRU customers without a software maintenance agreement will be able to purchase the upgrade as a separately orderable item.

All Norstar ACD products require upgrading for operation with Modular ICS 4.0 and higher. When a Norstar customer purchases one of the NAM-based ACD products, they have the option of purchasing an ACD software maintenance plan from Cintech Telemangement. Those ACD customers who presently have a maintenance plan with Cintech will receive the required ACD upgrade through the plan (directly from Cintech).

ACD customers who do not currently have a maintenance plan with Cintech will be required to purchase such a plan from Cintech in order to receive the upgrade. ACD upgrades are not included in the upgrade bundles.

Modular ICS 4.0 and higher Peripheral Compatibility

The Modular ICS 4.0 and higher release also affects compatibility with a few of the Norstar peripheral devices, as indicated in the following chart:

Peripheral Device	Compatible with 4.0 and higher	Upgrade path
ATA II	Yes	Not required
Busy Lamp Field	Yes	Not required
Central Answering Position/Key Lamp Module	Yes	Not required
CTA 100, 150i, 500dm	Yes	Not required
Norstar Data Interface	No	MICS 4.1 required
Doorphone	Yes	Not required
FastRAD	Yes ¹	FastRAD II
RAD	No	FastRAD II
SMDR5 or earlier	No	SMDR6
Note 1: FastRAD is compatible with Modular ICS 4.0 and higher provided that PRI is not being used on the system. Upgrade to FastRAD II if Modular ICS 4.0 and higher with PRI is used.		

Appendix A: Legacy Products

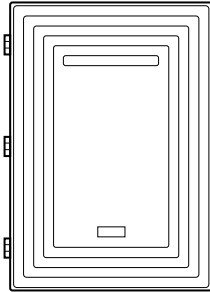
The Norstar Compact 6X16 and Modular 8X24 products have been Manufacture Discontinued and replaced with the Norstar ICS products. Also, all StarTalk voice mail models have been market retired.

The new ICS core platforms support the features and applications demanded by today's highly competitive business market.

In order to take advantage of the many new and evolving applications available for Norstar, it is highly recommended that customers upgrade to the Norstar ICS product portfolio.

Norstar Compact 6X16 Key Service Unit

Compact 6X16 KSU



Length: 516 mm (20.3 in)
Width: 356 mm (14 in)
Depth: 87 mm (3.4 in)
Weight: 5.15 kg (11.41 lb)
Color: Dolphin Grey

- The Compact (6X16) system is a self-contained unit.
- The system can be configured with up to six lines and sixteen stations.
- It has one emergency transfer teledapt port and an internal power supply.
- The software cartridge includes all administration and call processing features required to operate a Norstar Compact system.
- The Compact requires a CII-C6 for CMS/CLASS functionality (see Peripherals for detail).
- Two versions of Compact are:
 - 6X16 (Releases DR1, DR2 and DR5), and
 - 6X16 DS with Disconnect Supervision (Release DR5-DS).
The 6X16 software is not compatible with 6X16 DS system and the 6X16 DS software is not compatible with the 6X16 system.

Note: The Compact 6X16 was market-retired effective February 20, 1997.

Norstar Compact 6X16 Software Features

Key: √ Denotes availability, E - Denotes enhancements, N - Denotes new feature

Compact 6x16 Features	DR1	DR2	DR5	5-DS
Accidental Disconnect	√	√	√	√
Answer Buttons			N	√
Autodial Keys	√	√	E	√
• Number of Digits	16	16	24	24
• Store Facility Access			√	√
• Store Reach Through Codes			√	√
Automatic Line Selection	√	√	√	√
Automatic Set Relocation	√	E	√	√
• Programmable On/Off		√	√	√
Auxiliary ringing	√	√	E	√
• For lines in service modes			√	√
Background Music	√	√	√	√
Busy Lamp Indication	√	√	E	√
• On line pool key			√	√
Button Inquiry	√	√	E	√
• Examine autodial number			√	√
Call Display when busy	√	√	√	√
Call Duration timer	√	√	√	√
Call Forward	√	√	E	√
• All calls	√	√	√	√
• Call Forward Busy			√	√
• No Answer			√	√
• Override	√	√	√	√
Call Identification (Internal Calls)	√	√	√	√
Call Park		N	E	√
• Prefix Digit		1	0-9	0-9
• Time outs (30-600 sec.)			√	√
• With Callback		√	√	√
Call Pickup	√	E	E	√
• Directed			√	√
• Pickup Groups (4 groups)	√	√	√	√
• Trunk Answer From Any Station	√	√	√	√
Call Queuing			N	√
Camp On			N	√
Central Answering Position		√	E	√
• CAP feature and autodial only			N	√
• BLF indication		√	√	√

Compact 6x16 Features	DR1	DR2	DR5	5-DS
Class of Service			N	√
• COS Passwords			19	19
• Dialing Abilities			√	
CMS/CLASS Call Information Session			N	√
CMS/CLASS Caller Log			N-160 calls	60
CMS/CLASS Calling Name Display			N	√
CMS/CLASS Calling Number Display			N	√
CMS/CLASS LOGIT Feature			N	√
CMS/CLASS Long Distance Indicator			N	√
Conference	√	√	E	√
• Independently hold two calls		√	√	√
• Using Privacy			√	√
Custom Bus. Products Compatibility		N	√	√
Delayed Ring Transfer	√	E	√	√
• To prime	√	√	√	√
• After programmable # of rings		√	√	√
Dial "X" Set	√	E	E	√
• Direct Digit Dial	0	0	0-9	0-9
Dialing Modes	√	√	E	√
• Standard	√	√	√	√
• Automatic			√	√
• Predial			√	√
Dial Mode for Lines - pulse/tone	√	√	√	√
Dial Pad Feedback	√	√	√	√
Direct Station Select Buttons	√	√	√	√
Disconnect Supervision				N
Discriminating Ringing at Set	√	√	√	√
Distinctive Ringing Cadence	√	√	√	√
Do Not Disturb	√	√	√	√
End-to-End Signaling		N	√	√
• Short tones internal		√	√	√
External Line Access	√	√	√	√
Flexible Call Restrictions (Restrictions on a per line basis)	√ Tables	E Tables	N Filters	√ Filters
• Dialing Filers (max)			25	25
• Dialing Filters on Lines (max)			255	25
• Filter Restrictions (max)			200	200
• Including System Speed Dial			√	√
Flexible Numbering Plan		N	√	√
Group Listening			N	√

Compact 6x16 Features	DR1	DR2	DR5	5-DS
Handsfree • Automatic	√	√	E √	√ √
Hold • Held Line Reminder	√	E √	√ √	√ √
Host Delay			N	√
Host System Signaling • Feature code compression • Pause, run/stop, timed release • Programmed release • Recall / Link	√ √ √	√ √ √	E √ √ √	√ √ √ √
Hot Line			N	√
Installer Password		N	√	√
Intercom Key Assignment	√	√	√	√
Language Choice	√	√	√	√
Last Number Redial • Number of Digits • Selects Facility Used on Original Call	√ 16	√ 16	E 24 √	√ 24 √
Line Button Relocation			N	√
Line Names		N	√	√
Line Pool(s)	√	E	√	√
Line Redirection				N
Line Types (Pool, Public, Private)	√	N	√	√
Link/Flash (Recall)	√	E	√	√
Listen On Hold	√	√	√	√
Long Tones				N
Loss Plan	√	√	√	√
Messages (Send, Waiting, Reply)		√	√	√
Multiple Line Appearances	√	√	√	√
Music/Tone/Silence On Hold	√	√	√	√
Night Service • Flexible • Service Modes		E √	E √ √	√ √ √
Onhook Dialing • Automatic Dial • Predial • Standard	√ √	√ √	E √ √ √	√ √ √ √
Paging • Internal (Multiple Zones) • Page Yes/No Per Set	√	E √	E √ √	√ √ √
Password Protection		N	√	√

Compact 6x16 Features	DR1	DR2	DR5	5-DS
Preselection/Call Screening	√	√	√	√
Prime Line Select	√	√	√	√
Prime Set(s) • Multiple prime sets	√	E √	√ √	√ √
Priority Call		N	√	√
Privacy • On/Off • Per Line	√	√	E √ √	√ √ √
Ringing Line Preference	√	√	√	√
Receive Tones				N
Restriction Override Password(s)	√	E	√	√
Ring Again (Internal) • On busy line pool	√	E √	√ √	√ √
Saved Number Redial • Number of Digits		N 16	E 24	√ √
Service Modes			N	
Speed Dial: Personal • All sets supported • Number of Digits • Name Support	√	E √ 16	E √ 24 √	√ √ √ √
Speed Dial: System • Number of Entries • Number of Digits • Name Support	√	E 70 16	E √ 24 √	√ √ √ √
System Version		√	√	√
Telephone Admin Lock			N	√
Time /Date Display	√	√	E	√
Transfer • Immediate • With announcement • With Callback • Unified (Immediate & announce) • Over Public Network	√	E √ √ √ √	E Unified Unified √ √	√ Unified Unified √ √
Unsupervised Conference				N
User programmable feature keys	√	√	√	√
Voice Call	√	√	√	√
Voice Call Deny	√	√	√	√

Upgrading from Compact DR2 to Compact DR5

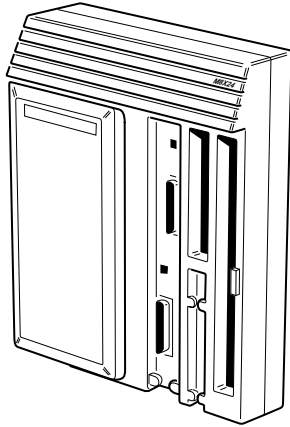
A Compact DR2 to DR5 upgrade requires the installation of a new DR5 software cartridge and reprogramming of the system, but no additional hardware.

To upgrade a customer so that they can access CMS/CLASS network features, a Compact Call Identification Interface (CII/C6) is required in addition to a DR5 software cartridge and programming.

Compact DR5 is compatible with all M7000 terminals, including M7100.

Norstar Modular 8X24 System

Modular 8X24 KSU

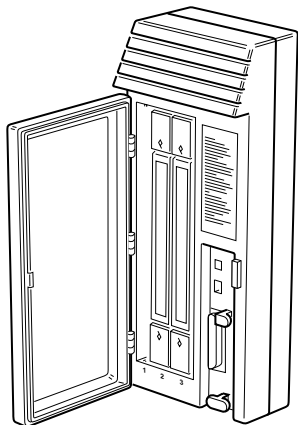


Length: 516 mm (20.3 in)
 Width: 395 mm (15.5 in)
 Depth: 171 mm (6.73 in)
 Weight: 8.2 kg (18 lb)
 Color: Dolphin Grey

- This system is designed on a module- and cartridge-based concept that offers easy installation, maintenance, expansion and customization.
- The base Modular 8X24 supports up to 8 lines and 24 stations, but can expand with Trunk and Station Modules for additional lines and terminals.
- The Modular 8X24 can support up to 6 Trunk Modules, each with a maximum of 12 CO lines, or 6 Station Modules each with 16 stations.
- When fully expanded, the Modular 8X24 system supports a combination of 128 ports on a combination of lines and stations, up to a maximum of 80 CO lines or 120 stations or combinations of the two. (See next page for acceptable configuration combinations.)
- The system can be configured as either analog CO lines, station ports or connections for other devices such as personal computers, data devices, analog terminal adapter, etc.
- There are two built-in cartridge slots in the base Modular 8X24 unit. The feature cartridge slot (the smaller of the two) houses the system software. The expansion cartridge slot (for a two- or six-port cartridge) is used to connect Trunk and Station Modules.
- Central Office lines enter the Norstar, and station ports exit the Norstar through two amphenol connectors.
- The Modular 8X24 is also equipped with two emergency transfer ports used to connect 500/2500 sets in the event of a power failure.

Note: Modular 8X24 was market retired Feb. 20, 1997, and the Copper Station and Copper Trunk Modules were market retired effective April 1, 2000. At this time, Modular 8X24 Expansion Cartridge will not be market retired.

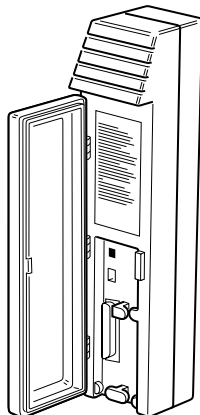
Copper Trunk Module (12x0)



Length: 625 mm (24.6 in)
Width: 198 mm (7.8in)
Depth: 171 mm (6.73 in)
Weight: 5142 g (11.33 lb)
Color: Dolphin Grey

- Each Trunk Module (TM) holds up to three Trunk Cartridges (TC).
- Each Trunk Cartridge expands the base Modular 8X24 system or Modular ICS by four Central Office (CO) lines (four ports per cartridge) up to a maximum of 12 CO lines per Trunk Module. (Note: The E&M/DISA cartridge is an exception. It supports 2 ports/cartridge.)
- There is one emergency transfer port per Trunk Module.
- The Copper Trunk Module is compatible with the Modular ICS as well as the Modular 8X24.

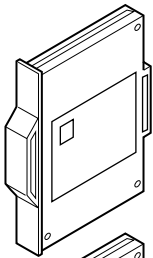
Copper Station Module (0x16)



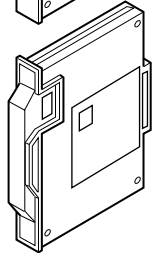
Length: 625 mm (24.6 in)
Width: 98 mm (3.85 in)
Depth: 171 mm (6.73 in)
Weight: 2415 g (5.31 lb)
Color: Dolphin Grey

- Each Station Module expands the base Modular 8X24 system or Modular ICS by up to 16 digital station ports, which support any Norstar terminal.
- The Copper Station Module is compatible with the Modular ICS as well as the Modular 8X24.

Software Feature Cartridge



DR2 RAM only



ROM & RAM (DR3,
DR4, DR5, Centrex,
Centrex+)

- The feature cartridge contains the system software for the Modular 8X24 operation, including the call processing, administration, and maintenance features and functions.
- Post DR2 feature cartridges come in two parts for faster, easier and less expensive upgrades:
 - The Read Only Memory (ROM) section houses system software and is easily replaced when upgrading.
 - The Random Access Memory (RAM) section stores customer data (features and functions you have access to) and remains unchanged.
- The Modular 8X24 System can operate on any of six software feature packages:
 - DR2 Feature Package with 90 standard features.
 - DR3 Feature Package with all DR2 features plus more than 20 additions and enhancements.
 - Centrex Feature Package with all DR3 features plus a special set of unique features that greatly simplify and enhance Centrex service.
 - DR4 Feature Package with all DR3 features plus E&M type II TIE line, DID and other capabilities to satisfy customer needs for enhanced public and private networking.
 - DR5 Feature Package with all DR4 features plus Calling Number/Name Display, Call Log and other CMS/CLASS related features.
 - Centrex+, which is the Centrex Feature Package with DR5 features.

Note: Centrex + does not support E&M or DID trunking, Modular 8X24 Configuration Options.

Norstar Modular 8X24 Software Features

Key: √ Denotes availability, E - Denotes enhancements, N - Denotes new feature

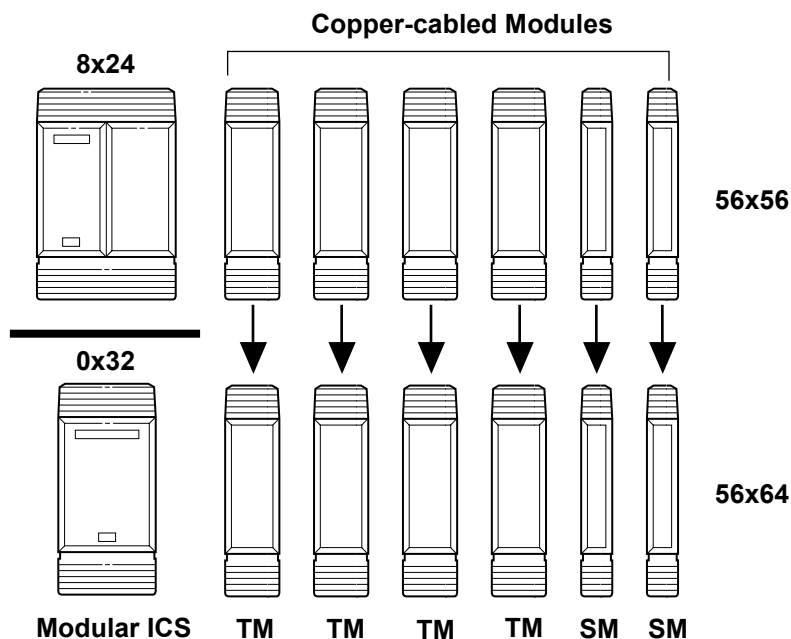
Modular 8x24 Features	DR2	DR3	CTX	DR4	DR5	CTX +
Accidental Disconnect	√	√	√	√	√	√
Answer Buttons	√	√	√	√	√	√
Auto Answer				N	√	
Autodial Keys	√	E	√	√	√	√
Automatic Line Selection	√	√	√	√	√	√
Automatic Set Relocation	E	√	√	√	√	√
Auxiliary Ringing	√	E	√	√	√	√
Background Music	√	√	√	√	√	√
Busy Lamp Indication	√	√	√	√	√	√
Button Inquiry	√	E	√	√	√	√
Call Display when busy	√	√	√	√	√	√
Call Duration timer	√	√	√	√	√	√
Call Forward All Calls	√	√	E	√	√	√
Call Forward No Answer	√	√	E	√	√	√
Call Forward On Busy		N	E	√	√	√
Call Forward Override	√	√	E	√	√	√
Call Identification (Internal Calls)	√	√	√	√	√	√
Call Park	√	√	√	E	√	√
• Prefix Digits				√	√	E
Call Pickup	E	√	E	√	√	√
• Directed	√	√	√	√	√	√
• Group			√	√	√	√
Call Queuing		N	√	√	√	√
Camp On (Call Waiting)		N	√	√	√	√
Class of Service				N	√	√
CMS/CLASS Call Info Session					N	√
CMS/CLASS Call Log					N-600 calls	√
CMS/CLASS LOGIT (Call Logging)					N	√
CMS/CLASS Long Distance Indic.					N	√
CMS/CLASS Name Display					N	√
CMS/CLASS Number Display					N	√
Conference	√	√	E	E	√	
Custom Business Product Compatibility	√	√	√	√	√	√
Delayed Ring Transfer	E	√	√	√	√	√
Dial "0" Station (see also direct dial)	E	E	√	E	√	√

Modular 8x24 Features	DR2	DR3	CTX	DR4	DR5	CTX +
Dialing Modes		N	√	√	√	√
• Automatic		√	√	√	√	√
• Predial		√	√	√	√	√
Dialing Filters				N	√	
Direct Dial (see also Dial "0" station)	√	√	√	E	√	E
• Attendant Digit				N	√	√
• Multiple Attendants				N	√	√
Direct Station Select buttons	√	√	√	√	√	√
DISA (Direct Inward System Access)				N	√	
Disconnect Supervision		N	√	√	√	√
Discriminating Ringing at Set	√	√	√	√	√	√
Distinctive Ringing at Set	√	√	√	√	√	√
End to End Signaling	√	E	√	√	√	√
• Long tones—External	√	√	√	√	√	√
• Long tones—Internal	√	√	√	√	√	√
• Long tones—External paging port		√	√	√	√	√
• Short tones—External	√	√	√	√	√	√
• Short tones—Internal	√	√	√	√	√	√
Enhanced Trunking Connectivity with E&M and DID				N	√	
Flexible Call Restrictions & Override	E	E	√	E	√	√
Group Listening		N	√	√	√	√
Handsfree	√	E	√	√	√	√
• Automatic		√	√	√	√	√
Hold	√	√	E	√	√	√
Hot Line		N	√	√	√	√
Installer Password	√	√	√	√	√	√
Host System Signaling	E	E	E	√	√	√
• Feature code compression		√	√	√	√	√
• Recall/ Link	√	√	√	√	√	√
• Pause, run/stop, timed release	√	√	√	√	√	√
• Programmed Release		√	√	√	√	√
Language Choice	√	√	√	√	√	√
Last Number Redial	√	√	√	√	√	√
Line Redirection				N	*	
Line Button Relocation		N	√	√	√	√
Line Profile	√	√	√	√	√	√

Modular 8x24 Features	DR2	DR3	CTX	DR4	DR5	CTX +
Line Pool(s)	E	E	√	E	√	E
• Busy Status		√	√	√	√	√
Long Tones	√	E	√	√	√	√
Maintenance Alarms	√	√	√	√	√	√
Make Set Busy (Do Not Disturb)	√	√	E	√	√	√
Night Service - Service Modes	E	E	√	√	√	√
Onhook Dialing	√	E	√	√	√	√
Paging	E	E	√	√	E	E
• External	√	√	√	√	√	√
• Y/N on a Per Set Basis					N	N
Priority Call (Executive Busy Override)	√	√	E	√	√	√
Privacy Control		N	√	√	√	√
Ring Again	E	√	E	√	√	√
• On Busy Set	√	√	√	√	√	√
• On Busy Line Pool	√	√	√	√	√	√
• On No Answer (Internal)	√	√	√	√	√	√
Saved Number Redial	√	E	√	√	√	√
Set Profile	√	√	√	√	√	√
Speed Dial: Personal	√	E	√	√	√	√
• Bypass Restrictions		√	√	√	√	√
• Line Selection		√	√	√	√	√
• Names		√	√	√	√	√
Speed Dial: System	E	E	√	√	√	√
• Bypass Restrictions		√	√	√	√	√
• Line Selection		√	√	√	√	√
• Names		√	√	√	√	√
Target Lines				N	√	
Telephone Admin Lock		N	√	√	√	√
Time/Date Display	√	E	√	√	√	√
• Show Time		√	√	√	√	√
Transfer	E	√	E	E	E	E
• Immediate (Callback)	√	√	√	√	√	√
• Over Public Network				√	√	
• With Announcement	√	√	√	√	√	√
Unsupervised Conference				N	√	
• Voice Call	√	√	√	√	√	√
Voice Call Deny	√	√	√	√	√	√

Upgrades from Modular 8X24 to Modular ICS

Analog to Analog 8X24 to Modular ICS upgrade (no T1)



This upgrade shows an analog to analog conversion. All existing Trunk and Station Modules will be carried forward.

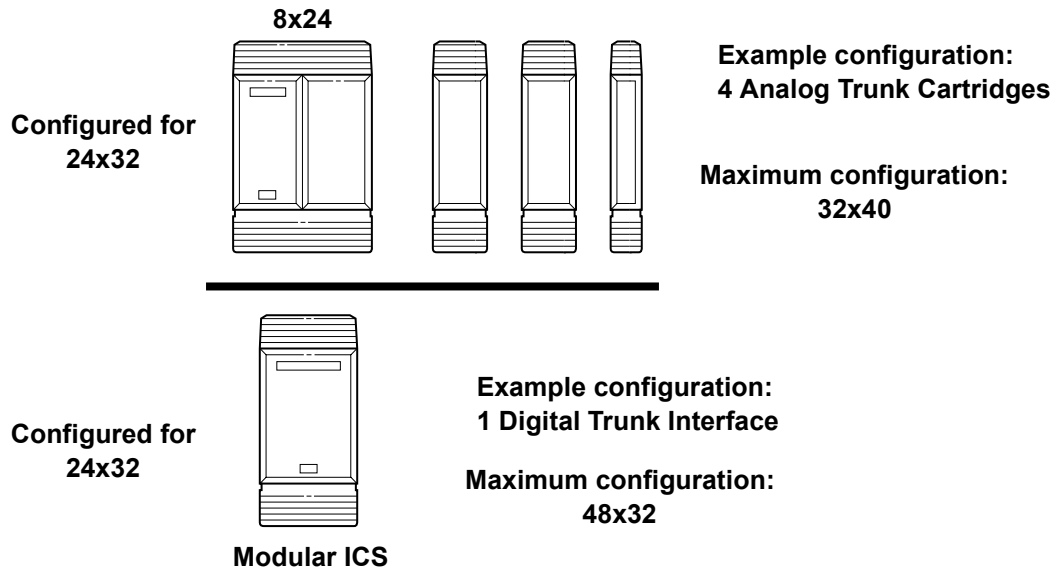
Because no T1 is implemented, the core ICS will support the same 8 trunks as on the 8X24.

The increase in this scenario is the additional 8 station ports on the core unit.

Items to be ordered to complete this upgrade are:

- 1 Modular ICS core,
- 1 Software Feature Cartridge,
- 1 Modular ICS Copper 6-port Expansion Cartridge,
- 2 Trunk Cartridges (either CI or LS/DS) dependent upon customer requirement.

Analog to Digital 8X24 to Modular ICS upgrade with T1



This upgrade shows how much equipment is needed when upgrading to an ICS with T1.

Because the ICS offers an increase of 8 station ports on the core unit, the additional Station Module is no longer needed.

Also, with T1 connectivity, the core ICS will support up to 48 trunks, alleviating the need for the 2 additional trunk modules.

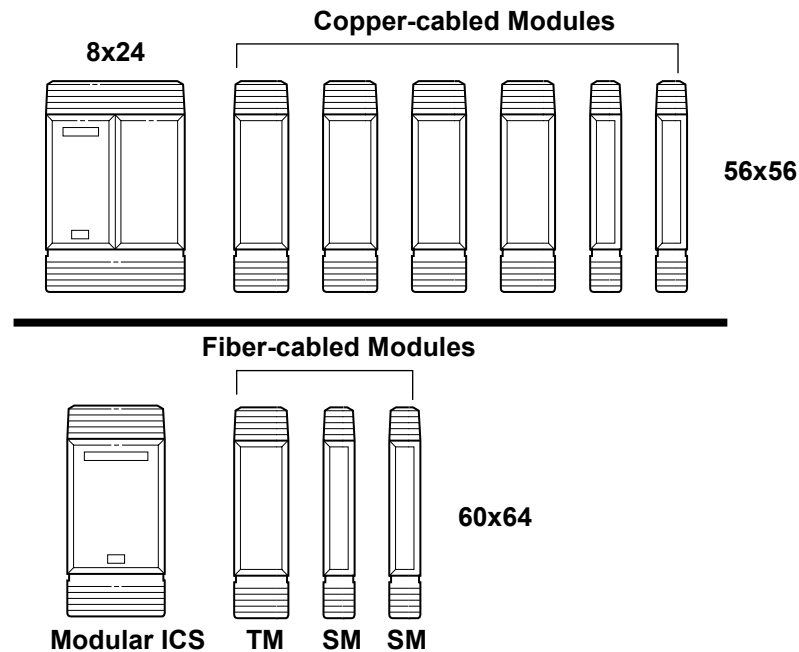
This upgrade streamlines the equipment requirements while providing increased functionality.

Items to be ordered to complete this upgrade are:

- 1 Modular ICS core,
- 1 Software Feature Cartridge,
- 1 DTI Cartridge (24 trunks),
- 1 Services Cartridge.

See Chapter 2 for information about Modular ICS with ISDN BRI functionality.

Analog to Mixed Digital/Analog 8X24 to Modular ICS upgrade with T1, TMs and SMs



This last scenario shows a mixed analog/digital upgrade.

The 8x24 will support 8 trunks only. The 4 Trunk Modules must support the additional 48 trunks for a total of 56 trunks.

Because of the new mixed configuration capability, the core Modular ICS can support 48 digital trunks (2 T1 trunks). One Fiber Trunk Module will support 8 additional analog trunks for a total of 56. In fact, the Fiber Trunk Module can grow another 4 trunks for a total of 60 trunks.

The core Modular ICS supports 32 stations. Two Fiber Station Modules support the additional 32 stations, for a total of 64 stations. Therefore, the Modular ICS with only 1 Fiber Trunk Module and 2 Fiber Station Modules will deliver more capacity than the Modular 8x24 with 4 Copper Trunk Modules and 2 Copper Station Modules.

Items to be ordered in this upgrade are:

- 1 Modular ICS core,
- 1 Software Feature Cartridge,
- 2 DTI Cartridges (24 trunks each),
- 1 Services Cartridge,
- 1 6-port Fiber Expansion Cartridge,
- 1 Fiber Trunk Module,
- 2 Fiber Station Modules.

The existing Analog Trunk Cartridges can be used in the Fiber Trunk Module. All telephone sets can be carried forward.

Modular 8X24 Cartridges

- Expansion Cartridges provide the connection point for expansion of the system via trunk or station modules.
- Services Cartridges contain the clocking services to support T1.
- Trunk Cartridges connect the Norstar system with the central office.

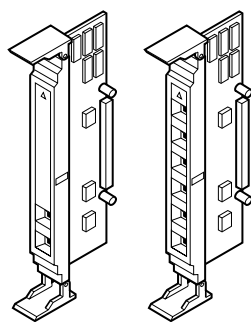
Norstar Module/Cartridge Compatibility

Cartridges	Modular 8X24	
	KSU	Copper Trunk Module
8X24 Copper Expansion 2-port	√	
8X24 Copper Expansion 6-port	√	
LS/DS Analog Trunk (with Disconnect Supervision)*		√
Caller ID Trunk Cartridge*		√
E&M/DISA Trunk Cartridge**		√
DID Trunk Cartridge**		√
1A2 Trunk Cartridge**		√

* Compatible with Modular ICS core and Trunk Modules.

** Compatible with Modular ICS Trunk Modules only.

Modular 8X24 Copper Expansion Cartridge



2-port Copper 6-port Copper

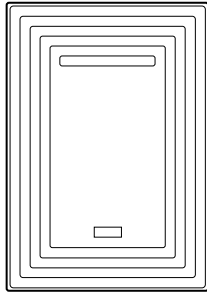
Description

- Two- or six-port Copper Expansion Cartridges connect additional Trunk or Station Modules to expand base system capacity of the Modular 8X24.
- Compatible with the core 8X24 KSU only.

StarTalk Voice Mail Systems

All StarTalk voice mail models have been market retired.

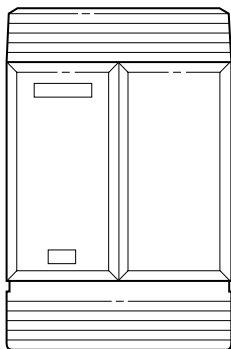
StarTalk Mini



Length: 516 mm (20.3 in)
 Width: 356 mm (14 in)
 Depth: 87 mm (3.4 in)
 Weight: 5.15 kg (11.41 lb)
 Color: Dolphin Grey

- StarTalk Mini is the smaller legacy voice mail system. It provides 2 ports and 90 minutes of storage for up to 24 users and is not expandable. This voice messaging system is clearly identified on the outside cover of the unit.

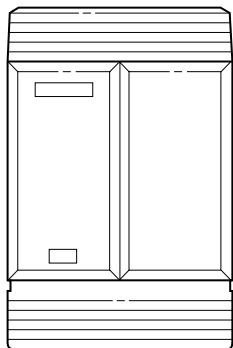
StarTalk A (110 or 165)



Length: 47 cm (18.5 in)
 Width: 38 cm (15 in)
 Depth: 18.4 cm (7.25 in)
 Weight: 10 kg (22 lbs)
 Color: Dolphin Grey

- StarTalk is the larger legacy voice mail system. There are three models of StarTalk. The differences in the models are the hard drive or message storage capacity and the port and channel configurations.
- Model A's hard drive provides 110 or 165 minutes of storage and can support up to 25 users. It provides 1 port (2 channels), with the ability to upgrade to a Model B.
- To tell Model A from the other StarTalk models, open the cover. Model A has one RJ11 connector.

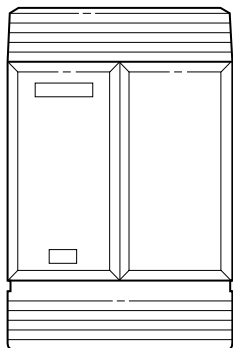
StarTalk B (165 or 330)



Length: 47 cm (18.5 in)
Width: 38 cm (15 in)
Depth: 18.4 cm (7.25 in)
Weight: 10 kg (22 lbs)
Color: Dolphin Grey

- Model B's hard drive provides 165 or 330 minutes of storage and can support up to 50 users. It has 2 ports (4 channels) and is not expandable.
- Model B has two RJ11 connectors and no floppy disk drive.

StarTalk C (385 or 550)



Length: 49.5 cm (19.5 in)
Width: 41.9 cm (16.5 in)
Depth: 19.7 cm (7.75 in)
Weight: 18.6 kg (41 lbs)
Color: Dolphin Grey

- Model C's hard drive provides 385 or 550 minutes of storage for 50 plus users to a maximum Norstar station configuration. It has 2 ports (4 channels) and can be expanded to 8 channels.
- Model C has a built-in 5.25 inch floppy disk drive on the lower left side.
- The obvious difference between Model C and the other StarTalk models, is the floppy disk drive. Model C could have two or four RJ11 connectors.

Appendix B: Norstar Compatibility Matrix

This Compatibility Matrix is intended for reference purposes only. Please consult your local technical source for detailed specifications and ordering information.

Norstar Compatibility Matrix: Release 1.0 - 4.1

ICS Software Version Number	4.1/4.1.1	4.0	3.0	2.0	1.1	1.0
ICS software						
Products	MICS ¹ USA XC ¹ CDA XC ¹ CICS ¹	MICS ¹ USA XC ¹ CDA XC ¹ CICS ¹	MICS USA XC CDA XC	MICS USA XC CDA XC CICS	MICS USA XC CDA XC/XL CICS	MICS R1T1 Centrex USA XL CDA XC/XL
M7100	Yes	Yes	Yes	Yes	Yes	Yes
M7208, M7310	Yes	Yes	Yes	Yes	Yes	Yes
M7324 (including CAP)	Yes	Yes	Yes	Yes	Yes	Yes
Audio Conferencing Unit	Yes	Yes	Yes	Yes	Yes	Yes
Doorphone	Yes	Yes	Yes	Yes	Yes	Yes
C3020	MICS XC	MICS XC	MICS XC	MICS XC	MICS XC	CDA XC
C3050	MICS XC	MICS XC	MICS XC	MICS XC	MICS XC	CDA XC
C3060	MICS XC	MICS XC	MICS XC	MICS XC	MICS XC	CDA XC
PCIB and Norlink/Teledaptor			Yes	Yes	Yes	Yes
Station Message Detail Recording (SMDR)	SMDR 6 ¹	SMDR 6 ¹	SMDR 5	SMDR 5	SMDR 4	SMDR 4
Voice Mail Interface (VMI)	Yes	Yes	Yes	Yes	Yes	Yes
Analog Converters	ATA2	ATA2	ATA2	EATA	EATA	EATA
Features available to analog users vary for each software release.						
Analog Station Module (Fiber interface)	MICS	MICS	MICS	MICS	MICS	
CTA 100	Yes	Yes	Yes	Yes	Yes	Yes
CTA 160i	Yes	Yes	Yes	Yes	Yes	Yes
CTA 200	Yes	Yes	Yes	Yes	Yes	Yes
Norstar Data Interface	Yes					
TAPI 1.0			Yes ³	Yes ³	Yes ³	Yes ³
TSAPI					Yes ³	Yes ³
TSP 2.0		Yes ¹	Yes ³	Yes ³	Yes ³	Yes ³
TSP 2.1	Yes	Yes	Yes	Yes	Yes	Yes
Personal Call Manager (95/98/NT)		Yes	Yes	Yes	Yes	Yes
PC Console (95/98/NT)	1.2	1.1 ¹	1.0	1.0	1.0	1.0
RAD					Yes	Yes
RAD 2 (RSD)			Yes	Yes	Yes	Yes
FastRAD	Yes	Yes ⁴	Yes	Yes	Yes	Yes
FastRAD 2	Yes	Yes	Yes	Yes	Yes	Yes
<p>Note 1: When upgrading the ICS software to MICS 4.0 and higher, please ensure all applications indicated are upgraded to the appropriate level before contacting technical support.</p> <p>Note 2: Minimum release of 6x16 (NT5B10CF RIs 02 English/French, NT5B10DF RIs 02 English/Spanish), 6x16 DS (NT5B10CE RIs 04 English/French, NT5B10DE RIs 04 English/Spanish), 8x24 (NT5B24CH RIs 04 English/French, NT5B24DH RIs 04 English/Spanish), 3x8 (NT5B05CJ RIs 01A English/French, NT5B05DA RIs 01C English/Spanish), 8x24 CTX (NT5B29CE RIs 02 English/French, NT5B29DD RIs 02 English/Spanish).</p> <p>Note 3: Centrex KSU software is not supported on any desktop integration hardware.</p> <p>Note 4: Firmware Upload required for MICS 4.0 and higher. Visit the Nortel Networks, ITAS web site.</p> <p>Note 5: CICS 1.0 is only compatible with Remote Set.</p> <p>Note 6: Voice Mail upgrades MUST be completed before upgrading ICS software. Norstar Voice Mail 3.0 will not boot-up on Modular ICS 4.0 and higher.</p>						

Norstar Compatibility Matrix: Release 1.0 - 4.1 continued...

ICS Software Version Number	4.1	4.0	3.0	2.0	1.1	1.0
ICS software	MICS ¹ USA XC ¹ CDA XC ¹ CICS ¹	MICS ¹ USA XC ¹ CDA XC ¹ CICS ¹	MICS USA XC CDA XC	MICS USA XC CDA XC CICS	MICS USA XC CDA XC/XL CICS	MICS R1T1 Centrex USA XL CDA XC/XL
Products						
Norstar Remote Utilities (minimum versions required for features)						
Manager (On-Line programming)					Rel 3.0 ⁵	Rel 2.0
Remote Set (RAD2, FastRAD)	Yes	Yes	Yes	Yes	Yes	Yes
Back Up and Restore	NRU 8.1	NRU 8	NRU 7	NRU 4		
Browser	NRU 8.1	NRU 8	NRU 7	NRU 4		
Off-Line Programming	NRU 8.1	NRU 8	NRU 7	NRU 7		
Cyber Monitor (IDM Tool)	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5
QuickSet (IDM Tool)	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5
Norstar Voice Mail	4.0	4.0 ^{1,6}	3.0	2.1	2.0	1.0
Dial-by-Name	1.3	1.3 ^{1,6}	1.21	1.2	1.0	1.0
ACD - Co-resident	3.3 or higher	3.1 ^{1,6}	3.0	3.0	3.0	3.0
ACD - MINUET	1.1 or higher	1.1 ^{1,6,7}	1.0 ⁷	1.0 ⁷	1.0 ⁷	1.0 ⁷
ACD (Cintech - Stand Alone)	3.3 or higher	3.1 ¹	3.0	2.00.19	2.00.15	2.00.11
Flash Voice Mail	1.9 or higher	1.9 ¹	1.5	1.5	1.44	1.44
Flash Voice Mail Light	Yes	Yes	Yes	Yes	Yes	Yes
Flash ACD	1.9 or higher	1.1 ¹	1.0	1.0	1.0	
MS-BIC (MICS or DS30 Adapter)	Yes	Yes	Yes	Yes	Yes	Yes
DS30 Station Port Adapter	Yes	Yes	Yes	Yes	Yes	Yes
<p>Note 1: When upgrading the ICS software to MICS 4.0 and higher, please ensure all applications indicated are upgraded to the appropriate level before contacting technical support.</p> <p>Note 2: Minimum release of 6x16 (NT5B10CF RIs 02 English/French, NT5B10DF RIs 02 English/Spanish), 6x16 DS (NT5B10CE RIs 04 English/French, NT5B10DE RIs 04 English/Spanish), 8x24 (NT5B24CH RIs 04 English/French, NT5B24DH RIs 04 English/Spanish), 3x8 (NT5B05CJ RIs 01A English/French, NT5B05DA RIs 01C English/Spanish), 8x24 CTX (NT5B29CE RIs 02 English/French, NT5B29DD RIs 02 English/Spanish).</p> <p>Note 3: Centrex KSU software is not supported on any desktop integration hardware.</p> <p>Note 4: Firmware Upload required for MICS 4.0 and higher. Visit the Nortel Networks, ITAS web site.</p> <p>Note 5: CICS 1.0 is only compatible with Remote Set.</p> <p>Note 6: Voice Mail upgrades MUST be completed before upgrading ICS software. Norstar Voice Mail 3.0 will not boot-up on Modular ICS 4.0 and higher.</p> <p>Note 7: MINUET 1.1 is compatible with Norstar Voice Mail 4.0 and MINUET 1.0 is compatible with Norstar Voice Mail 3.0 only.</p>						

Norstar Compatibility Matrix: DR 1 - DR 5

ICS Software Version Number	DR5 ²	DR4	DR3	DR2	DR1
Products	Com 6x16 Mod 8x24 Com 3x8 Com 6x16 DS Centrex+	Mod 8x24	Mod 8x24 Centrex	Com 6x16 Mod 8x24	Com 6x16 Mod 8x24
M7100	Yes	Yes	Yes		
M7208, M7310	Yes	Yes	Yes	Yes	Yes
M7324 (including CAP)	Yes	Yes	Yes	Modular	
Audio Conferencing Unit	Yes	Yes	Yes		
Doorphone	Yes	Yes	Yes	Yes	Yes
C3020					
C3050					
C3060					
CI C6	Compact				
CI M8	Modular				
Station Message Detail Recording (SMDR)	SMDR 3	SMDR 3	SMDR 2	SMDR 2	SMDR 1
Voice Mail Interface (VMI)	Yes	Yes	Yes	Yes	Yes
Analog Converters	ATA	ATA	ATA	ATA	ATA
Minimum hardware level shown here for ATA. ATA2 is not compatible with DR1. Features available to analog users vary for each software release.					
Analog Station Module (Fiber interface)					
CTA 100	Yes ²				
CTA 160i	Yes ²				
CTA 200					
TAPI 1.0	Yes ^{2, 3}				
TSAPI	Yes ^{2, 3}				
TSP 2.0	Yes ^{2, 3}				
TSP 2.1	Yes				
Personal Call Manager (95/98/NT)	Yes ²				
PC Console (95/98/NT)					
<p>Note 1: When upgrading the ICS software to MICS 4.0 and higher, please ensure all applications indicated are upgraded to the appropriate level before contacting technical support.</p> <p>Note 2: Minimum release of 6x16 (NT5B10CF Rls 02 English/French, NT5B10DF Rls 02 English/Spanish), 6x16 DS (NT5B10CE Rls 04 English/French, NT5B10DE Rls 04 English/Spanish), 8x24 (NT5B24CH Rls 04 English/French, NT5B24DH Rls 04 English/Spanish), 3x8 (NT5.B05CJ Rls 01A English/French, NT5B05DA Rls 01C English/Spanish), 8x24 CTX (NT5B29CE Rls 02 English/French, NT5B29DD Rls 02 English/Spanish).</p> <p>Note 3: Centrex ICS software is not supported on any desktop integration hardware.</p> <p>Note 4: Firmware Upload required for MICS 4.0. and higher. Visit the Nortel Networks, ITAS web site.</p> <p>Note 5: CICS 1.0 is only compatible with Remote Set.</p> <p>Note 6: Voice Mail upgrades MUST be completed before upgrading ICS software. Norstar Voice Mail 3.0 will not boot-up on Modular ICS 4.0 and higher.</p>					

Norstar Compatibility Matrix: DR1 - DR5 continued...

ICS Software Version Number	DR5 ²	DR4	DR3	DR2	DR1
Products	Com 6x16 Mod 8x24 Com 3x8 Com 6x16 DS Centrex+	Mod 8x24	Mod 8x24 Centrex	Com 6x16 Mod 8x24	Com 6x16 Mod 8x24
RAD	Yes ²	Yes	Yes	Yes	Yes
RAD 2 (RSD)	Yes ²	Yes	Yes	Yes	
FastRAD	Yes ²	Yes	Yes	Yes	
FastRAD 2	Yes ²	Yes	Yes	Yes	
Norstar Remote Utilities (minimum versions required for features)					
Manager (On-Line programming)	Rel 1.0 ²				
Remote Set (RAD2, FastRAD)	Yes	Yes	Yes	Yes	
Back Up and Restore					
Browser					
Off-Line Programming					
Cyber Monitor (IDM Tool)	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5
QuickSet (IDM Tool)	NRU 5	NRU 5	NRU 5	NRU 5	NRU 5
Norstar Voice Mail	1.0 ²				
Dial-by-Name	1.0 ²				
ACD - Co-resident	3.0 ²				
ACD - MINUET	1.0 ^{2, 7}				
ACD (Cintech - Stand Alone)	2.00.11 ²				
Flash Voice Mail	<1.35 ²				
Flash ACD	Yes ²				
MS-BIC (MICS or DS30 Adapter)	Yes ²				
DS30 Station Port Adapter	Yes ²				
<p>Note 1: When upgrading the ICS software to MICS 4.0 and higher, please ensure all applications indicated are upgraded to the appropriate level before contacting technical support.</p> <p>Note 2: Minimum release of 6x16 (NT5B10CF Rls 02 English/French, NT5B10DF Rls 02 English/Spanish), 6x16 DS (NT5B10CE Rls 04 English/French, NT5B10DE Rls 04 English/Spanish), 8x24 (NT5B24CH Rls 04 English/French, NT5B24DH Rls 04 English/Spanish), 3x8 (NT5B05CJ Rls 01A English/French, NT5B05DA Rls 01C English/Spanish), 8x24 CTX (NT5B29CE Rls 02 English/French, NT5B29DD Rls 02 English/Spanish).</p> <p>Note 3: Centrex ICS software is not supported on any desktop integration hardware.</p> <p>Note 4: Firmware Upload required for MICS 4.0 and higher. Visit the Nortel Networks, ITAS web site.</p> <p>Note 5: CICS 1.0 is only compatible with Remote Set.</p> <p>Note 6: Voice Mail upgrades MUST be completed before upgrading ICS software. Norstar Voice Mail 3.0 will not boot-up on Modular ICS 4.0 and higher.</p> <p>Note 7: MINUET 1.1 is compatible with Norstar Voice Mail 4.0 and MINUET 1.0 is compatible with Norstar Voice Mail 3.0 only.</p>					

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Note: The Release 7.1 edition of the Norstar Handbook uses two-level numbering, that is, chapter number followed by page number. For example, 2 - 6 refers to Chapter 2 - page 6, A-7 refers to Appendix A - page 7, etc.

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