TECHNICAL Practice

TELECOM SOLUTIONS FOR THE 21ST CENTURY

ES-3

Entry System Door Controller

September 27, 2002

Add Up To 32 Access Entry Points To Vikings Accessible Entry System

Up to 32 additional points of entry may be added to **Viking**'s model **AES-2000** Accessible Entry System by adding the optional **AES-NET** board. One **ES-3**, one Wiegand device and a door strike or magnetic lock of your choice is required for each additional entry point.

The **ES-3** is an entry system door controller designed to operate a door strike or magnetic lock upon receiving a valid card read from a Wiegand device. The Wiegand device used may be the **Viking** model **HID-1** Proximity Card Reader or any other card reader, RF transmitter or digital keypad that outputs the 26 bit Wiegand format. Up to 525 valid Wiegand codes can be programmed into the **AES-2000**, and up to 1024 access entry events are logged and stored in the **AES-2000**. Other programmable parameters, like relay activation and delay times, are also PC programmed via the **AES-2000**.

Only one pair of wires are needed to wire all 32 Entry System Door Controllers back to the **AES-2000**. This two wire CAN communication protocol allows the **ES-3** to be installed up to 1 mile away. Power to the **ES-3** can also be daisy chained from unit to unit on a single pair of wires, or simply tap into the local door strike's power supply. A door sensor input monitors for a forced door or door ajar condition. A Request to Exit input operates the doors for people leaving the controlled area. Three separate relay outputs allow control of Door Strikes, Magnetic Locks, Gate Opener, Lights, Camera and or Alarm.

Features

- Up to 525 tenants
- Up to 32 entry points are possible
- logs up to 1024 entry events
- Two wire CAN communication protocol can be daisy-chaines together
- Share with door strike's 12-24 Volt AC or DC power source
- Inputs may be either normally open (NO) or normally closed (NC) contacts
- Relay outputs may provide either normally open (NO) or normally closed (NC) contacts

Applications

- High rise apartment buildings
- Condos
- Senior citizen buildings
- Assisted care centers
- Retirement homes
- Gated communities

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Specifications

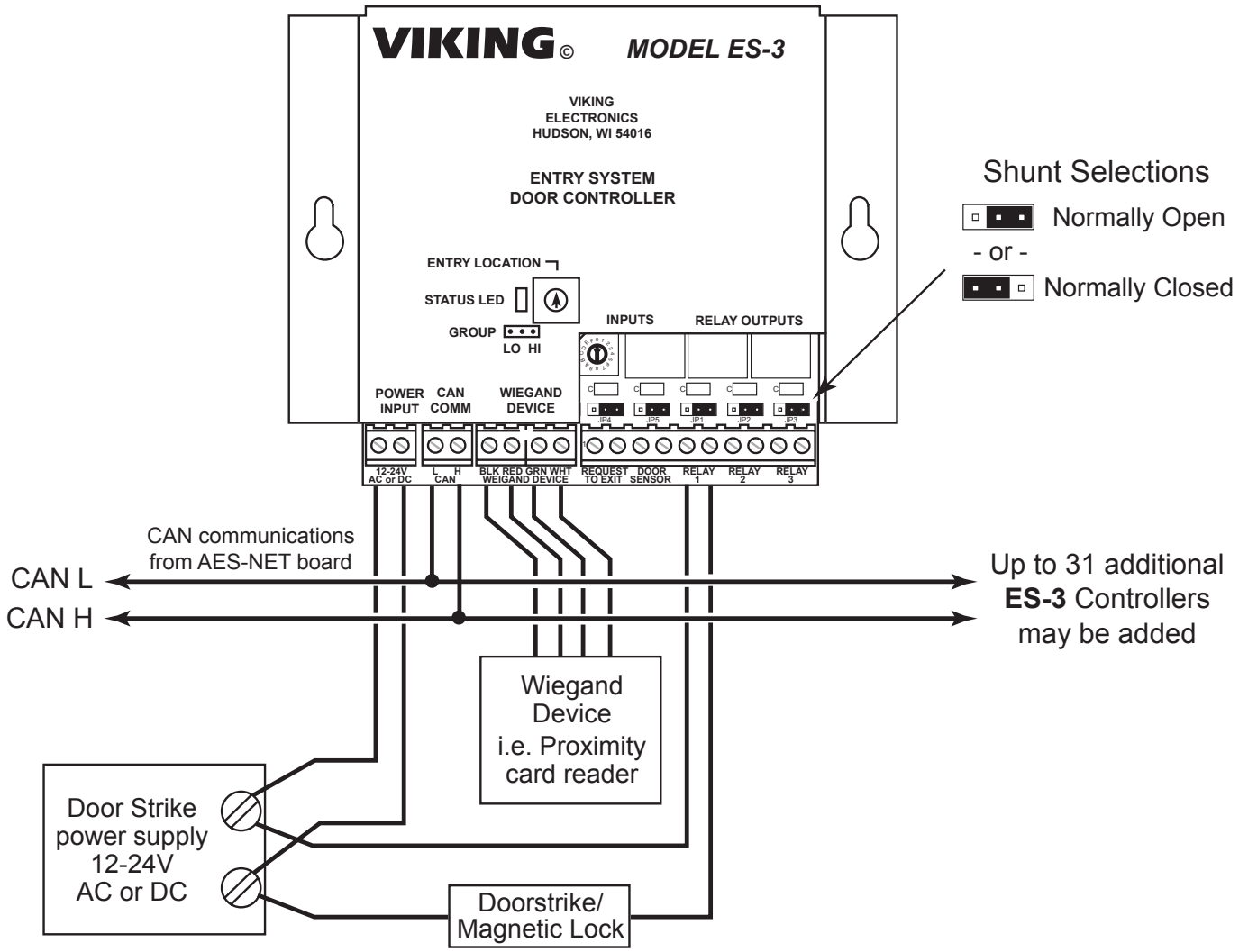
Power: Any 12-24 Volt AC or DC source @ 300mA (not included) (Designed to share power with the local door strike's power supply)
Dimensions: 133mm x 89mm x 44mm (5.25" x 3.5" x 1.75")
Shipping Weight: 1.3 kg (3 lbs)
Environmental: 0° C to 32° C (32° F to 90° F) with 5% to 95% non-condensing humidity
Relay Contact Ratings: 3A @ 30V DC/250V AC maximum
Connections: 18 screw terminals
Max CAN Length: 0.8 Km (2600 ft) - 24 AWG twisted pair, 1.6 Km, (5300 ft) - using 2 pairs of 24 AWG twisted pair
Max Wiegand Length: 183 m (500 ft) - 24 AWG

Definitions

CAN Communications: A highly reliable two wire communication protocol originally developed for the automotive industry.
Entry Point: A door or gate allowing access into a secure or controlled area.
Forced Door Condition: The door sensor input shows that the door has opened, without the **ES-3** allowing for access.
Door is Ajar Condition: The door sensor input shows that the door remained open longer than a programmed amount of time.
26 bit Wiegand Format: The industry standard data output protocol of access control card readers.

Installation

A. Basic Connections



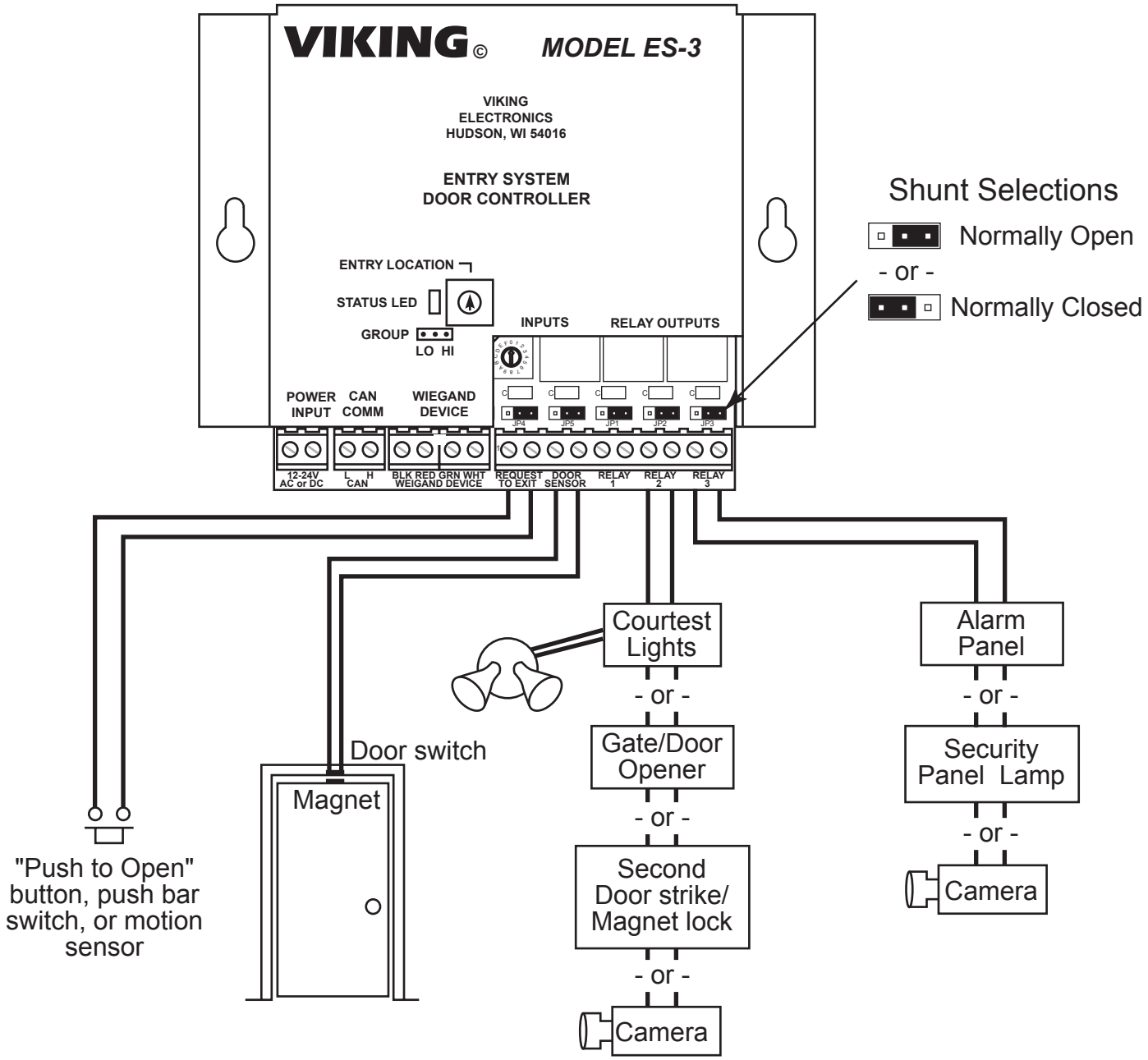
A basic door access controlled entry point is wired as shown above. The **ES-3** may share power with the attached door strike or magnetic lock if the Voltage is between 12-24 Volts and an additional 300 mA of current is available.

Relays can be set as either Normally Open (NO), or Normally Closed (NC) using the shunt located directly behind the relay screw terminals.

The Wiegand device (typically a proximity card reader) is fully supported (power and data) from the **ES-3** and can be installed up to 500 feet away using 24 gauge wire.

The **ES-3** communicates with the **AES-2000** through the **AES-NET** board via a two wire CAN Communication Bus. CAN bus distances of up to 1/2 a mile (over 2600 feet) are achieved using common 24 gauge CAT-2 through CAT-5 wire, and 1 mile (5280 feet) is possible by doubling up on the 24 gauge twisted pair. In addition, up to 32 **ES-3** entry system door controllers may share the same CAN communication pair.

B. Advanced Features



The **ES-3** can be wired with either a normally open or a normally closed Door Sensor switch by setting the shunt located directly behind the Door Sensor screw terminals to either Normally Open (NO), or Normally Closed (NC).

The **ES-3** can be wired with either a normally open or a normally closed Request to exit device switch by setting the shunt located directly behind the Request to Exit screw terminals to either Normally Open (NO), or Normally Closed (NC).

Relay 2 can provide either a Normally Open (NO), or Normally Closed (NC) contacts to control a courtesy light, a gate/door opener, a second door strike/magnetic lock, or start a camera. Use the shunt located directly behind the relay screw terminals to set the normal state.

Relay 3 can provide either a Normally Open (NO), or Normally Closed (NC) contacts to trigger an alarm,activate a security panel lamp, or start a camera. Use the shunt located directly behind the relay screw terminals to set the normal state.

Programming

A. Assignment

Each **ES-3** (up to 32 total) must be assigned with its own unique entry point location identifier. With the shunt set to Low Group, 16 different rotary switch positions are available. After these 16 have been used, set the remaining units to the High Group for 16 more settings using the same rotary switch.

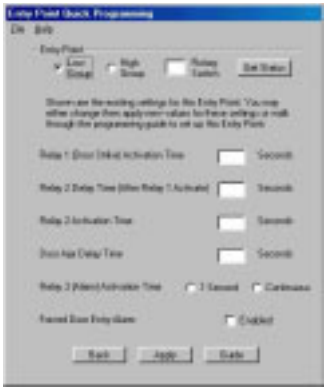
IMPORTANT: Do NOT set group shunts and rotary switches until the entire system is wired and powered up.

If an **ES-3** is installed with a duplicate entry point location identifier, the Status LED will flash. Simply move the shunt/rotary switch to a new position. The Status LED will momentarily go off, then come on steady to show it has its own unique entry point location identifier.

B. ES-3

Each **ES-3** and all valid card numbers must be programmed in the system for proper operation. This programming is done through the telephone line interface of the **AES-2000** using the **PB-100** with special software. This allows either remote programming from a distant location, or local programming using the Viking **DLE-300** line simulator. The **PB-100** is connected to a serial port of a P.C. and Windows based software is used to enter relay activation times and alarm conditions for each **ES-3** and the valid card numbers in the **AES-2000** data base.

Access the Remote Programmer software as described in the **AES-2000** Technical Practice. Proceed through the "Building Selection", "Apartment Selection", and "Security Code" screens until the "Data Transmit" screen appears. Then click the "Entry Points" button and the "Entry Point Quick Programming" screen will appear as shown to the right. To start, select whether the **ES-3** to be programmed is a low or high group (shunt selectable), enter the rotary switch position, and click "Get Status".



If a "Network Error" is given, check that the Group Shunt and Rotary Switch assignment match an actual installed **ES-3**, the **ES-3** being programmed is powered up, and the CAN bus connections are polarity correct (H & L). When all is OK, the existing parameters such as relay activation times and alarm conditions will appear. New values may be entered and applied, or click the "Guide" button to walk through detailed programming instructions in the software itself.

After one **ES-3** is programmed, select the next **ES-3** to be programmed and continue until all entry points have been programmed.

C. Access Cards

26 bit Wiegand Access Cards, such as the HID Proximity Card, identify themselves with a six digit number. The first two digits are considered the Facility Code, and the last four digits are the Card Number. When programming the **AES-2000**, enter this unique six digit number as the "Keyless Entry Code" for the person the card will be issued.

There are several limitations on the numbers used when the cards are programmed. The Facility code must be in the range from 00-99. Numbers below 10 are generally used for demonstration purposes and should not be used. The card numbers can range from 0000 to 9999. Once again, numbers below 1000 are for demonstration and should be avoided. When entering the card number in the Keyless Entry Code box of the Apartment Select screen, the length of the code must always be 6 digits.

For example: If the facility code is **9** and the card number is **23**, then the programmed number "**090023**" must be entered into the Keyless Entry Code Box for the given apartment.

Operation

The **ES-3** Entry System Access Controller monitors the Wiegand device (ie. proximity card reader) for 26 bit Wiegand data. When data is received, it is converted into CAN data and sent (up to 2000 feet away) to the AES-NET board through the shared CAN two wire pair. The **AES-2000** compares the data against its programmed data base and communicates back to the originating **ES-3** whether access is granted or not. If access is granted, Relay 1 and Relay 2 will activate per their programmed delay and activation times. The Entry Point Location, time, and Card Number will all be logged in the **AES-2000**. Relay 1 operates first and should be used to operate the door strike or magnetic lock. Relay 2 can be delayed from Relay 1 to operate a gate / door opener, or a second door strike or magnetic lock for double entrance doors. Relay 2 may also be programmed with longer times to operate courtesy lights or a camera.

If a "Push to Open" button, push bar switch, or motion sensor activates the Request to Exit input of the **ES-3**, the relays will activate the same as if access is granted. No data is logged on a Request to Exit event.

If a door sensor switch is wired to the Door Sensor input of the **ES-3** and the door remains open longer than the programmed Door is Ajar timer, Relay 3 will activate for either 1 second or until the door closes (programmable). This can be used to set an alarm, light a security panel lamp, turn on a camera, etc.

If both a request to exit device and a door sensor switch are used, a Forced Door alarm condition may be selected. If the door is opened other than by the **ES-3**, Relay 3 will activate for either 1 second or until the door closes (programmable).

LED's are provided for the 2 inputs and the 3 relay outputs. Each LED is located behind its associated screw terminals. The LEDs will remain off showing the idle state, and turn on when its associated input/output is triggered/activated.