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USA

EDGE EVO®

Standard Networked Controller

EH400-K

INSTALLATION GUIDE

82000-921, Rev C.0

October 2011

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EDGE EVO is the next evolution in access control hardware solutions. A true IP solution that meets the demands of open architecture, IP-centric environments, EDGE EVO provides fully distributed intelligence and decision making right to the door, leveraging the IT infrastructure to the maximum extent possible. Leveraging Power-over-Ethernet (PoE), EDGE EVO reduces door installation costs by not requiring a separate local power supply under many circumstances.

The Standard Networked Controller is a fully integrated single-door controller offering discrete I/O and Wiegand/Clock-and-Data interfaces to readers. Additionally, connect native Hi-O devices (readers, locks, pushbuttons) and EDGE EVO Hi-O Modules to the Hi-O bus, providing secure communication around the door. Hi-O involves devices with built-in intelligence and a CANbus that links all the devices together. Password protect or encrypt Hi-O CANbus data traffic. Each Hi-O device (such as the REX switch, electric strike, card reader and door operator) is connected to the CANbus by a single, four-wire cable. Two of the wires supply power and the other two are used for data communication.

Specifications

CONDITIONS			VOLTAGE DC (VDC)	CURRENT (Amp)	OPERATING TEMPERATURE	CABLE LENGTH	UL REF NUMBER
Input	DC Input (NSC)		+12VDC	0.18Amp	32° - 122°F (0° - 50° C)	Hi-O CAN Bus Total Length 100 ft (30 m) - 22 AWG ● 0.65mm ● 0.33mm ² Maximum between drops 30 ft (10 m) 22 AWG ● 0.65mm ● 0.33mm ² RJ45 328 ft (100 m) - Category 5 K	KE400CxNN
			+24VDC	0.14Amp			
			PoE (+48VDC NOM)	.085Amp			
	DC Input (MAX)		+12VDC	1.5Amp			
			+24VDC	1.5Amp			
			PoE +48VDC (NOM)	0.3Amp			
Output	Supervised inputs (AC, Batt, REX, Door Mon) (MAX)		0-+5VDC Reference	0.005Amp (sink)			
	Data 1/CLK , Data 0 / Data (MAX)		0-+5VDC Reference	N/A			
	GRN LED, RED LED, Beep, Hold (MAX)		0-+5VDC reference	0.005Amp (sink)			
	External Tamper (MAX)		+5VDC (NOM)	0.02			
	CAN DC Output (MAX)	AUX 12 / 24VDC Input	+10.8 to +24VDC	1.2Amp *			
		PoE Input	+ 24VDC (NOM)	0.4Amp *			
	Reader DC PWR Output (MAX)	AUX 12 VDC	+9.8 to +12.25VDC	0.32Amp *			
		AUX 24VDC	+9.8 to +12.25VDC	0.60Amp *			
		PoE Input	+9.8 to +12.25VDC	0.58Amp *			
	Strike / AUX Relays NC or NO DC Output (MAX)	AUX 12VDC Input	Unregulated (Wet) Jumpers	+10 to 12VDC			
			Unregulated (Wet) Jumpers	+23 to 24VDC			
		AUX 24VDC Input	Regulated (Wet) Jumpers - 12VDC	+10 to 12VDC			
			Unregulated (Wet) Jumpers	+16.5 to 24VDC			
		PoE Input	Regulated (Wet) Jumpers - 12VDC	+10 to 12VDC			
			Jumpers Set to Dry	+12 to 24VDC External			

NSC = Normal Standby Condition

* Combined output ratings, not to exceed 1.2 Amp

** Each Relay

x =
K for Black
G for Grey

1

Power Analysis

Before starting installation, determine which components will be used in the system and analyze the power requirements to avoid over-loading the EDGE EVO Hi-O Networked Controller & Reader (EH400-K).

The steps that follow illustrate sizing power requirements for the system.

Step 1 - Identify System Components

Identify the components that will be used in the system. A typical installation may include the following components:

- Door Position Switch – Detects when the door is open or closed.
- Magnetic Lock – Holds the door locked.
- Request to Exit (REX) Switch – Unlocks the door when exiting the secured area.
- EDGE EVO Hi-O Standard Networked Controller (EH400-K) – Provides access control and manages all peripherals around the door.
- iCLASS Wiegand Reader – Provides entry into the secured area.

Step 2 - Create System Layout

Using the components identified in “Step 1 - Identify System Components” on page 2, create the system layout.

In this example, the EH400-K is connected to the remote server through an Ethernet connection and manages door peripherals over the Hi-O bus. Controlling downstream door peripherals, the EH400-K is a fully integrated single-door controller offering discrete I/O and Wiegand/Clock-and-Data interfaces to external readers. The EH400-K receives inputs from the Door Position Switch and REX Switch to drive the Magnetic Lock output.

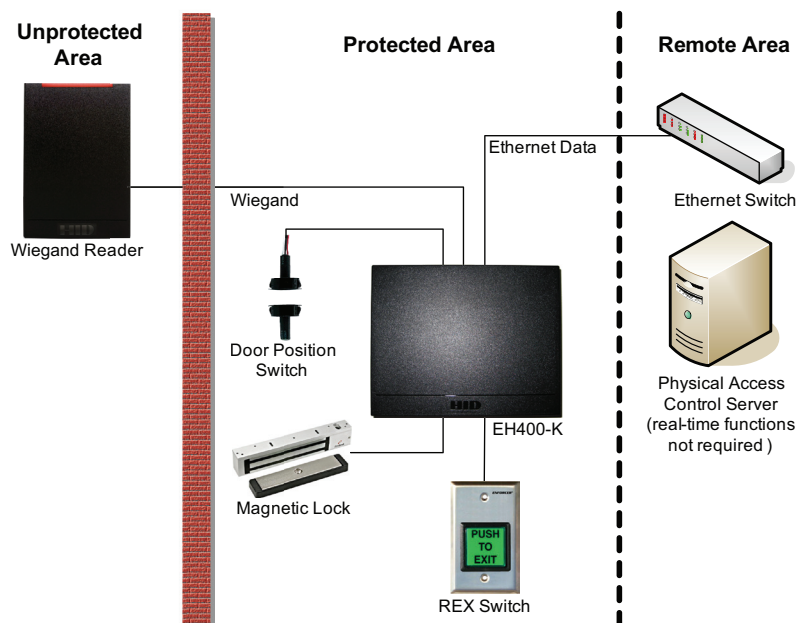


Figure 1 - System Layout Example

Step 3 - Analyze Power Requirements

A - Door Peripheral Operational Currents

For the door peripherals identified in “Step 1 - Identify System Components” on page 2, consult the vendor data sheets to determine the operational current draw. Typical operational current draw is provided below.

Note: See individual peripheral data sheets for actual operational current draw.

Device	Conditions	Typical Operational Current
Door Position Switch (For example, Securitron MSS)	V _{IN} = 12VDC	15mA
	V _{IN} = 24VDC	15mA
Mag Lock (For example, Securitron M32)	V _{IN} = 12VDC	300mA
	V _{IN} = 24VDC	150mA
REX Switch (For example, Securitron EEB)	V _{IN} = 12VDC	28mA
	V _{IN} = 24VDC	38mA
iCLASS Wiegand Reader	V _{IN} = 12VDC	150mA

B - Match I/O Requirements to the Hi-O Interface Device

For the door peripherals identified in “Step 1 - Identify System Components” on page 2, the system requires direct connection to I/O interface and Wiegand/Clock-and-Data ports of the EH400-K. A separate Hi-O Interface Device is not required.

C - Compute and Compare Overall Current Draw

Calculate the total current draw for all door peripherals and the attached Wiegand readers with the following equation, adding terms as required.

$$I_{\text{total}} = I_{\text{dps}} + I_{\text{mag}} + I_{\text{rex}} + \dots + I_{\text{iCLASS reader}}$$

The following calculations provide load current computations.

$$I_{\text{total}} @ 12\text{VDC} = 15\text{mA} + 300\text{mA} + 28\text{mA} + 150\text{mA} = 493\text{mA}$$

$$I_{\text{total}} @ 24\text{VDC} = 15\text{mA} + 150\text{mA} + 38\text{mA} + 150\text{mA} = 353\text{mA}$$

Compare the required current draw (I_{total}) to the output current capacity of the EH400-K (see Specification table, pg 1) to select the EH400-K power scheme. The CAN DC Pwr Output represents the entire power output capacity of the EH400-K.

Device	Port	Conditions	Vout	I out
Standard Networked Controller (EH400-K)	CAN DC PWR Output (MAX)	AUX 12-24VDC Input	+10.8 to +24VDC	1.2A
		PoE input	+24VDC (NOM)	400mA

In this example, the EH400-K provides sufficient power when operated with a PoE injector, or +12/24VDC auxiliary power supplies.

Directly connect the door peripherals identified in “Step 1 - Identify System Components” on page 2 to the EH400-K I/O ports per the “Specifications” on page 1 for the selected input power scheme.

Ensure all door peripherals connected to the Strike/AUX relays and the Reader DC Pwr Output or both do not exceed 1.2Amps (AUX Input) or 0.4Amps (PoE Input), combined. Alternatively, the door peripherals may be connected to the Strike/AUX relays configured for Dry contact up to 2Amps per relay.

EH400-K

The door peripherals identified in “Step 1 - Identify System Components” on page 2 should be directly connected to the I/O ports of the EH400-K. The I/O ports may be configured to provide the following output current capacity.

Device	Ports	Conditions	I out
EDGE EVO Hi-O Standard Network Controller (EH400-K)	Strike / Aux NC or NO DC Output	+12VDC unregulated (@ +12VDC EDM-M input)	600 mA*
		+24VDC unregulated (@ +24VDC EDM-M input)	600 mA*
		+12VDC regulated (@ +24VDC EDM-M input)	3 mA*
	Dry Jumpers	+12VDC to +24VDC External	2.00 Amp**
	Reader Power	+9.8VDC to +12.25 VDC	320-600mA*

* = Combined output ratings, not to exceed 1.2 Amp

** = Each relay

Ensure door peripherals connected to the Strike/AUX relays (regulated/unregulated) do not exceed 1.2 Amps combined. Alternatively, the door peripherals may be connected to the Strike/AUX relays configured for Dry contact up to 2 Amps.

Ensure Wiegand / Clock-and-Data readers attached to the reader port do not exceed:

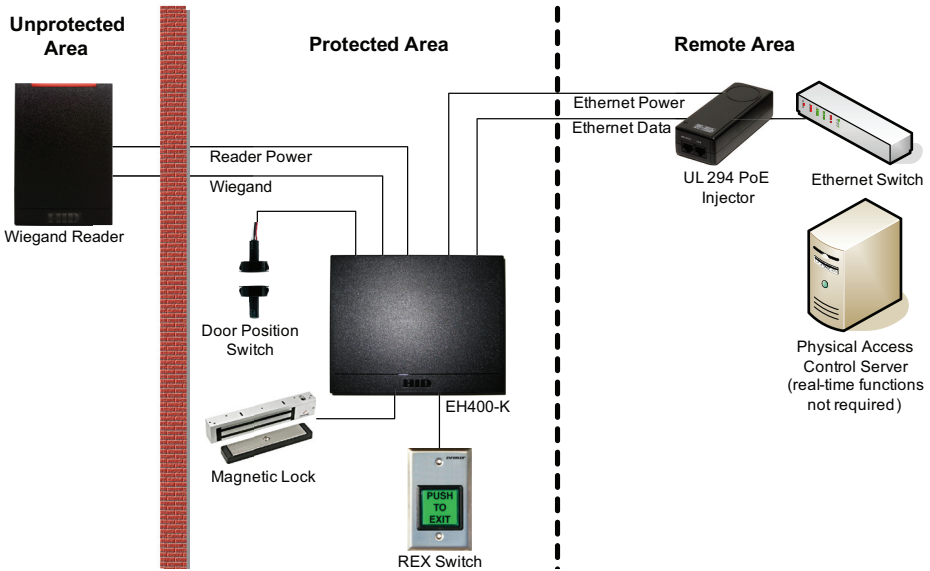
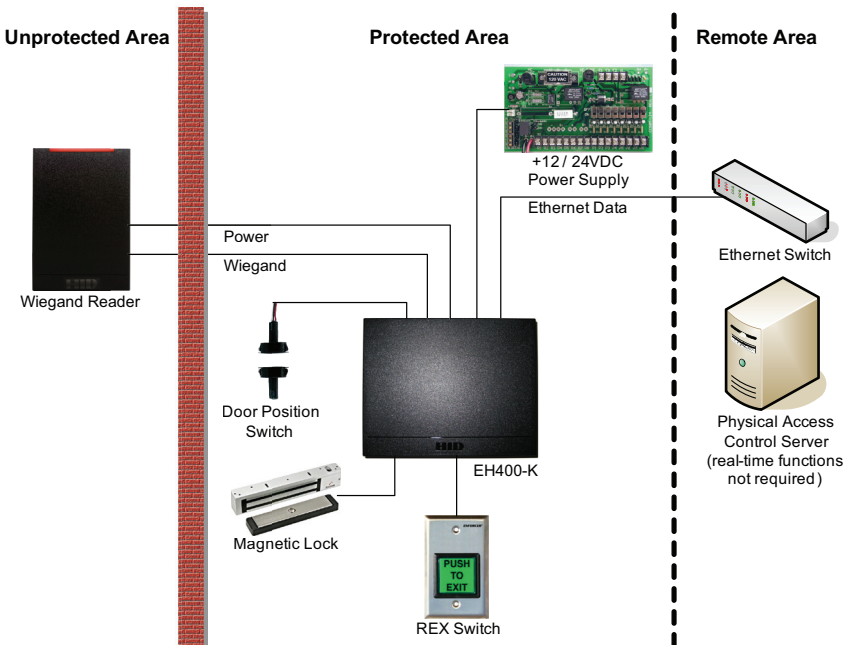
320mA @ +9.8VDC

or

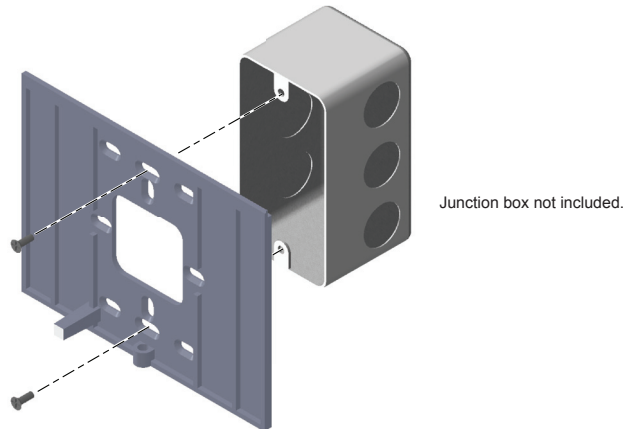
600mA @ +12.25VDC

Step 4 - Select Power Scheme

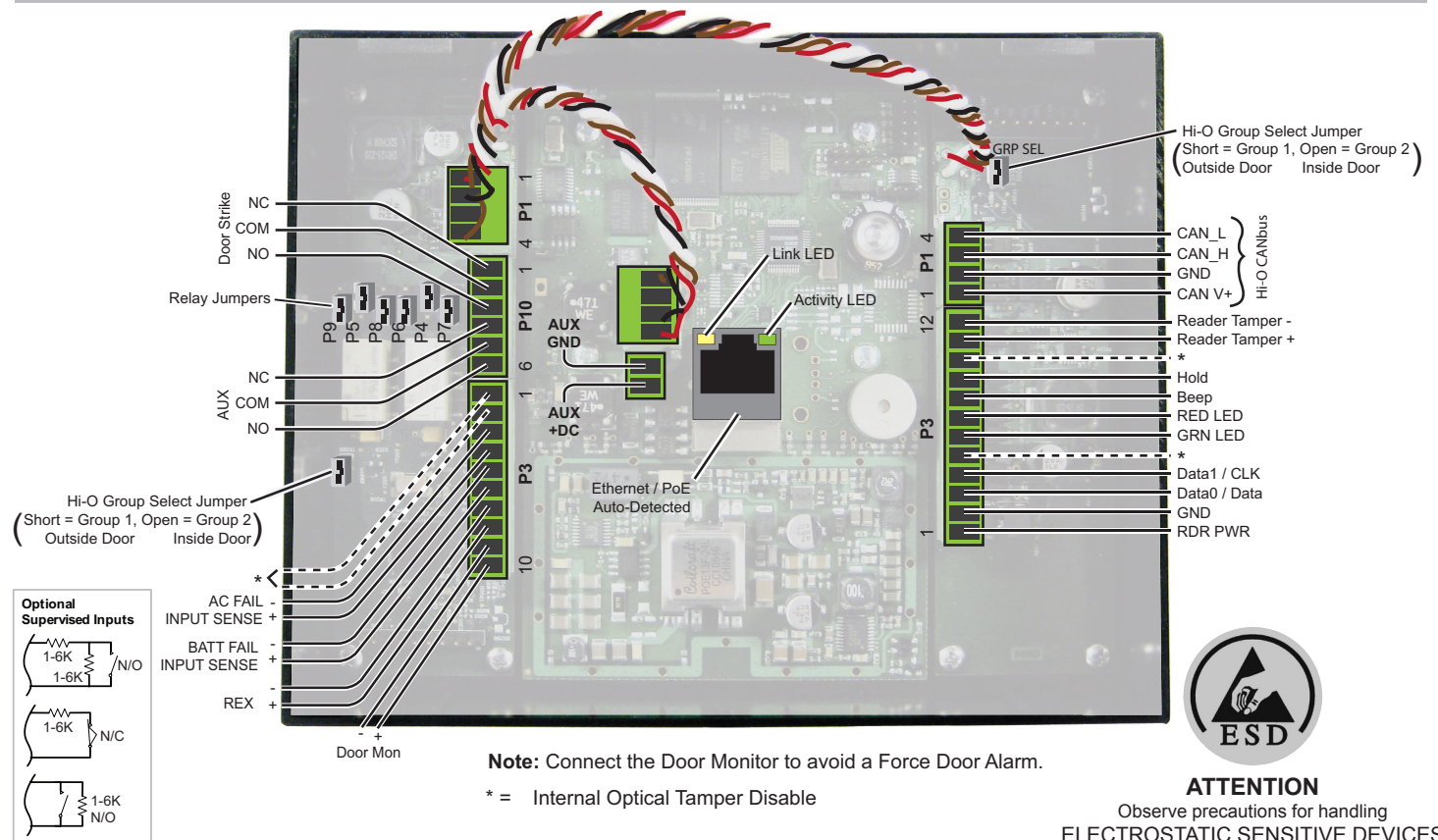
Select the appropriate power scheme to meet overall current draw. Using the analyses from the previous sections equates to the following power scheme possibilities.

Power Scheme	Details
1	Standard Networked Controller power derived from PoE. Insert a UL294 Listed PoE Injector in the Ethernet line to power the Standard Networked Controller. 
2	Standard Networked Controller power derived from an external +12VDC or +24VDC power supply. The Standard Networked Controller is connected directly to the Ethernet switch without a PoE injector. 

2 Mounting



3 Wiring



3.1 Internal Optical Tamper

To disable the internal optical tamper sensor for the right side PCB (reader interface board), attach a jumper wire from P3 pin 10 to P3 pin 5.

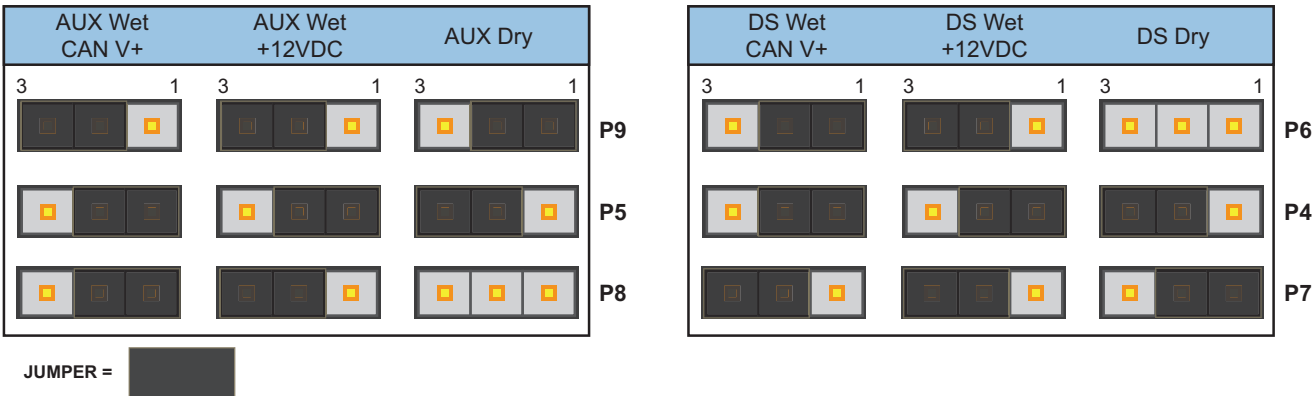
To disable the internal optical tamper sensor for the left side PCB (door interface board), attach a jumper wire from P3 pin 1 to P3 pin 2.

- CAUTION:**
- The EH400-K ships from HID with these jumpers pre-installed on the connectors. Removing these jumpers causes false tampers to trigger.

Note:

If desiring an external tamper, wire an unsupervised Normally Closed contact, replacing one of the pre-installed jumpers.

3.2 Relay Jumpers



3.3 Tamper (Reader Interface Board)

The Reader Tamper + and - are implemented allowing a connection for an open collector external tamper from a reader, such as iCLASS.

Note: Connect P3, Pin 12 (GND) from the Reader Interface Board to the same ground as the reader power, if the reader is not powered by the units 12 VDC output port.

3.4 Door Interface Board Groups 1 and 2

3.4.1 Group 1

Following are the inputs when the unit is configured for Group 1.

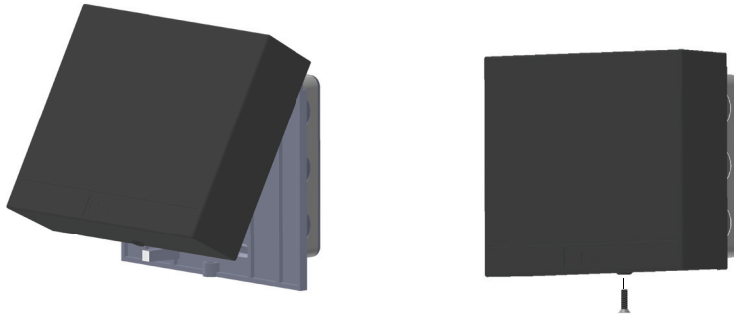
Input	Port	Pin
AC -	P3	Pin3
AC +	P3	Pin 4
BATT -	P3	Pin 5
BATT +	P3	Pin 6
REX -	P3	Pin 7
REX +	P3	Pin 8
Door Mon -	P3	Pin 9
Door Mon +	P3	Pin 10

3.4.2 Group 2

Following are the inputs when the unit is configured for Group 2.

Input	Port	Pin
Input 4 -	P3	Pin3
Input 4 +	P3	Pin 4
Input 3 -	P3	Pin 5
Input 3 +	P3	Pin 6
Input 2 -	P3	Pin 7
Input 2 +	P3	Pin 8
Input 1 -	P3	Pin 9
Input 1 +	P3	Pin 10

4 Install to Backplate



5 Contact

Contact EDGE EVO through one of the following methods.

5.1 Direct Connect

If EDGE EVO will be connected to a network using static IP addressing or if the Discovery GUI is not installed on the PC, use this method.

Note: The computer must be running Windows 2000 or XP and be configured for DHCP.

1. Disconnect the computer from the network and directly connect EDGE EVO to the computer with an Ethernet cable.
2. Click **Start > Run**. Enter `ipconfig /renew` ↵
3. Access a web browser and enter **169.254.242.121** into the **Address field** ↵

5.2 OPIN Discovery/Update Application

Use the **OPIN Discovery / Update Application** on a computer to locate, connect and update EDGE EVO.

System Requirements: Java 6.0 or later. Go to www.java.com to download.

Operating Systems: Windows XP and Fedora 8.

Find the OPIN Discovery / Update Application at www.ShareMethods.com > **OPIN** > **Firmware** > **2.3.x**. Save the files to your local harddrive.

The EDGE EVO must be connected to the network, and power applied, before the device is discovered.

1. With a computer connected to the same network as EDGE EVO, double-click **opin-update.jar**. The OPIN Discovery / Update Application opens and the **Controller Table** populates.

Note: If the **Controller Table** does not populate, go to **Edit > Broadcast Address**. The default broadcast address is 255.255.255.255. Some network switches may block this transmission. If this is the case, change the subnet to match the network, for example 10.7.255.255. Click **Save**.

2. Select the desired device from the list.
3. From **Path to Update Package** frame, browse to the firmware location on the computer.
4. Click **Install**. Firmware is installed.

EH400K - Provides additional functionality to not only Install firmware, but to **Changeover**, and **Rollback** firmware updates. Once firmware is installed, click **Changeover** to switch to the updated firmware. Click **Rollback** to switch back to the previous firmware version.

5. View the **Status Log** for each status while performing **Discovery** and **Update** functions.

6 Configure

The web browser will prompt for login information. From the **Login** screen enter **admin**, leaving the **Password** field empty. Follow the instructions on the web browser screen to configure EDGE EVO.

7 Power & Testing

Test the system once per year using the web Graphical User Interface to ensure all wiring and configuration is correct.

For additional installation information, such as PIR and other active Request-to-Exit (REX) devices, as well as connecting fire relays, see <http://www.hidglobal.com/edgesupport>.

Hi-O Interface Modules

Hi-O interface modules are used to expand functionality of the EDGE EVO Networked Controller. Hi-O interface modules connect the native Hi-O bus with additional components around and behind doors and other access points.

For Hi-O interface module wiring, see their prospective Installation Guides.

Go to www.hidglobal.com > **Support** > **Document Library**.

Search the document type as a **Installation Guide**.

Model	Description	Part Number
EDM-M	EDGE EVO Door Module	82342
EIM-M	EDGE EVO Input Module	82340
EWM-M	EDGE EVO Reader Module	82360
EDWM-M	EDGE EVO Door & Reader Module	82363AM
ELM	EDGE EVO Lock Module	82301
EVM	EDGE EVO Voltage Module	82365

Glossary

Acronym	Description	Acronym	Description
AC Fail	AC Power Failure Input	GND	Ground
AUX	Auxillary Output	GRN LED	Green LED Output
BATT Fail	Battery Failure Input	GRP SEL	Group Select
CAN_H	Hi-O CANbus High	NC	Normally Closed
CAN_L	Hi-O CANbus Low	NO	Normally Open
CLK	Clock	PIR	Passive Infared device
COM	Common	PoE	Power over Ethernet
Data0	Wiegand Data 0 Input	RED LED	Red LED Output
Data1	Wiegand Data 1 Input	REX	Request-to-Exit Input
Door Mon	Door Monitor Input	RLY	Relay
DS	Door Strike		

Regulatory

UL

Connect only to a Listed Access Control / Burglary power-limited power supply, or Listed Access Control / Burglary PoE (Power-over-Ethernet) adapter.

All National and local Electrical codes apply. Install in accordance with NFPA70 (NEC), Local Codes, and authorities having jurisdiction. Host-based security, Ethernet / Host Communication, has not been evaluated by UL. Ethernet port has been evaluated for supplemental use only.

Indoor use only.

The EDGE EVO family has been evaluated for standalone Access Control.

Mount onto UL Listed Single-Gang electrical box.

Standard Networked Controller and EDGE EVO Modules are UL Listed for installation within the protected area.

All panic and alarm hardware and equipment shall be UL Listed.

All cabling and wire shall be UL Listed or Recognized and suitable for the application.

All splices and connections shall be mechanically secure and bonded electrically.

EDGE EVO was evaluated for use with all Listed HID Global Wiegand models: iCLASS, Indala Prox, HID Prox, bioCLASS, SmartID, SmartTRANS, and Mag Stripe series (with and without keypad), up to 128-bit formats. EDGE EVO was evaluated for use with all HID Global Hi-O iCLASS readers.

Controller / Reader & Module or Networked Controller are UL Listed for installation in the unprotected area, as well as within the protected area.

FCC / CANADA RADIO CERTIFICATION

CAUTION: Any changes or modifications to this device not explicitly approved by manufacturer could void your authority to operate this equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

CE MARKING

HID Global hereby declares that these proximity readers are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Por el presente, HID Global declara que estos lectores de proximidad cumplen con los requisitos esenciales y otras disposiciones relevantes de la Directiva 1999/5/EC.

HID Global déclare par la présente que ces lecteurs à proximité sont conformes aux exigences essentielles et aux autres stipulations pertinentes de la Directive 1999/5/CE.

A HID Global, por meio deste, declara que estes leitores de proximidade estão em conformidade com as exigências essenciais e outras condições da diretiva 1999/5/EC.

HID Global bestätigt hiermit, dass die Leser die wesentlichen Anforderungen und anderen relevanten Bestimmungen der Richtlinie 1999/5/EG erfüllen.

HID Global dichiara che i lettori di prossimità sono conformi ai requisiti essenziali e ad altre misure rilevanti come previsto dalla Direttiva europea 1999/5/EC.

Download copies of the R&TTE Declaration of Conformity (DoC) at <http://certifications.hidglobal.com>.

JAPAN MIC

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According to «Administrative Regulations on Low Power Radio Waves Radiated Devices» without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency devices. The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Act.

The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiated devices.



ACCESS experience.

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Patent Pending

Check reader label for current regulatory approvals.

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