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USA

EDGE EVO®

Hi-O Networked Controller

EH400 / ESH400

INSTALLATION GUIDE

82000-920, Rev D.1
October 2012

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. Wire the EDGE EVO device to Hi-O interface modules providing connectivity to electronic door components and access control readers.

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 push plate, 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)	Power (W)	OPERATING TEMPERTURE	CABLE LENGTH	UL REF NUMBER
Input	DC Input (NSC)		+12 VDC	0.14 Amp	1.68	32° - 122°F (0° - 50° C)	Hi-O CAN Bus Total Length 100 ft (30 m) - 22 AWG ● 0.65mm ● 0.33mm² Maximum between drops 30 ft (10 m) 22 AWG ● 0.65mm ● 0.33mm² RJ45 = 328 ft (100 m) - Category 5 K	E400CX$_1$X$_2$N
			+24 VDC	0.08 Amp	1.92			
			PoE (+48VDC NOM)	0.05 Amp	2.40			
	DC Input (MAX)		+12 VDC	1.5 Amp	18.00			
			+24 VDC	1.5 Amp	36.00			
			PoE (+48 VDC NOM)	0.3 Amp	14.40			
Output	CAN DC Output (MAX)	AUX 12 / 24 VDC Input	+10.8 to +24 VDC	1.2 Amp*	28.80			
		PoE Input	+ 24 VDC (NOM)	0.4 Amp*	9.60			

NSC = Normal Standby Condition

* Combined output ratings not to exceed V*I = W.

Values:

- 1.2 Amp (+24 VDC AUX Input, 28.80 W)
- 1.2 Amp (+12 VDC AUX Input, 12.46 W)
- 0.4 Amp (PoE Input, 9.6 W)

X_1 = K for Black
G for Gray

X_2 = N for non-Solo
S for Solo

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 (EH400).

The following steps 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.
- Local Exit Alarm – Sounds an alarm upon an unauthorized exit.
- EDGE EVO Hi-O Edge Door Module (EDM-M) – Connects peripheral devices to the Hi-O bus.
- EDGE EVO Hi-O Networked Controller (EH400) – Provides access control and manages all peripherals around the door.
- Hi-O 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 is connected to the remote server through an Ethernet connection and manages door peripherals over the Hi-O bus. The EDM-M receives inputs from the Door Position Switch and REX Switch to drive the Magnetic Lock and Local Exit Alarm outputs.

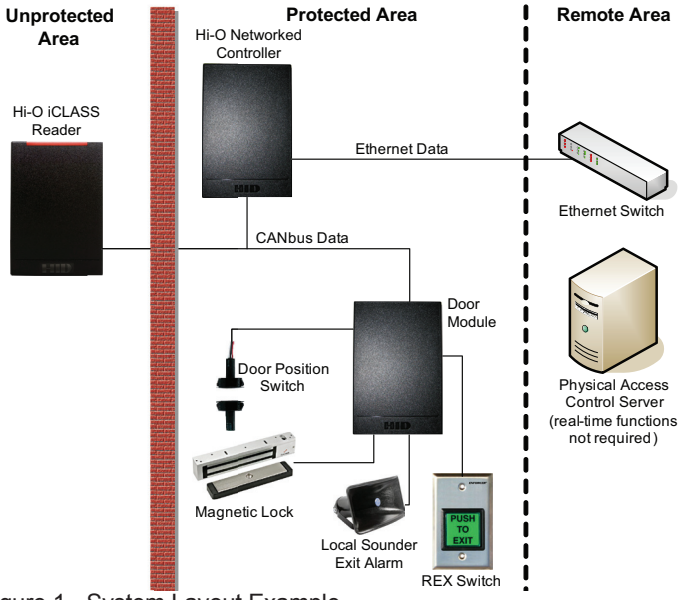


Figure 1 - System Layout Example

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	V_{IN} = 12VDC	15mA
(For example, Securitron MSS)	V_{IN} = 24VDC	15mA
Mag Lock	V_{IN} = 12VDC	300mA
(For example, Securitron M32)	V_{IN} = 24VDC	150mA
REX Switch	V_{IN} = 12VDC	28mA
(For example, Securitron EEB)	V_{IN} = 24VDC	38mA
Exit Alarm	V_{IN} = 12VDC	70mA
(For example, Detex 411)	V_{IN} = 24VDC	70mA
iCLASS Wiegand Reader	V_{IN} = 12VDC	150mA

Consult HID datasheets for Hi-O enabled interface devices.

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 connection to a Hi-O interface device. In this example, the EDGE EVO Hi-O Edge Door Module (EDM-M) provides general purpose I/O connectivity.

The Hi-O iCLASS reader does not require connection to the EDM-M and derives power and data connectivity from the Hi-O CANbus directly.

Device	Ports	Conditions	I_{OUT}
EDGE EVO Hi-O Door Module EDM-M	Strike / Aux NC or NO DC Output	+12VDC unregulated (@+12VDC EDM-M input)	700mA*
		+24VDC unregulated (@+24VDC EDM-M input)	700mA*
		+12VDC regulated (@+24VDC EDM-M input)	310 mA*
	Dry Jumpers	+12 to +24VDC External	2.00 Amp**

* Shared between each relay

** Each relay

The combined current requirement for the four door peripherals identified in “Step 1 - Identify System Components” on page 2 is 413mA @ +12VDC,
or 273mA @ +24VDC.

The EDM-M provides sufficient power when the door peripherals are connected to the Strike/AUX relays configured for unregulated output at +12VDC/+24VDC. Alternatively, connect the door peripherals to the Strike/AUX relays configured for Dry contact.

The Hi-O iCLASS reader does not require connection to the EDM-M and derives power and data connectivity from the Hi-O CANbus directly.

C - Compute and Compare Overall Current Draw

Calculate the total current draw for all door peripherals, all Hi-O interface devices, and all Hi-O enabled readers with the following equation, adding terms as required.

$$I_{total} = I_{dps} + I_{mag} + I_{rex} + I_{alarm} + I_{Hi\text{-}O\ iCLASS\ reader} + \ldots + I_{EDM\text{-}M}$$

For this example, the total current draw is shown.

I_{total} @ +12VDC = 15mA + 300mA + 28mA + 70mA + 160mA* + 40mA* = 613mA

I_{total} @ +24VDC = 15mA + 150mA + 38mA + 70mA + 160mA*+ 40mA* = 473mA

* Notes:

a. The EDM-M draws 40mA standby current.

b. The Hi-O iCLASS reader requires a +24VDC to +12VDC converter module (EDGE EVO Hi-O Voltage Module - EVM), adding approximately 5 to 10mA for overall load requirements.

Compare the required current draw (I_{total}) to the output current capacity of the EH400 (see “Specifications” on page 1) to select the EH400 power scheme. The CAN DC PWR Output represents the entire power output capacity of the EH400.

Device	Port	Conditions	V out	I out
Hi-O Networked Controller (EH400)	CAN DC PWR Output (MAX)	AUX +12/24 VDC Input	+10.8 to +24VDC	1.2Amp
		PoE Input	+24VDC (NOM)	400mA

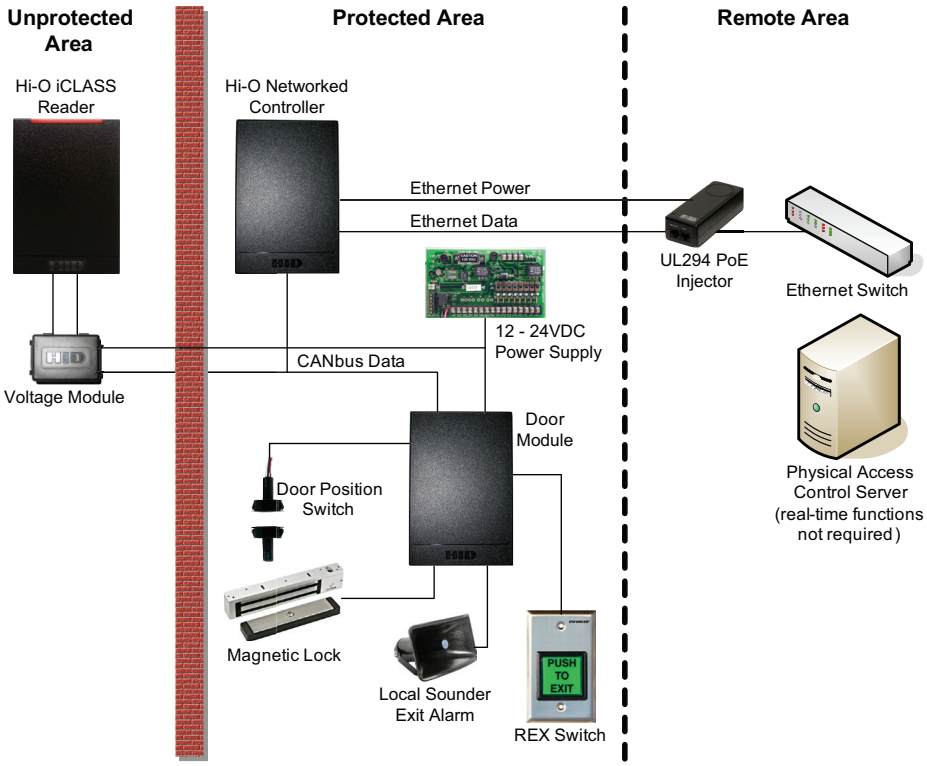
In this example, the EH400 provides sufficient power when operating with +12/+24VDC auxiliary power supplies.

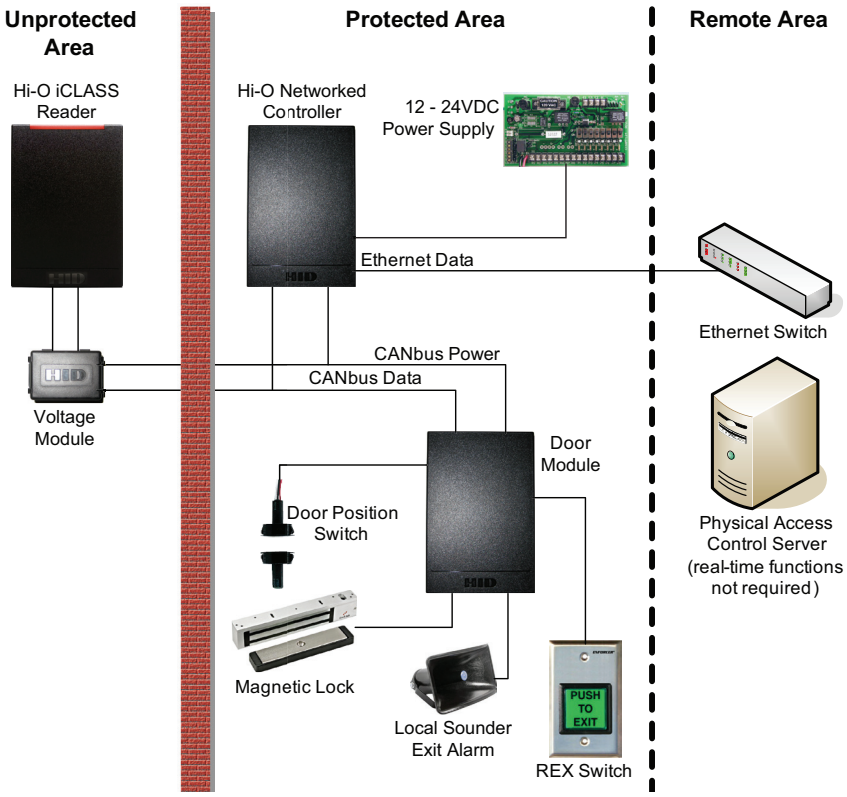
Directly connect the door peripherals identified in “Step 1 - Identify System Components” on page 2 to the I/O ports of the EDGE EVO Hi-O Edge Door Module (EDM-M). Consult the EDM-M datasheet to determine the available current capacity for the selected input power scheme of the EH400.

Ensure all door peripherals connected to the Strike/AUX relays and the Reader DC PWR Output or both do not exceed 1.2 Amps (AUX Input) or 400mA (PoE Input) combined. Alternatively, connect the door peripherals to the Strike/AUX relays configured for Dry contact up to 2 Amps per relay.

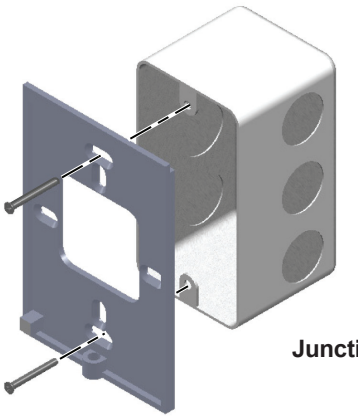
Step 4 - Select Power Scheme

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

Power Scheme	Details
1	Hi-O CANbus power derived from an external +12VDC or +24VDC power supply. The Hi-O Networked Controller power is derived from PoE. • Hi-O CANbus connections to the Hi-O Networked Controller shall omit the CANbus V+ and CANbus GND output connections. • Insert a voltage converter module between the CANBus and Hi-O iCLASS reader. • Insert a UL294 Listed PoE Injector in the Ethernet line to power the Hi-O Networked Controller. 

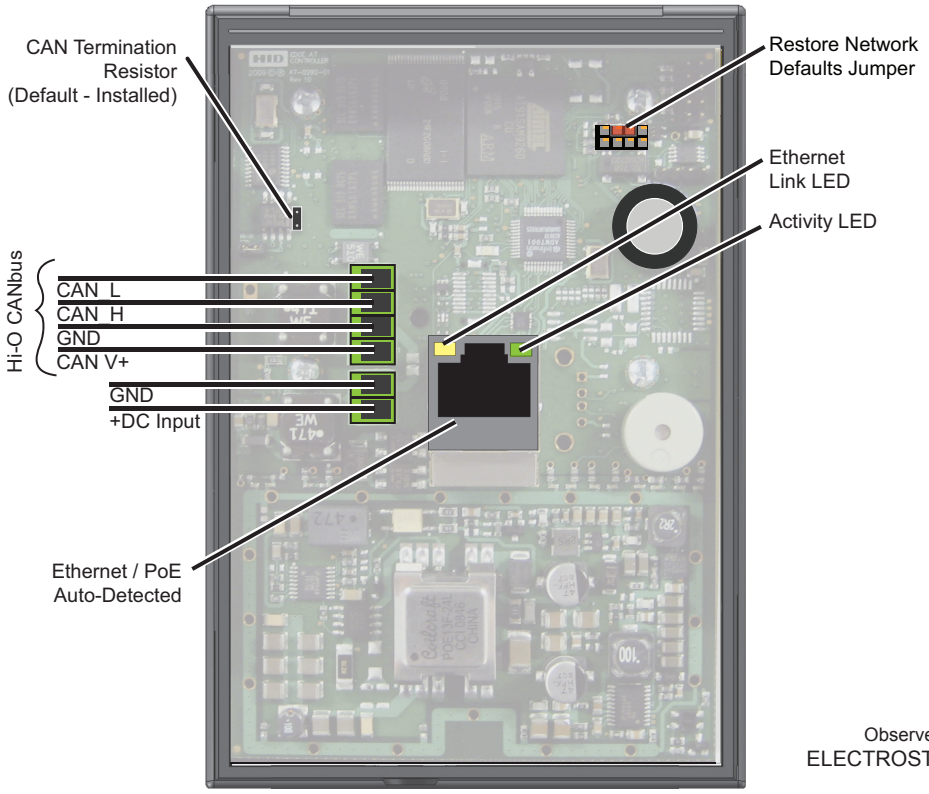
2	The Hi-O Networked Controller power is derived from an external +12VDC or +24VDC power supply. • Hi-O CANbus connections to the Hi-O Networked Controller includes the CAN V+ and CAN GND output connections. • Insert a voltage converter module between the CANBus and Hi-O iCLASS reader. • The Hi-O Networked Controller is connected directly to the Ethernet switch without a PoE injector. 

2 Mounting



Junction box not included.

3 Wiring



ATTENTION
Observe precautions for handling
ELECTROSTATIC SENSITIVE DEVICES

Network Defaults Jumper

The Network Defaults Jumper requires physical access to the EDGE EVO controller. Physical access provides the necessity to place a jumper over the debug port prior to the controller rebooting. The controller reconfigures the network settings to the factory defaults when the jumper is on the debug port during a reboot. From this point, configuration (or re-configuration) proceeds normally.

Use the Network Defaults Jumper to correct potential errors in an EDGE EVO controller Network Configuration or if the admin password is forgotten.

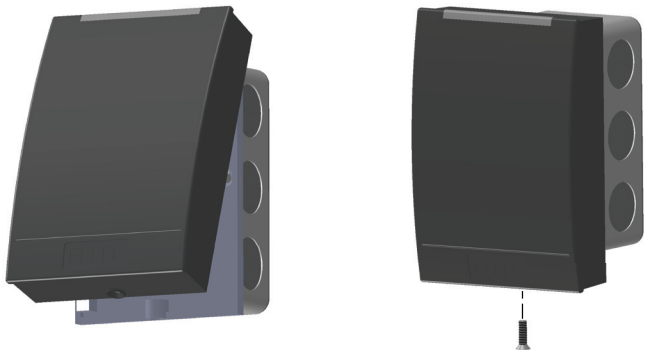
A jumper is supplied with the EDGE EVO for the Hi-O termination; borrow this jumper to perform this process. Replace the jumper to the Hi-O termination after restoring network defaults.

1. Remove the back plate on the EDGE EVO.
2. Loosen the Mylar cover.
3. Reboot the controller and place the supplied jumper over pins 3 and 5 of the Debug port after the beep. The Debug port is an eight pin header, located above and to the right of the Ethernet connector, underneath the Mylar.

   Note: The network reset opportunity occurs for 30 seconds, while rebooting the controller. On an EDGE EVO, a second beep occurs to signal the end of the 30 second period.
4. After 30 seconds, the beeper stays on constantly to indicate success. When an error occurs, you receive a single beep.
5. Remove the jumper; return it to the Hi-O termination header and cycle power. The controller resets in approximately 60-seconds. Once the reset is complete, you hear the single beep. After the 30-second window, you hear the second beep. The controller is fully functional during this time.

   CAUTION: During the controller rebooting process, all network configuration information is overwritten and returned to the original defaults.
6. Configure the controller for your installation parameters.
7. Reinstall the back plate of the EDGE EVO.

4 Install to Backplate



Contact EDGE EVO through one of the following methods.

5 Contact

Direct Connect

If connecting EDGE EVO 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** ↵

Discovery GUI (for DHCP networks)

With a DHCP network, use the HID Discovery GUI on the PC to locate and connect the Controller.

Note: The Controller must be connected to the network before power is applied for DHCP to function.

1. With the PC connected to the same network as the Controller, double-click **hid-discovery.exe**.
2. Select the device from the list.
3. Click **Browser**.

If the Discovery GUI is not on the PC, download the application from www.hidglobal.com/downloads/DiscoveryClient.zip.

Note: Java is required for the Discovery GUI.

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.

For EDGE EVO Solo, reference the EDGE EVO Solo User Guide, 83000-902, rev B.x.

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 (Passive Infared Device) 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 interface the EDGE EVO device (Controller / Reader & Module or Network Controller) with door electronic components. Components include access control readers, strike, magnetic lock, request to exit, door position switch, and auxillary devices.

For Hi-O interface module wiring, see their respective 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 Sense	GND	Ground
AUX	Auxillary Input or Output	GRN LED	Green LED Output
BATT Fail	Battery Failure Input Sense	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		

Intentional Blank

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.

Hi-O 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.

Hi-O Networked Controller is UL Listed for installation in the unprotected area, as well as within the protected area.

CAUTION: Any changes or modifcations to this devise not explicitly approved by the manufacturer could void your authority to operate this equipment.

FCC

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.

Canada Radio Certification

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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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

この装置は認証済みです。

TAIWAN NCC

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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.

hidglobal.com

82000-920, Rev D.1
Patent Pending

Check reader label for current regulatory approvals.

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