



**Wireless Access**

**INSTALLATION INSTRUCTIONS**

**WIRELESS READER  
INTERFACE - INDOOR**

**(WRI-IN-12VDC or AUWRI-IN-12VDC)**

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# Wireless Access

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## Ingersoll Rand Security Technologies



## INSTALLATION INSTRUCTIONS

### Wireless Reader Interface - Indoor (WRI-IN)

**NOTE:** These instructions are for installing the Wireless Reader Interface - Indoor (WRI-IN-12VDC), a component of a Schlage Wireless Access System. AUWRI-IN-12VDC is an Australian version of the indoor wireless reader interface.

**In this manual, WRI-IN refers to either a WRI-IN-12VDC or an AUWRI-IN-12VDC model.**

After completing this installation refer to the “Configuring and Operating the Schlage Wireless Access System” manual.

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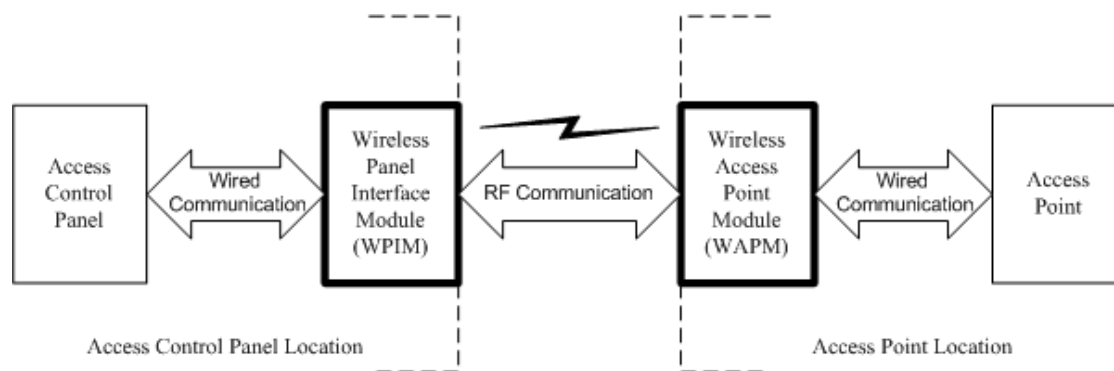
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## 1. Schlage Wireless Access System Components

### 1.1 Overview

Every access control system that uses Schlage Wireless Access contains two different types of modules (Figure 1-1):

- at least one Wireless Panel Interface Module (WPIM), and
- at least one Wireless Access Point Module (WAPM)



**Figure 1-1 – Schlage Wireless Access System Block Diagram**

The Schlage Wireless Access product line contains several different expressions of each module.

The WPIM is wired to the access control panel and ideally is installed very close to the access control panel. The WPIMs installation location is determined by the location of the WAPMs with which it will communicate using RF.

The WAPM is installed at the access point where access will be controlled and/or monitored. Depending on the application and which WAPM is used, some wiring at the access control point may be required.

Regardless of which WPIM or WAPM module is used, the communication link between the WPIM and WAPM is always RF.

This manual describes the installation of a Wireless Reader Interface - Indoor (WRI-IN-12VDC or AUWRI-IN-12VDC) which is a WAPM.





## 2.2 Determining the Best WPIM and WRI-IN Locations

Proper selection of WPIM and WRI-IN module mounting locations insures reliable RF communications.

The WPIM manual contains a section for determining the best location for the WPIM.

The maximum distance between WPIM and a WRI-IN is 200' horizontally when installed inside a building on the same floor that uses normal building construction materials. Never locate the WRI-IN and WPIM more than one (1) floor apart. If on different floors, limit the maximum horizontal distance to 100'. Do not locate on different floors if the building's floors use concrete over metal construction. The maximum distance is 1000' for a line of sight installation.

This section provides additional application specific help and guidelines to select the best mounting location for the WRI-IN Transceiver Control Box:

- Mount the WRI-IN Transceiver Control Box inside the protected area.
- Mount the WRI-IN Transceiver Control Box on the wall, at least 55" from the floor
- Mount the WRI-IN Transceiver Control Box within 500' cable feet of the Card Reader or other input device
- Mount the WRI-IN Transceiver Control Box within 500' cable feet of the Strike.
- A WRI-IN must, in all directions (sides, top, bottom, and back), have a minimum 1" separation from any metal surface. Therefore if the WRI-IN must be mounted on a metal surface, though not recommended, the supplied 1" spacers must be used.

**NOTE: A WRI-IN located with a substantial steel barrier intervening between it and the WPIM may require alternate WRI-IN and/or WPIM placement in order to ensure reliable RF communications. In these applications, mount the WPIM remote from the access control panel. Choose the WPIM or the WPIM's Remote Antenna location to prevent "shadowing" of the WRI-IN from WPIM radio transmissions.**

## 2.3 Mounting the WRI-IN

- 2.3.1 **TRANSCIVER CONTROL BOX** – A 1” hole is provided in the back of the Transceiver Control Box for routing wires in & out. If needed, additional hole(s) can be drilled in the lower left hand corner of the Transceiver Control Box. Wire routing inside the enclosure is very important. Improper wire routing will reduce the RF range. Keep the wires inside the enclosure as short as possible (i.e. do not coil any excess wire inside the enclosure) (Figure 2-1 & Figure 2-2).



**Figure 2-1 – Improper Wire Routing**



**Figure 2-2 – Proper Wire Routing**

- 2.3.1.1 Remove the Transceiver Control Box cover.
- 2.3.1.2 Place the Transceiver Control Box (cover removed) against the wall in the position it was successfully “link” tested.
- 2.3.1.3 Using Transceiver Control Box as a template, mark the four corner mounting holes and the ½” wire hole (if used) with a pencil.
- 2.3.1.4 Drill a 9/32” hole at each mounting mark, 1 ¾” deep, and a ½” hole at the wire hole mark (if used).
- 2.3.1.5 Insert the four anchors provided firmly into the holes so they are flush with the wall.
- 2.3.1.6 Depending on the installation, you may want to screw the Transceiver Control Box to the wall now or wait until the rest of the components are installed to facilitate wire routing.

If the WRI-IN is to be mounted on a non-metallic surface use the #8, 2 ½” screws provided to attach the WRI-IN to the wall.

If the WRI-IN is to be mounted on a metallic surface use the round 1” high spacers and the #8, 2½” screws provided to attach the WRI-IN 1” from the wall.

- 2.3.2 **CARD READER** – If the installation uses a card reader or other input device, mount it using the manufacturer’s installation instructions. Route the card reader wires into the Transceiver Control Box.
- 2.3.3 **STRIKE** - If the installation uses an electric locking device, mount it using the manufacturer’s installation instructions. Route the electric locking device wires into the Transceiver Control Box.
- 2.3.4 **DOOR POSITION SWITCH** – If the installation uses a door position switch, mount it using the manufacturer’s installation instructions. Route the door position switch wires into the Transceiver Control Box.

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- 2.3.5 **REQUEST TO EXIT DEVICE** – If the installation uses a separate request to exit device, mount it using the manufacturer’s installation instructions. Route the request to exit device wires into the Transceiver Control Box. The request to exit device must have normal open dry contacts that close when request to exit is active.
- 2.3.6 **REQUEST TO ENTER DEVICE** – If the installation uses a request to enter device, mount it using the manufacturer’s installation instructions. Route the request to enter device wires into the Transceiver Control Box. The request to enter device must have normal open dry contacts that close when request to enter is active.

### 2.4 Getting Wires In & Out of the WRI-IN

The back of the WRI-IN enclosure has a pre-drilled hole for getting wires in & out of the WRI-IN. For optimum WRI-IN performance, this wire hole must be used.

If holes must be drilled in the WRI-IN enclosure determine the size and number of entry/exit connectors to be used.

Use entry/exit wiring connectors/glands that are compliant with local electrical codes (i.e. conduit, etc.)

**NOTE:** *When drilling, make certain that the drill bit does not damage any electronics inside the enclosure. Use light drill pressure so that the bit does not enter the enclosure very far when the bit breaks through the inside of the enclosure.*

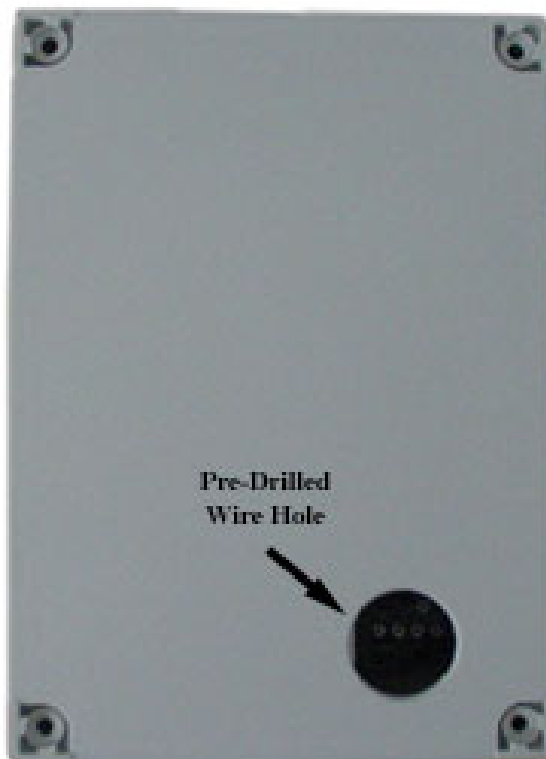


Figure 2-3 – Rear of WRI-IN Enclosure



## 2.5 Wiring the WRI-IN to its Access Control Peripherals

There are seven WRI-IN PCB connectors that provide connections to Access Control Peripherals that the WRI-IN will monitor and/or control (Figure 2-4):

- DC Input Power
- Tamper Input
- Door Position Input
- Request to Exit Input
- Request to Enter Input
- Portal Output
- Card Reader

Some of the connections are optional based on the specific application of the WRI-IN. Refer to Section 3 for cable and wire specifications for the WRI-IN.

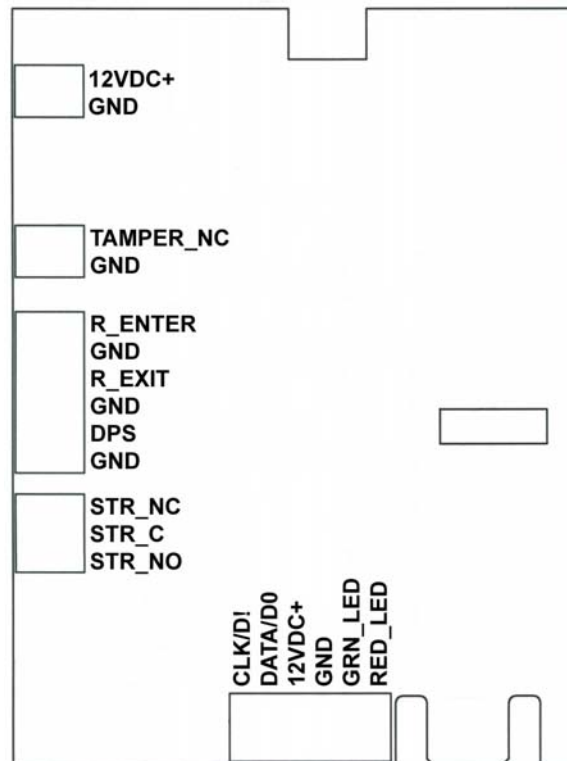


Figure 2-4 – WRI-IN Printed Circuit Board (PCB) Connections

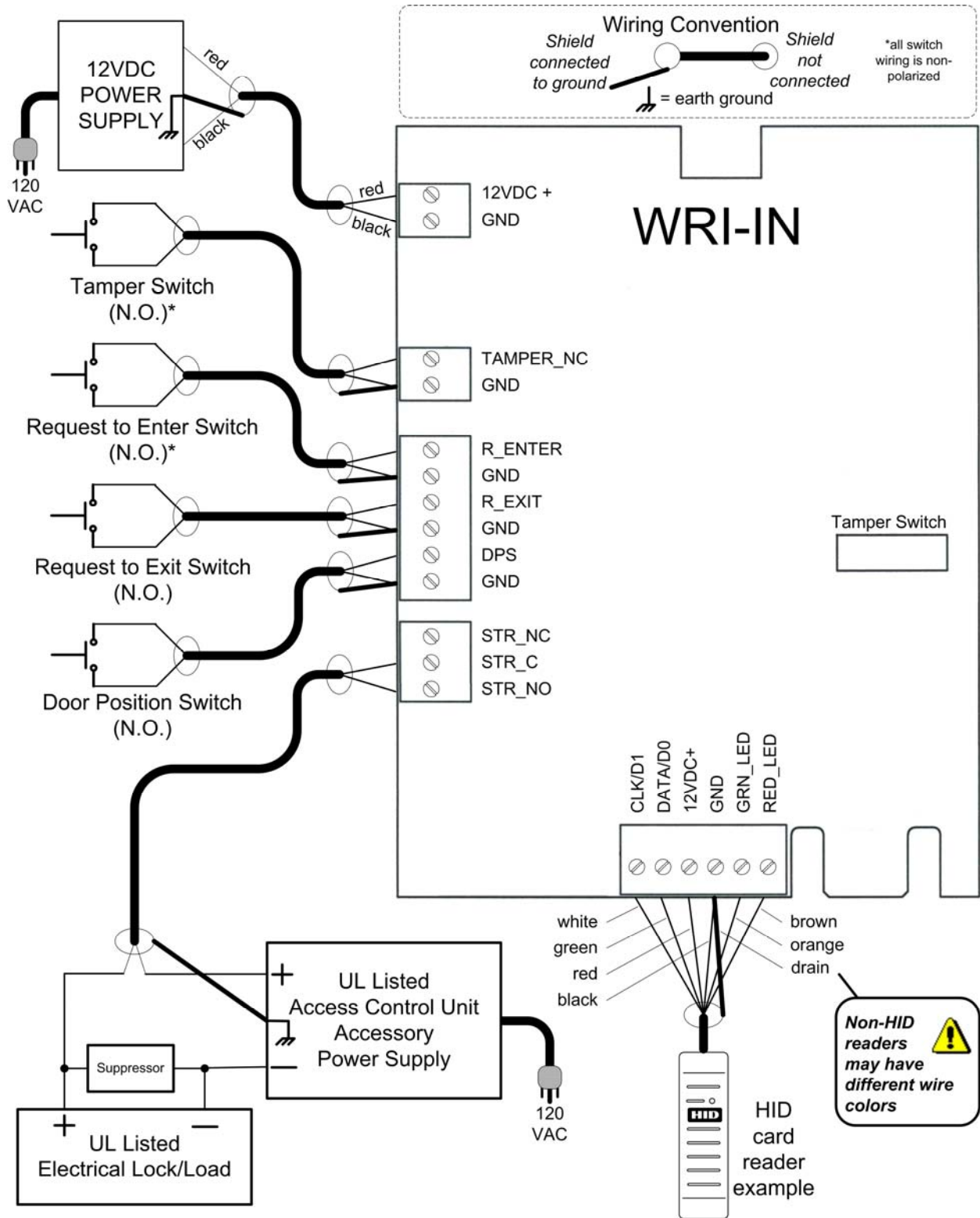


Figure 2-5 – Typical Access Point Configuration



## 2.5.1 DC Input Power

The DC Input Power connection is mandatory. An external, UL approved, DC power supply that can supply 12 VDC (7-14VDC range) must be provided. The DC power supply must be capable of providing 300 mA of current to power the WRI-IN. Add the power requirements of the access control peripherals connected to the WRI-IN to the 300 mA to determine the overall size of the DC power supply.

Figure 2-4 shows where the DC power is connected to the WRI-IN PCB. Table 2-1 shows how to connect the DC power. Make certain to observe the polarity.

Connect the shield of the DC Input Power cable to the Ground (-) terminal at the power supply. Do not connect the cable shield at the WRI-IN (Figure 2-5).

DC INPUT POWER	12VDC+	The WRI-IN typically operates from 12 VDC (7-14 VDC) and draws 300mA peak maximum. This does not include the power consumption required by the peripherals (strike, reader, etc).
	GND	

**Table 2-1 – DC Input Power Connections**

## 2.5.2 Tamper Input

The Tamper Input connection is optional and provides a way of monitoring and external tamper switch. The Tamper Input is in parallel with the Tamper Switch, SW1, on the WRI-IN PCB. SW1 monitors the state of the WRI-IN enclosure door and generates a tamper trouble when the door is open. If other possible tamper conditions (i.e. power supply enclosures, gate controllers, etc.) need to be monitored, wire a single pole, single throw (SPST) to the Tamper Input. When terminals TAMPER\_NC & GND (Figure 2-4) are shorted, a tamper trouble signal is generated (Table 2-2).

Connect the shield of the Tamper Input cable to the WRI-IN GND. Do not connect the cable shield at the Tamper Switch (Figure 2-5).

The Tamper Input connection is not connected in UL installations.

TAMPER	TAMPER_NC	A dry contact closure across these terminals causes a tamper trouble signal to be sent to the ACP
	GND	

**Table 2-2 – Tamper Input Connections**

## 2.5.3 Portal Inputs

The portal inputs consist of a Request to Enter, Request to Exit, and Door Position Switch inputs. Wiring any or all of the Portal Inputs is optional based on the WRI-IN application. All three inputs are expecting an open circuit or a short circuit across their terminals.

When terminals R\_ENTER & GND (Figure 2-4) are shorted, a “Request to Enter” signal is generated (Table 2-3).

When terminals R\_EXIT & GND (Figure 2-4) are shorted, a “Request to Exit” signal is generated (Table 2-3).

When terminals DPS & GND (Figure 2-4) are shorted, a “Portal Closed” signal is generated. When terminals DPS & GND are open, a “Portal Open” signal is generated (Table 2-3).

Connect the shield of the Portal Input cables to the appropriate WRI-IN GND terminal.. Do not connect the cable shield at the Request to Enter, Request to Exit, or Door Position Switches (Figure 2-5).



REQUEST TO ENTER	R_ENTER	A dry contact closure across these terminals initiates a request to enter.
	GND	
REQUEST TO EXIT	R_EXIT	A dry contact closure across these terminals initiates a request to exit.
	GND	
DOOR POSITION SWITCH	DPS	A dry contact closure across these terminals indicates to the ACP that the access point portal is closed. An open circuit indicates to the ACP that the access point portal is open.
	GND	

**Table 2-3 – Portal Inputs Connections**

## 2.5.4 Portal Output

The Portal Output consists of a Strike Relay with form C outputs (common, normally open, and normally closed). Wiring of the Portal Output is optional based on the WRI-IN application.

When the portal is unlocked, the Strike Relay Output turns on indicating that the portal should be unlocked. Therefore the appropriate side of the relay contact (normally open or normally closed) must be used to make certain that when the relay is de-energized that the portal is locked and when the relay is energized that the portal is unlocked.

STRIKE RELAY OUTPUT	STR_NC	Strike relay output, isolated form C contact rated 6 A @ 24 VDC or 120 VAC and 3 A @ 240 VAC, resistive (silver alloy contacts for heavy loads).
	STR_C	
	STR_NO	

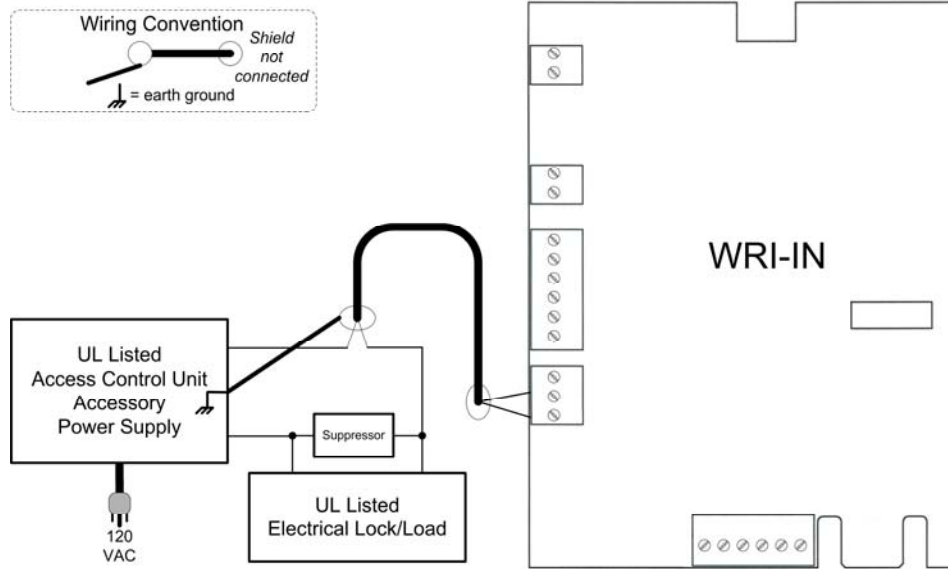
**Table 2-4 – Portal Output Connection**

A Suppressor must be installed with every electrical switching device run through the Portal Output relay contact. The Suppressor protects the WRI-IN from the power generated by the collapsing magnetic field of an electrical load. The Suppressor will maximize the life of the WRI-IN.

Follow the Electrical Lock/Load manufacturer’s recommendation for suppression of magnetic/inductive loads. A properly rated bi-directional Tranzorb (Silicon Avalanche Diode) may also be used. Install the Suppressor within 18 inches of the electrical load (Figure 2-6).

**NOTE:** The Portal Output must utilize a dedicated shielded cable to prevent transient contamination of other WRI-IN signal wiring. Do not run the Portal Output wires in the same cable or conduit as any other WRI-IN wiring. The Portal Output wiring should be at least 12 inches away from any other WRI-IN wiring or it should be run in a separate conduit.

Connect the shield of the Portal Output cables to the appropriate WRI-IN J7-6 terminal (GND). Do not connect the cable shield at the Electrical Lock/Load (Figure 2-5).



**Figure 2-6 – Portal Output Suppression Diagram**



## 2.5.5 Card Reader/Keypad

Any input device with a Wiegand or Clock & Data bit stream can be used with the WRI-IN. A transaction must be a single bit stream of between 4 and 255 bits.

The WRI-IN provides a Card Reader interface. Wiring of the Card Reader is optional based on the WRI-IN application.

Take the power requirements of the Card Reader into consideration when sizing the power supply for the WRI-IN and its peripherals (Section 2.5.1).

Card Reader connections are shown in Table 2-5.

Connect the Card Reader cable shield to the WRI-IN GND terminal on the Card Reader connector. Do not connect the cable shield at the Card Reader (Figure 2-5).

CARD READER	CLK/D1	Card Reader inputs, each input line has a 3.3k pull up resistor to 5V, and a 12V transient suppressor to GND.
	DATA/D0	
	12VDC+	Reader power supply output. The WRI-IN PC board routes its own power supply input to these terminals, so the readers see the same supply as the WRI-IN. If other than 12 VDC is required for the input device, then a separate input device power supply must be used. Make certain that a common ground connection is established between the input device's power supply and the WRI-IN.
	GND	
	GRN_LED	Green LED signal line. This signal goes to ground through 100ohm when activated. When deactivated, it is pulled up to +5V through 1.1kohm.
	RED_LED	Red LED signal line. Same functionality as GRN line, except RED.

**Table 2-5 – Card Reader Connections**



### 3. WRI-IN Cable/Wire Specifications

Application	Part Number	AWG	Description	Maximum Distance
DC Power Input	Belden 8760	18	2 conductor	1,000'
Tamper	Belden 8760	18	twisted pair shielded	2,000'
Request to Enter	Belden 8760	18	twisted pair shielded	2,000'
Request to Exit	Belden 8760	18	twisted pair shielded	2,000'
Door Position Switch	Belden 8760	18	twisted pair shielded	2,000'
Strike Relay Output	Belden 8760	18	twisted pair shielded	2,000'
Card Reader	Alpha 1296C	22	6 conductor shielded	500'

**Table 3-1 – WRI-IN Cable/Wire Specifications**

**This completes the installation of the WRI-IN.**

**If the Wireless Panel Interface Module (WPIM) that will control this WRI-IN is not installed, now is the time to install it, please refer to the “PIM Installation Instruction” manual.**

**If the WPIM is installed, then you are ready to link and configure your Schlage Wireless Access System, please refer to the “Configuring & Operating a Schlage Wireless Access System” manual.**



# Wireless Access

## 4. Contacting Technical Support

For questions regarding Schlage Wireless Access:

[www.ir-swa.com](http://www.ir-swa.com)

main: 800-313-2962 (630-876-5680)

technical support: 866-322-1237

fax: 630-293-4257





## 5. FCC Compliance, ACA Compliance & Warnings

### 5.1 FCC Compliance

- This device has been authorized by the FCC Rules and Industry Canada.
- This device complies with the limits for a Class B digital device and a Class B intentional radiator, pursuant to Part 15 of the FCC Rules and with RSS-210 of Industry Canada. 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.
- The Schlage Wireless Access System Component must be installed by qualified professionals or contractors in accordance with FCC part 15.203, Antenna Requirements.
- Do not use any antenna other than the one provided with the unit.

### 5.2 ACA Compliance

- The Australian version of AUWRI-IN-12VDC has been authorized by the Australian Communications Authority (ACA).

### 5.3 UL Compliance

- The Wireless Reader Interface - Indoor (WRI-IN-12VDC) is listed under UL294 as an access control system accessory.
- Access equipment manufactured and/or sold by Ingersoll Rand Security Technologies, is not rated for, or intended for use in life safety installations.
- UL listed panic hardware shall be used to allow emergency exit from the protected area.
- UL listed compatible readers: HID, Model PROXPOINT.
- Use an Ingersoll Rand Security Technologies power supply; model 593PI-12DC (UL listed class 2 power supply).
- The Wireless Reader Interface - Indoor (WRI-IN) maximum standby current at 12 VDC is 10mA.

### 5.4 Warnings

- RF Exposure - To comply with FCC RF exposure requirements for mobile transmitting devices this transmitter should only be used or installed at locations where there is normally at least a 20 cm separation between the antenna and all persons.
- Do not co-locate and operate in conjunction with any other antenna or transmitter.
- Changes or modifications not expressly approved by Ingersoll Rand Security Technologies could void the user's authority to operate the equipment.



## 6. Revision History

Version	Date	Changes
X001	03/07/02	preliminary in house release for comments
X001.1	03/22/02	made adjust in text for differences in WRI-IN-12VDC & WRI, added appropriate figures
X001.2	04/05/02	updated figures
X001.3	05/13/02	added UL changes, corrected grammar errors, changed getting wires in & out section, added WRI-IN-12VDC/metal minimum distance paragraphs
001	05/16/02	released for publication
002	09/16/03	updated wiring diagram
003	11/26/03	added boilerplate section, added more conditions to best WPIM & WRI locations, minor edits to Mounting WRI-IN-12VDC section, changed strike relay specs (table 2-4), enhanced specs for card readers, added statement about using external card reader power supplies
004	02/20/04	added UL required maximum standby current specification
A	11/02/04	Changed Logo
B	05/17/05	Changed various nomenclature and contact info throughout manual.
C	09/27/06	made minor edits and corrections, updated pictures, added Schlage logo, changed Ingersoll-Rand to Ingersoll Rand, changed Security & Safety to Security Technologies, removed address from cover page, changed wyreless to wireless, removed all <sup>TM</sup> 's, changed <a href="http://www.wyrelessaccess.com">www.wyrelessaccess.com</a> to <a href="http://www.ir-swa.com">www.ir-swa.com</a> , changed technical support # to 866-322-1237, added Australian model number: AUWRI-IN-12VDC, changed WRI-IN-12VDC references to WRI-IN where reference applies to both WRI-IN-12VDC & AUWRI-IN-12VDC