Operators Manual

Doc #P10226 Rev 1.7

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Figure Reference Guide

Part Numbers

DS004-BRIDGE	Wiegand Bridge system: includes DS004-CONTROLLER and DS004-REMOTE
DS004-CONTROLLER	Controller Interface
DS004-REMOTE	Remote Interface

Overview

The DS004 Wiegand Bridge System consists of two units: The Controller Interface, Model DS004-CONTROLLER, and the Remote Interface, Model DS004-REMOTE. The system provides a wireless connection (bridge) from a remote location, such as at a door, to the controller location at the access control panel. The Controller Interface connects with the access control panel and communicates wirelessly to the Remote Interface, which is placed near any peripheral Wiegand device (card reader / keypad / receiver /etc). Each DS004 Bridge System consists of one Wiegand input, two relay outputs and inputs for door monitor sensors/request to exit inputs. The Sure-Fi App provides troubleshooting, diagnostics information, and field upgrades.

Features

- Includes complete wireless solution from Remote location (reader/door) to Controller location
- Range: up to 1 mile through obstructions and greater than 50 miles line-of-sight.
- One Wiegand input (compatible with any Wiegand protocol)
- Two relay outputs (NO, NC, COM terminals) Wet or Dry contacts.
- Request to exit input (REX)
- Door monitor input (DPS)
- Backup Battery charger and UPS function
- DIN rail mount or direct wall mount
- One Auxiliary input

General Specifications

Operating Voltage:	12VDC +/- %5
Operating Current:	@ 12VDC: 0.08A (idle), 0.3A (transmit)
Operating Power:	3.6 Watt (peak)
Battery backup:	12V sealed lead acid (SLA) type (not included)
Battery Low Threshold:	< 11VDC
Battery Charge Voltage:	13.75V maximum at standby charge.
Battery Charge Current:	0.125A maximum at low battery voltage level.
Relay Outputs:	Two relays: 2A 250VAC / 250VDC. NO, NC, COM, Wet / Dry
	Note: Maximum allowable combined current is 3 Amps.
Range:	Up to 1 mile through obstructions.
	Greater than 50 miles line-of-sight
Operating Temperature:	-40°C to +85°C (-40°F to +185°F)
Storage Temperature:	-55°C to +125°C (-67°F to +257°F)
Humidity:	0 to 95% non-condensing
Dimensions (L x W x H):	90mm x 107mm x 32.5mm (3.54" x 4.23" x 1.28")
DIN mount type:	35mm x 7.5mm DIN rail (DIN46277-3)
Degree of Protection:	IP20 to IEC/EN 60529

Radio Transceiver Specifications

Transmit Power:	1 Watt (30dBm)
Frequency Band:	902 – 928MHz
Channels:	72 (Frequency hopping)
Receiver Sensitivity:	-133dBm
Link Budget:	163dB

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The Destination Company for Perimeter Access Solutions

Mounting Orientation and Guidelines

The Controller and Remote Interfaces are tested and certified to be oriented with the Antenna positioned at top side of the unit and mounted vertically as shown in Figure 1. For the best radio performance, route all wires and cables away from the Antenna.

Device Overview and Description (Remote shown)

Figure 1: Interface Label Diagram
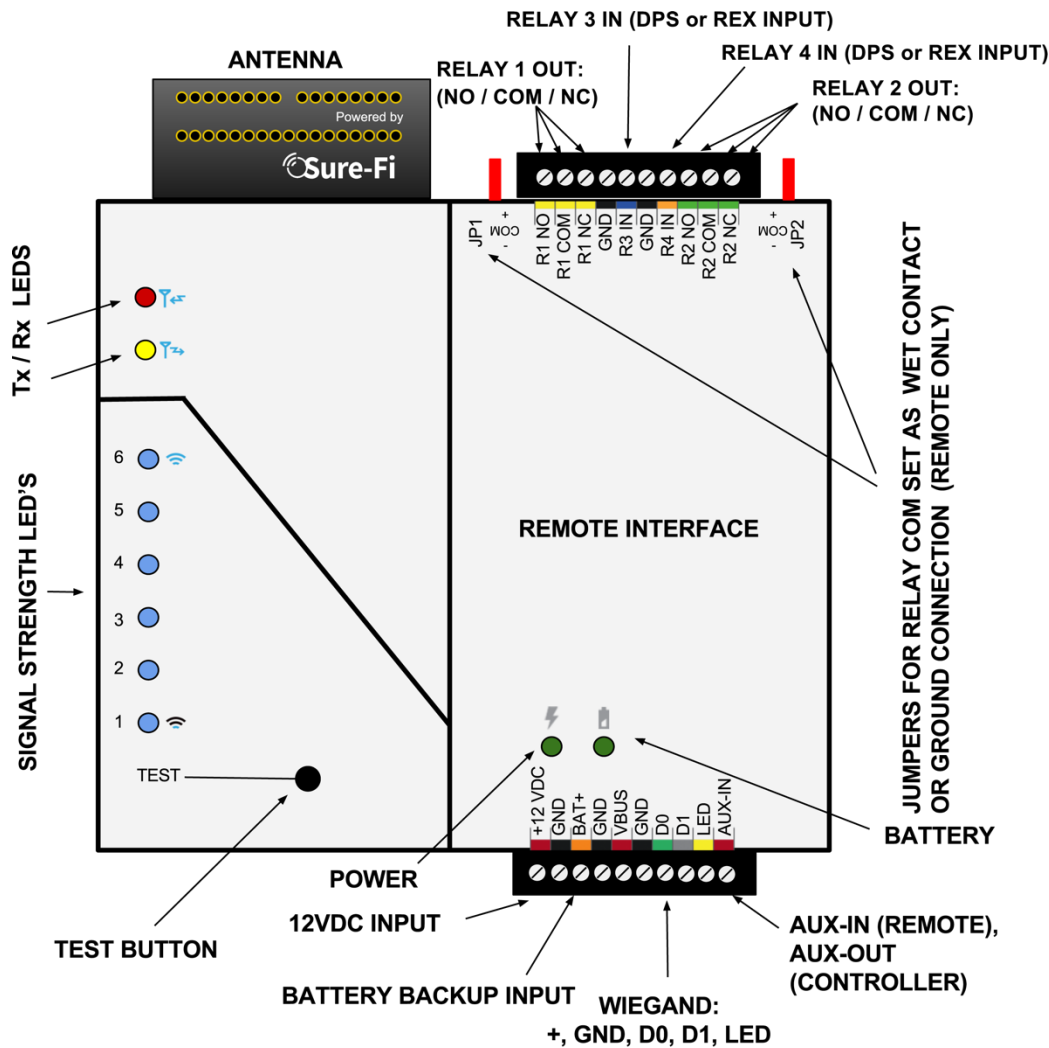
Controller Interface - Top edge connector

Position	Description
1 (right)	R4 NC: Relay 4 Normally-Closed terminal
2	R4 COM: Relay 4 Common terminal
3	R4 NO: Relay 4 Normally-Open terminal
4	R2 IN: Relay 2 control (energizes Relay 2 on paired unit)
5	GND: - DC input
6	R1 IN: Relay 1 control (energizes Relay 1 on paired unit)
7	GND: - DC input
8	R3 NC: Relay 3 Normally-Closed terminal
9	R3 COM: Relay 3 Common terminal
10 (left)	R3 NO: Relay 3 Normally-Open terminal

Remote Interface - Top edge connector

Position	Description
1 (right)	R2 NC: Relay 2 Normally-Closed terminal
2	R2 COM: Relay 2 Common terminal
3	R2 NO: Relay 2 Normally-Open terminal
4	R4 IN: Relay 4 control (energizes Relay 4 on paired unit)
5	GND: - DC input
6	R3 IN: Relay 3 control (energizes Relay 3 on paired unit)
7	GND: - DC input
8	R1 NC: Relay 1 Normally-Closed terminal
9	R1 COM: Relay 1 Common terminal
10 (left)	R1 NO: Relay 1 Normally-Open terminal

Controller Interface - Bottom edge connector

Position	Description
1 (left)	+12VDC: + DC input
2	GND: - DC input
3	BAT+: Battery backup positive terminal '+' connection. 12V Sealed Lead Acid (SLA) type battery only.
4	GND: - DC input
5	NC: Not Connected
6	GND: - DC input (Wiegand Ground connection)
7	D0: Wiegand D0 connection
8	D1: Wiegand D1 connection
9	LED: Device LED connection
10 (right)	AUX-OUT: This is an output on the CONTROLLER INTERFACE, and corresponds with the AUX-IN on the REMOTE INTERFACE, which is an input.

Remote Interface - Bottom edge connector

Position	Description
1 (left)	+12VDC: + DC input
2	GND: - DC input
3	BAT+: Battery backup positive terminal '+' connection. 12V Sealed Lead Acid (SLA) type battery only.
4	GND: - DC input
5	VBUS: + voltage output for Wiegand device (See Figure 3)
6	GND: - DC input (Wiegand Ground connection)
7	D0: Wiegand D0 connection
8	D1: Wiegand D1 connection
9	LED: Device LED connection
10 (right)	AUX-IN: This is an Input on the REMOTE INTERFACE, and corresponds with the AUX-OUT on the CONTROLLER INTERFACE, which is an output.

Jumpers JP1 and JP2 (REMOTE INTERFACE ONLY)

Jumpers JP1 / JP2 are used to connect the relay COM terminal to either GND or +VBUS. JP1 is for Relay 1, JP2 is for Relay 2. Figure 2 shows the pinout of JP1/JP2. Use the supplied Jumper to connect the common terminal to either the – GND or the + VBUS pins if required for the desired application. The + VBUS is the same voltage that is present on the power input at the +12VDC input, or if the Backup battery is in use, on BAT+. The Remote Interface is delivered with the supplied Jumpers on JP1 and JP2 set for a dry relay (COM not connected to either GND or +VBUS), see figure 3.

Figure 2: JP1 / JP2 Pinout
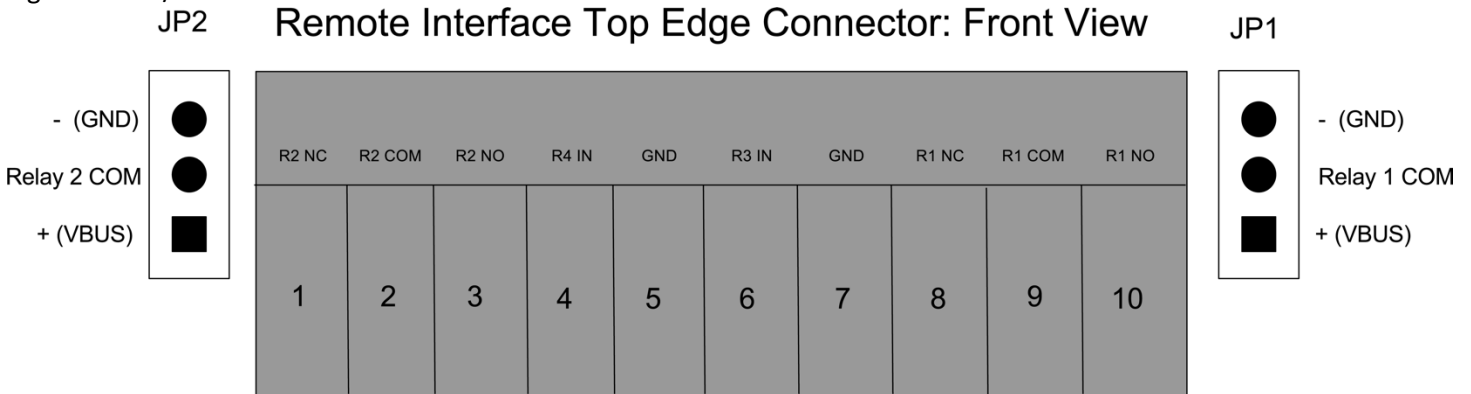
Figure 3: Diagram of Power Input, +VBUS, and JP1/JP2 functionality
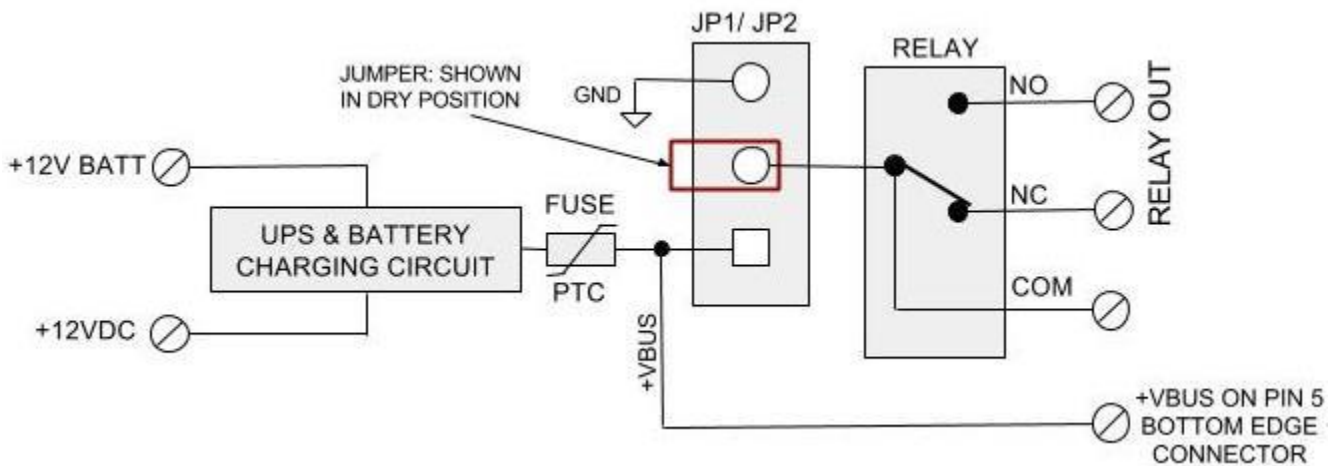
"Test" Push Button

The push button is used for two functions:

1. Range Test: Pressing and releasing the button quickly initiates the Range Test. The Range Test feature is used to test the range of the radio transceiver and displays the results of a received transmission on the LED's labeled 'Signal Strength' (1 – 6) in Figure 1.

2. Configuration: Pressing and holding the button down for 5 seconds will put the unit into Configuration mode.   Before pressing the button, see the Sure-Fi App for configuration processes and other information.

LEDS (Refer to Figure 1)

1. POWER and BATTERY LEDS: these two LED's provide power and battery input status information. See the 'LED Diagnostics' section for more information.

2. Rx LED: The Rx LED will flash once briefly when a Sure-Fi radio transmission is received.

3. Tx LED: The Tx LED will flash once briefly upon a radio transmission.

4. Signal Strength LED's: These six LED's display the received signal strength. Maximum signal strength is indicated when LED's 1 through 6 are all ON. Minimum signal strength is indicated when only LED 1 is ON.

Antenna

The radio antenna is created using copper traces on both sides of the PC Board. Use caution when handling and mounting the unit to ensure that no damage (scratches, etc) occurs to the PC Board/Antenna. Additionally, for best performance, keep cables and wiring away from the antenna and mount the unit oriented with the antenna upwards.

Providing Power to the Controller & Remote Interfaces

The Controller and Remote interfaces each require a 12VDC supply that can source 1.0 Amp. If a maglock, strike, or other device is to be powered through the wet relay, then the additional power required for those devices will need to be considered when selecting a power supply. A Battery backup can be connected as shown if required for the application.

Figure 4: Backup Battery Connection
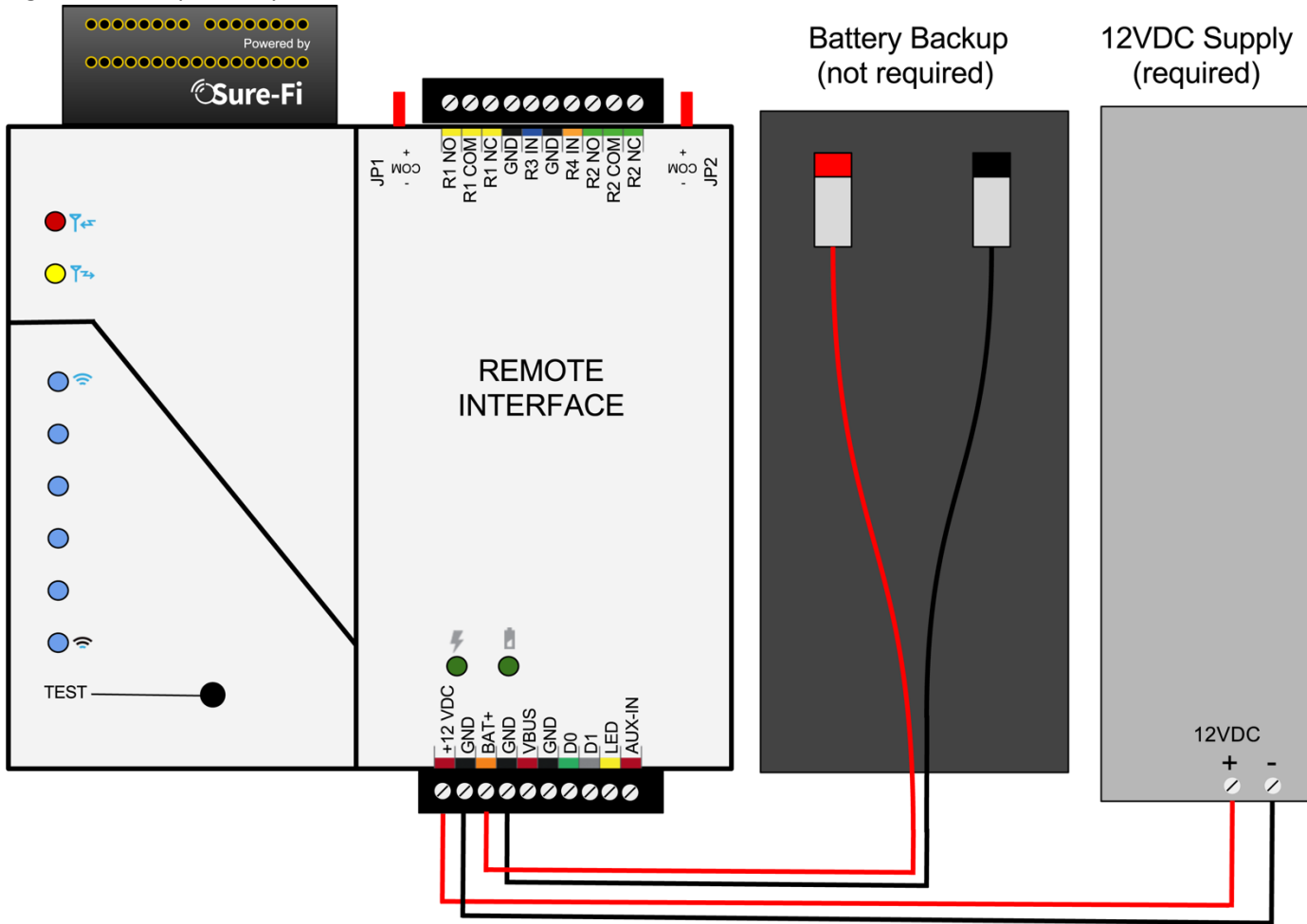
Battery Backup Charging and UPS Functionality

The Controller and Remote Interfaces both provide a charging voltage for a 12V sealed lead acid battery backup and they also have uninterruptable power supply (UPS) functionality. The UPS will automatically switch to the battery backup whenever the 12VIN wall power goes out and will then switch back to the 12VIN wall power when it returns.

Wiring Wiegand On Remote/Controller Interfaces

Figure 5: Wiegand Wiring Remote Interface

WARNING - Wiegand Device must be 12VDC Compatible
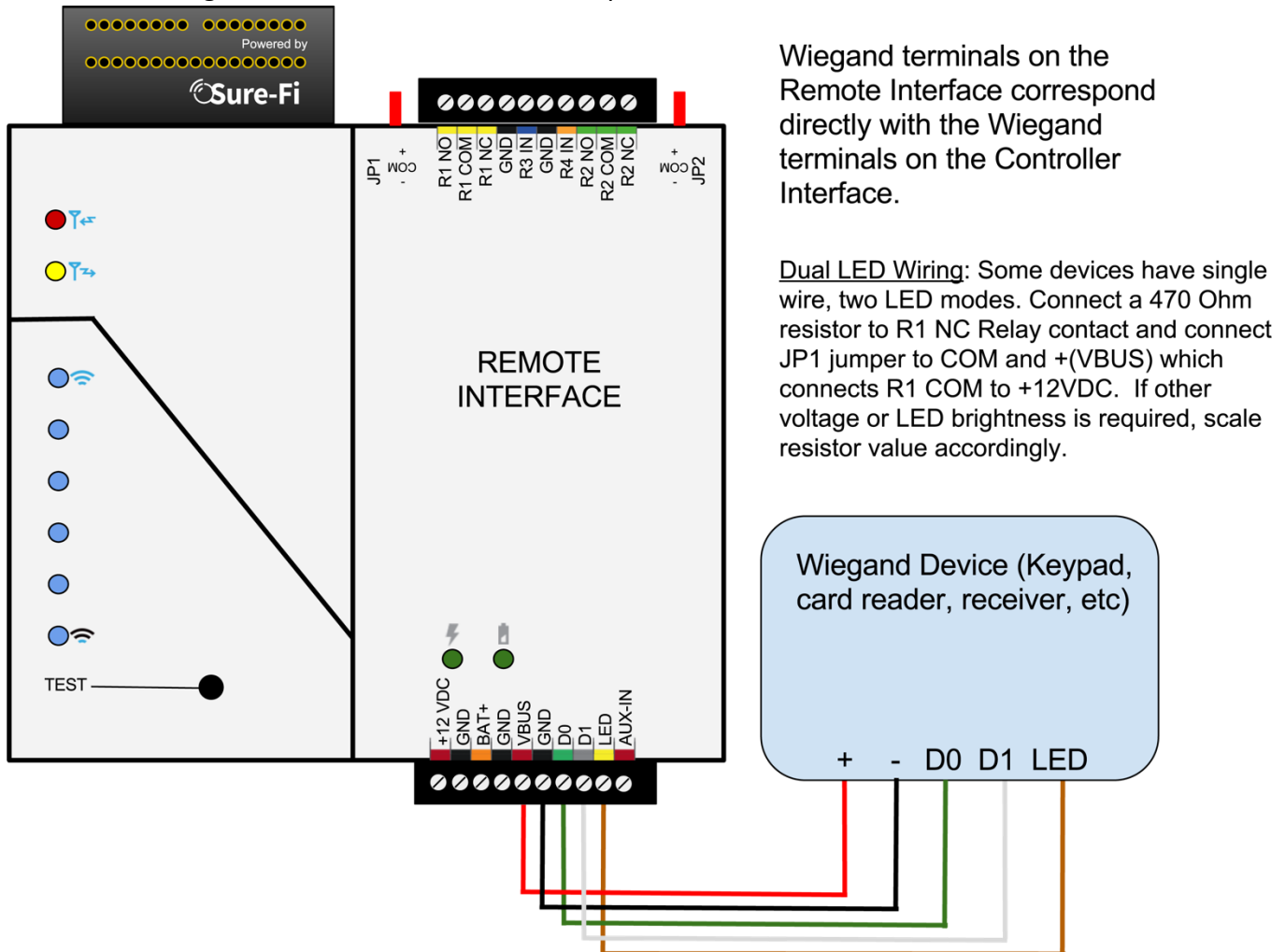
Wiegand terminals on the Remote Interface correspond directly with the Wiegand terminals on the Controller Interface.

Dual LED Wiring: Some devices have single wire, two LED modes. Connect a 470 Ohm resistor to R1 NC Relay contact and connect JP1 jumper to COM and +(VBUS) which connects R1 COM to +12VDC. If other voltage or LED brightness is required, scale resistor value accordingly.

Wiegand Device (Keypad, card reader, receiver, etc)
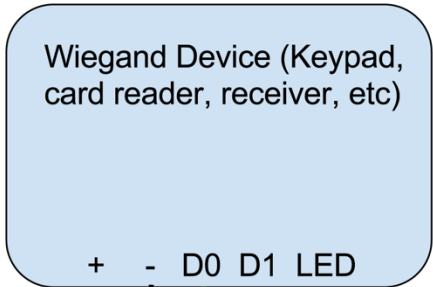
Figure 6: Wiegand Wiring Controller Interface
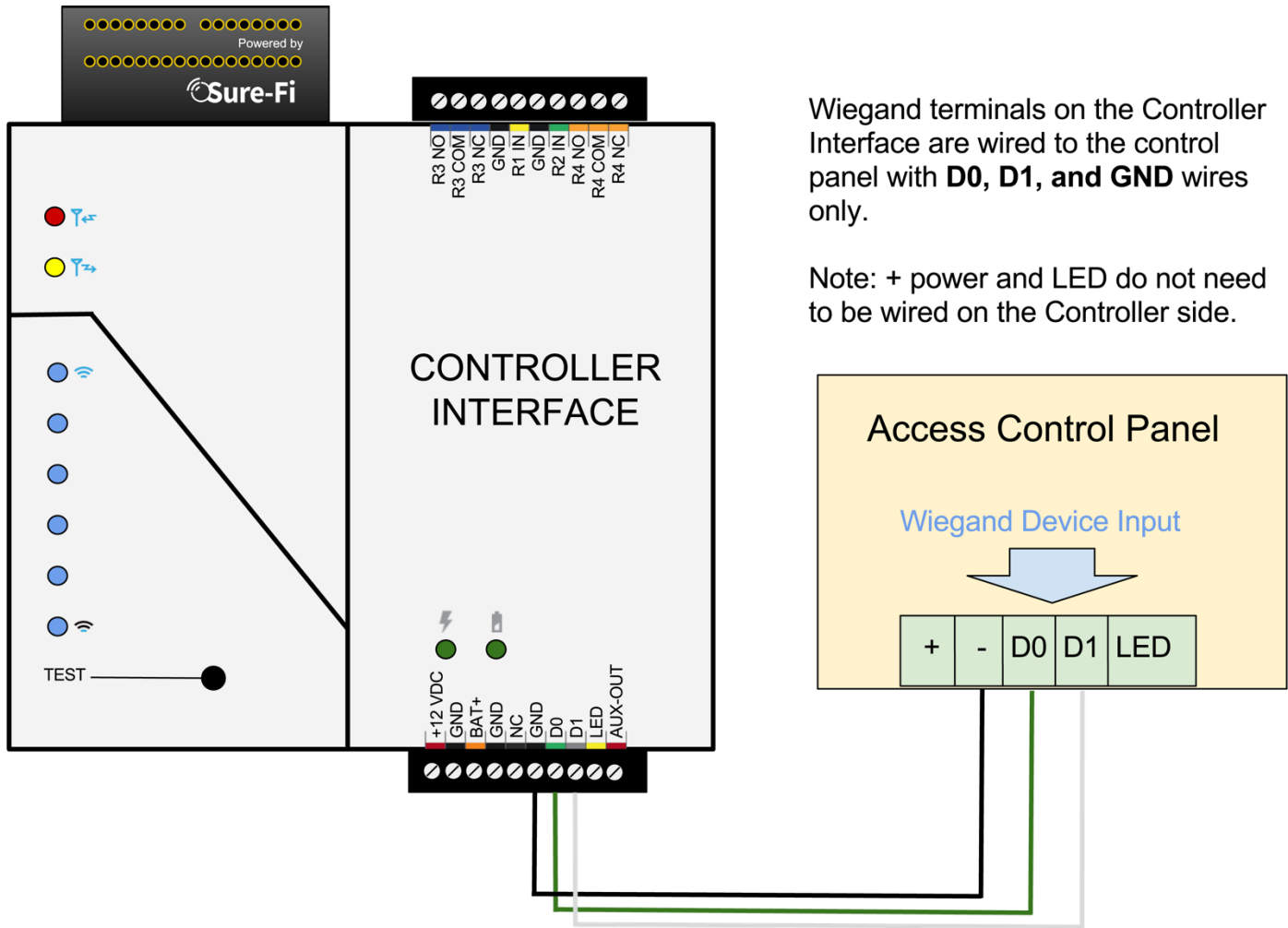
Wiegand terminals on the Controller Interface are wired to the control panel with **D0, D1, and GND** wires only.

Note: + power and LED do not need to be wired on the Controller side.

Relay 1 Wired On Remote Interface / Relay 1 In Wired On Controller Interface

Figure 7: Relay 1 Wiring Remote Interface

Relay 1 is wet contact: JP1 is connected to COM and + pins

R1 OUT

Relay 1 output on the Remote Interface corresponds directly with **R1 IN** on the Controller Interface. This device can be a maglock, electrical strike, gate operator, or other access control device. The device can be powered directly from the Remote Interface by placing Jumper JP1 to the COM and + pins creating a wet relay.

WARNING: THE PROVIDED SURGE PROTECTOR MUST BE INSTALLED AS SHOWN AS CLOSE TO THE BRIDGE CONNECTOR AS POSSIBLE – EVEN IF THERE IS A SURGE PROTECTOR ALREADY ON THE STRIKE/LATCH.

FAILURE TO COMPLY MAY RESULT IN ERRATIC BRIDGE BEHAVIOUR OR PERMANENT DAMAGE.

Figure 8: R1 IN Wiring Controller Interface
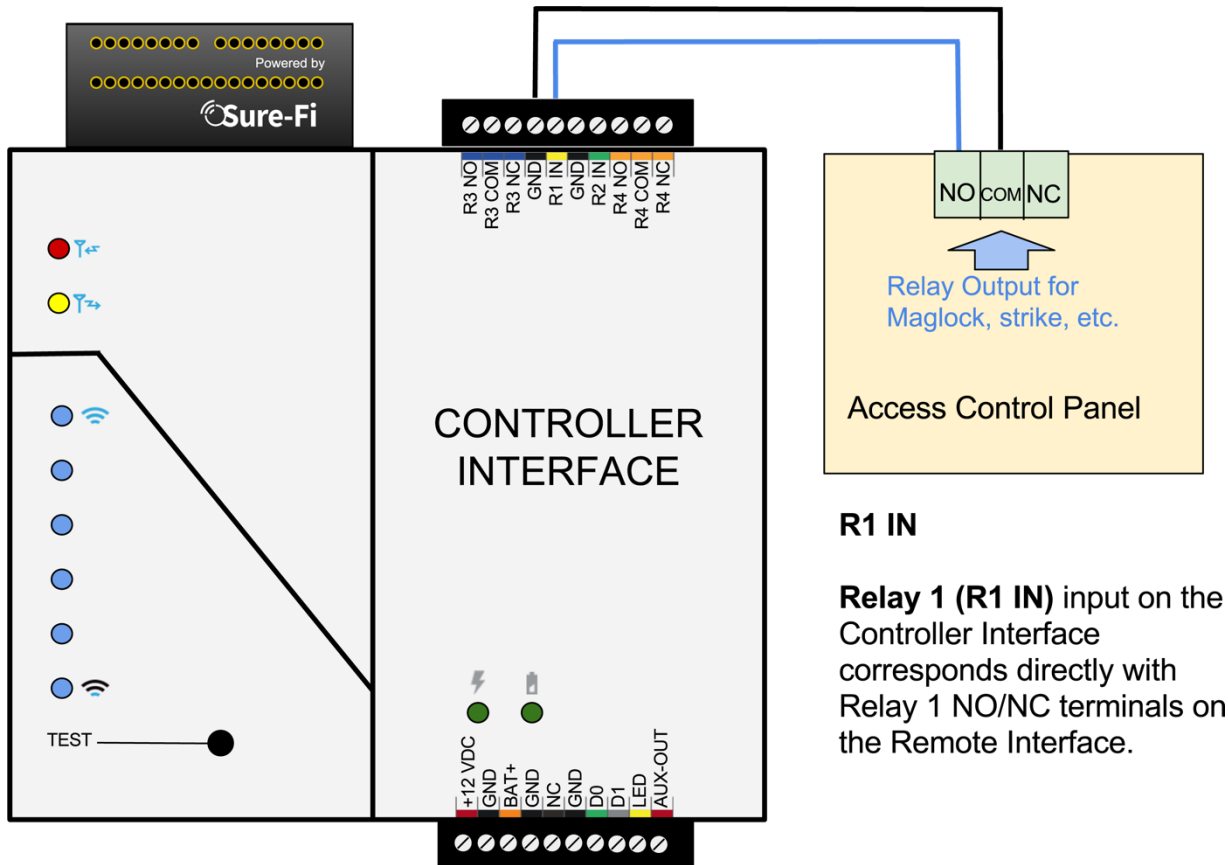
R1 IN

Relay 1 (R1 IN) input on the Controller Interface corresponds directly with Relay 1 NO/NC terminals on the Remote Interface.

Relay 3 In Wired On Remote Interface / Relay 3 Wired On Controller Interface

Figure 9: R3 IN Wiring Remote Interface

R3 IN / GND

R3 IN input on the Remote Interface corresponds directly with **Relay 3** on the Controller Interface. This input can be used for a door monitor/door position sensor, request to exit or other device needing a relay output. Use terminal **R3 IN** and **GND** to wire the device on the Remote Interface.
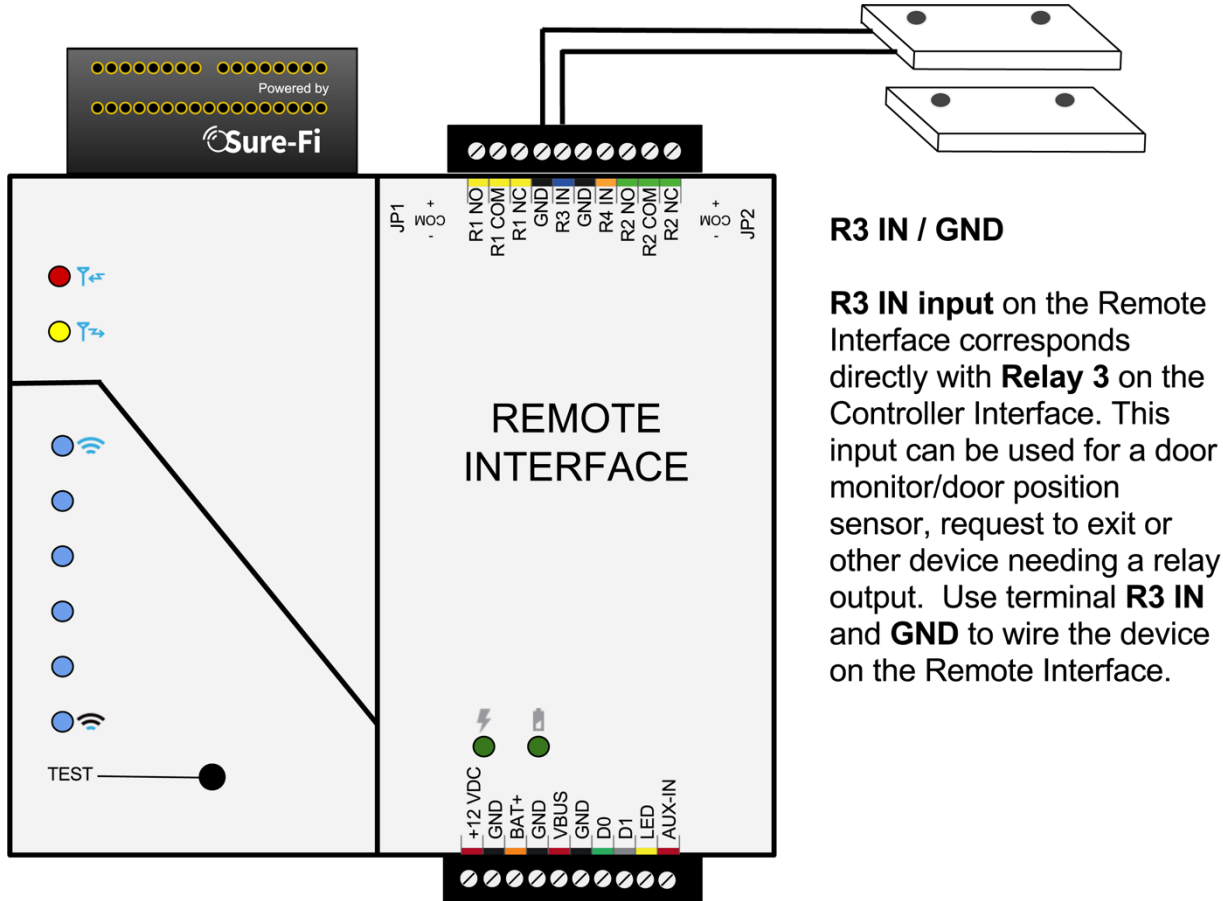
Figure 10: Relay 3 Wiring Controller Interface

R3 OUT

Relay 3 OUT on the Controller Interface corresponds directly with the device connected to **R3 IN** on the Remote Interface. This could be a Request to Exit, Door Position Sensor, or other device requiring a relay output. **R3 OUT** on the Controller Interface is wired to the appropriate input on the Access Control Panel (Door Monitor, Request to Exit, etc.)
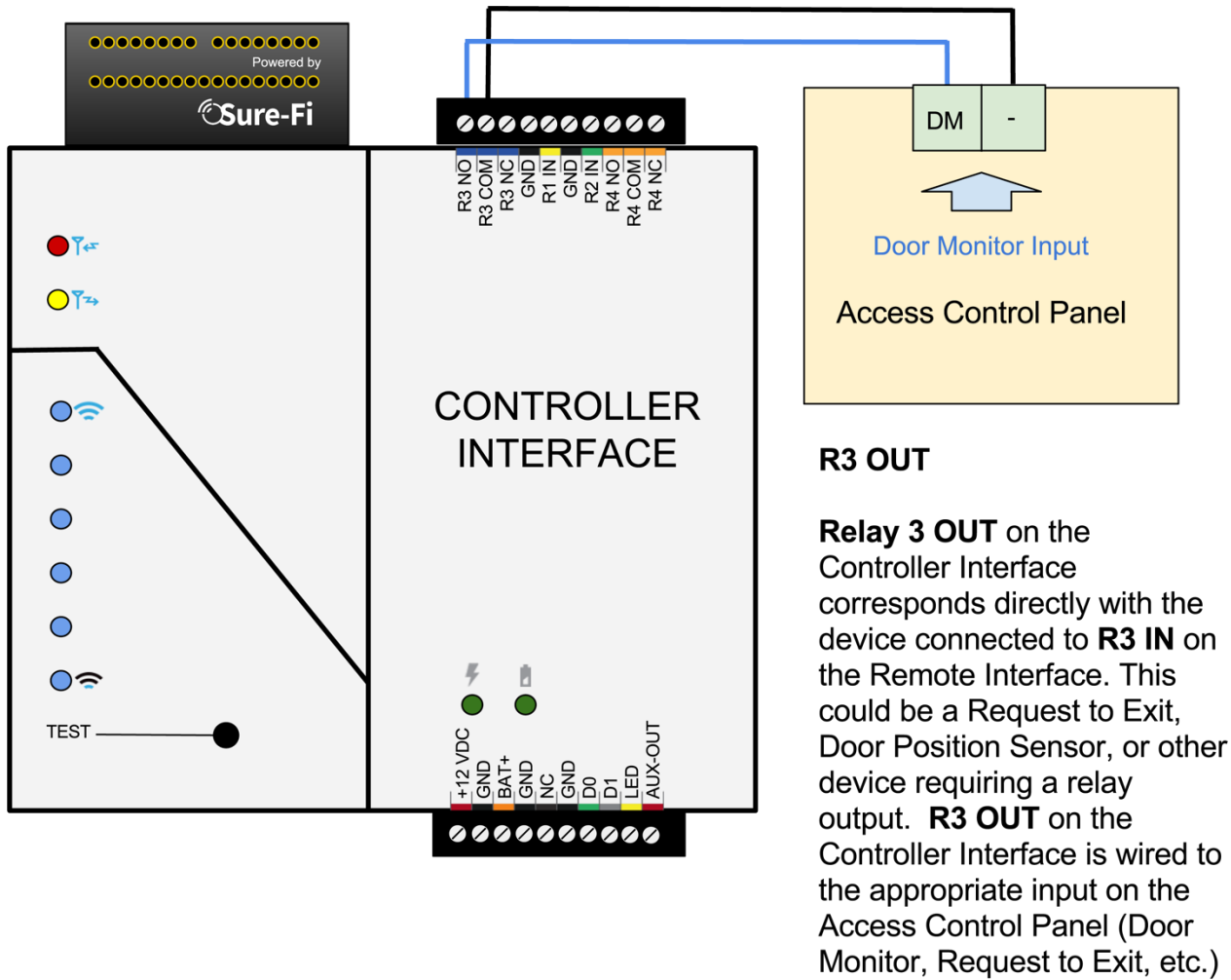
Relay 4 In Wired On Remote Interface / Relay 4 Wired On Controller Interface

Figure 11: R4 IN Wiring Remote Interface
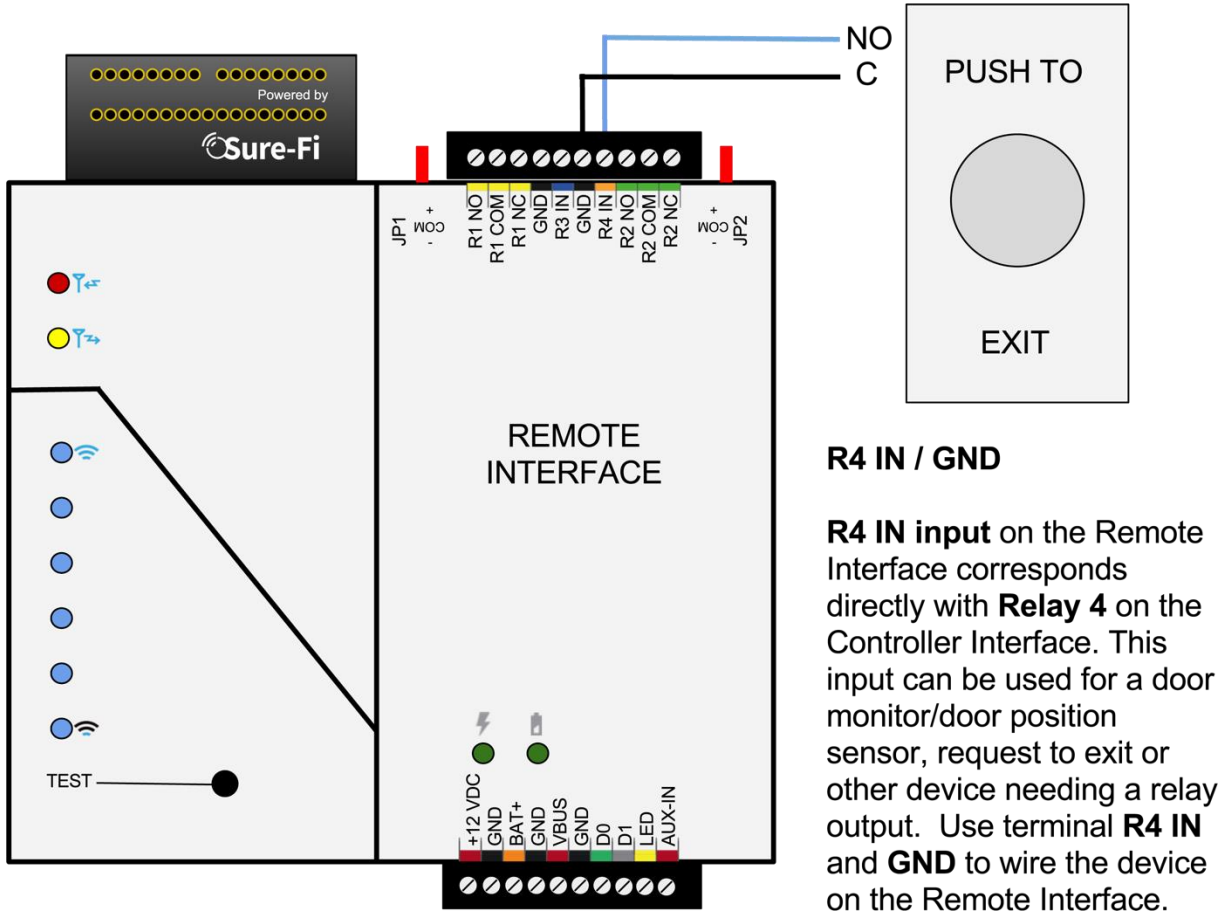
R4 IN / GND

R4 IN input on the Remote Interface corresponds directly with **Relay 4** on the Controller Interface. This input can be used for a door monitor/door position sensor, request to exit or other device needing a relay output. Use terminal **R4 IN** and **GND** to wire the device on the Remote Interface.

Figure 12: Relay 4 Wiring Controller Interface

R4 OUT

Relay 4 OUT on the Controller Interface corresponds directly with the device connected to **R4 IN** on the Remote Interface. This could be a Request to Exit, Door Position Sensor, or other device requiring a relay output. **R4 OUT** on the Controller Interface is wired to the appropriate input on the Access Control Panel (Door Monitor, Request to Exit, etc.)
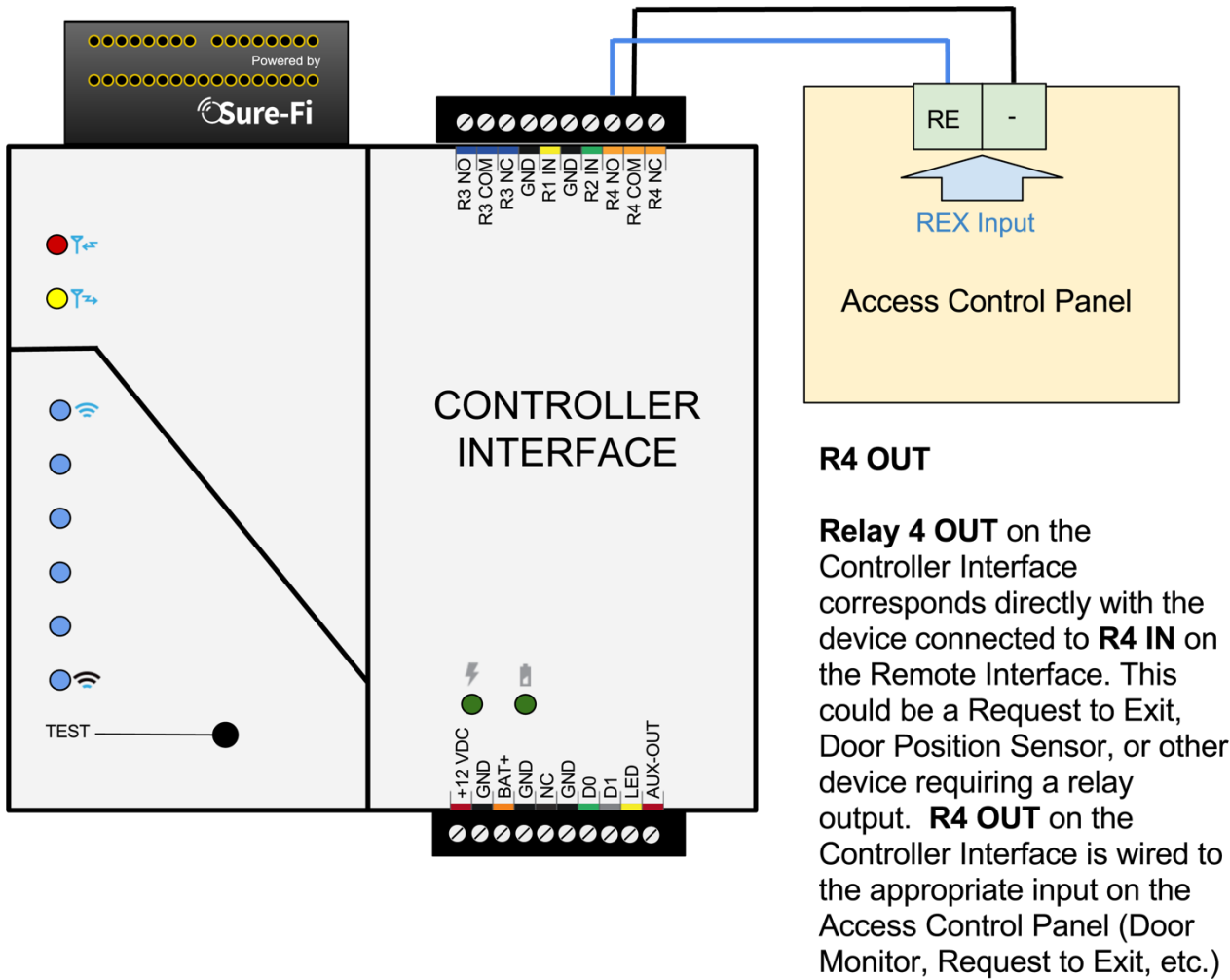
Power and Battery Led Diagnostics

The two green LED's that are labeled 'POWER' and 'BATTERY' (See Figure 1) are used to provide the status of the 12VDC input ('POWER' LED) and Battery input voltage ('BATTERY' LED). The status information is described here:

Power Status: POWER LED

LED STATE	DESCRIPTION
ON	Normal input voltage
Slow Flash (1Hz)	Input voltage low. Check for proper input voltage (12VDC)
Fast Flash (2Hz)	Input voltage high. Check for proper input voltage (12VDC)
OFF	No input power or device not functioning properly

Battery Status: BATTERY LED

LED STATE	DESCRIPTION
ON	Battery voltage normal
Slow Flash (1Hz)	Low battery voltage. Battery voltage is < 11.0VDC
Fast Flash (2Hz)	Battery voltage high. Maximum Battery voltage is 13.8VDC
OFF	No battery: battery voltage is < 1.0VDC

Mounting The Unit

There are two methods for mounting:

DIN Rail mount:
DIN rail mounting is the preferred mounting method that allows the case to easily clip and unclip from the DIN rail. Attach a piece (minimum 4" length) of 35mm type DIN rail to the wall and then snap the unit to the DIN rail or slide it on from the end. The unit will snap in to place by putting the top retaining tabs on to the DIN rail first, then pressing the bottom on to the DIN rail until it snaps in to place. To remove the unit from the DIN rail, use a small screwdriver, insert in to the bottom DIN rail clip (the single black clip) and pull gently down and outward until the unit releases from the DIN rail.

Screw mount:
The DIN rail clips on the base of the enclosure case can be snapped outward to allow for screw mounting of the case. Mount using only the single bottom black DIN clip and the top white DIN clip that is located on the side below connector P1. Do not use the DIN clip located behind the antennae.
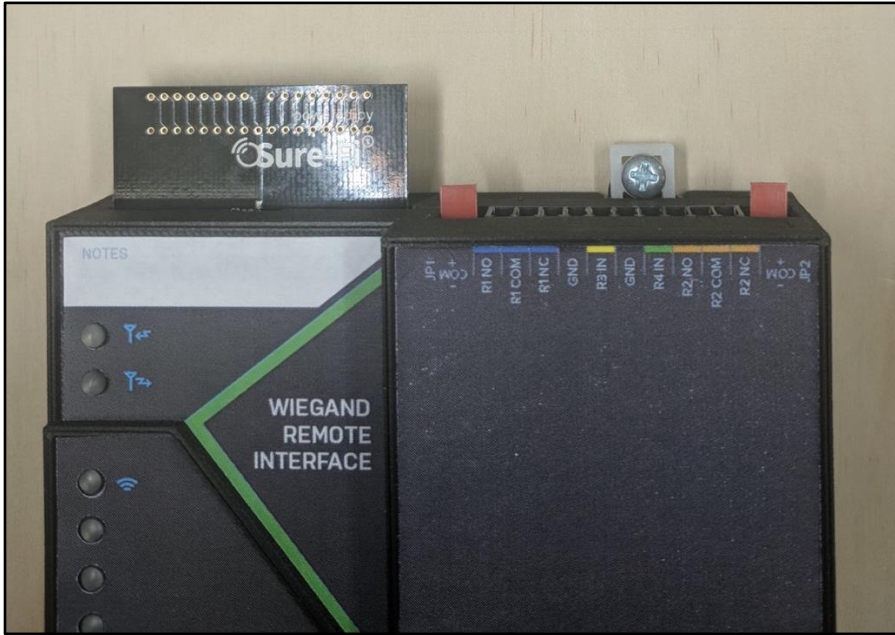
The two DIN clips are shown pressed outward and ready for screw mounting:

Figure 13: DIN Rail Mounting Pins

The top screw is shown mounted through the DIN clip to the wall:

Figure 14: Top DIN Rail Screw Mount

The bottom screw is shown mounted through the black DIN clip to the wall:

Figure 15: Bottom DIN Rail Screw Mount

Troubleshooting

If the Controller and Remote Interfaces are not communicating:

First try quickly pressing and releasing the 'Test' button on one of the units and observing the six Signal Strength LED's. If any of blue LED 1 through LED 6 LED's light up then the transmission between the two units was successful.

Another test can be attempted by presenting a credential to the Wiegand device –

Observe the Rx and Tx LEDs on either the Controller or the Remote Interface and ensure the following happens:

1. The Transmit (Tx) LED flashes.

    And immediately after

2. The Receive (Rx) LED flashes.

If you do not see the transmit and receive LED lights activate:

1. Power cycle both the Controller and Remote Interfaces, then retest.
2. Ensure that any wires and cables are routed away from the Antenna on both Controller and Remote Interfaces.
3. Ensure that Surge Protector(s) are properly installed.

For maximum range between the Controller and Remote Interfaces:

1. Power both units with their own dedicated power supply.
2. Place both units at higher locations.
3. Route all cables and wiring away from the area around the Antenna.

If successful communication occurs using the 'Test' button, but does not occur using the Wiegand device, then the problem is likely incorrect wiring to the Wiegand device or an incompatibility issue with the Wiegand device.

FCC and Industry Canada Regulatory Statements

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. Any changes or modifications not expressly approved by manufacturer could void the user's authority to operate the equipment.

IMPORTANT! Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada

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, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

IMPORTANT! Tous les changements ou modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actioner cet équipment.

47 CFR 15.105- FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/ TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

FCC Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Important Note:
Radiation Exposure Statement:
This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Note Importante: (Pour l'utilisation de dispositifs mobiles)
Declaration d'exposition aus radiations:
Cet équipement est conforme aux limites d´exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipment doit être installé et utilisé avec un mimimum de 20 cm de distance entre la source de rayonnement et votre corps.

Warranty

The warranty period of this product is 12 months run-time, beginning from first power up of the device after purchase. During this period, if the product does not operate correctly, due to a defective component, the product will be repaired or replaced at the sole discretion of Sure-Fi, Inc. This warranty does not extend to the product casing which can be damaged by conditions outside of the control of Sure-Fi, Inc.

Trademarks
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