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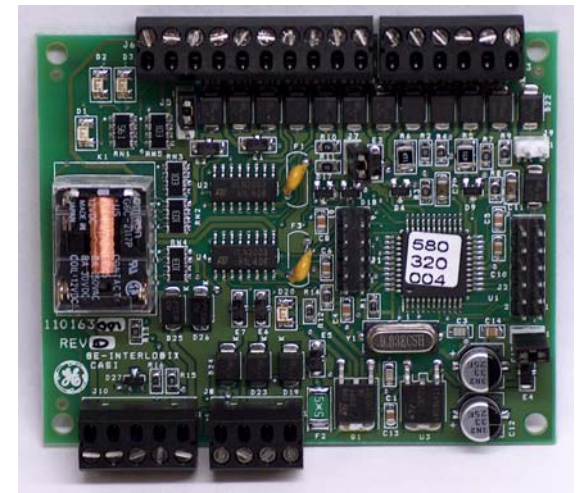
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460487001J, September 2011

Wiegand Interface Unit Four-State (WIU-4) Installation Manual



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Intended use Use this product only for the purpose it was designed for; refer to the data sheet and user documentation for details. For the latest product information, contact your local supplier or visit us online at www.utcfireandsecurity.com.

FCC compliance This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

You are cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Regulatory





2002/96/EC (WEEE directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info.

Manufacturer UTC Fire & Security

HQ and regulatory responsibility: UTC Fire & Security, 9 Farm Springs Road, Farmington, CT 06034-4065, USA

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Introduction

The Wiegand Interface Unit-Four State (WIU-4) board features a Wiegand to F/2F data converter, which can accommodate both conventional and proprietary Wiegand reader protocols, and includes an 8 Amp relay for door strike control (entrance/exit) activity. It provides the communications interface that enables support of up to 16 Wiegand-output readers.

When combined with most conventional Proximity, Mifare[®], and ISO-15693 Wiegand-output readers, the WIU-4 reports immediate alarm notification of short circuit, cut line, open circuit, or closed circuit conditions to the access control system.

Safety

Radio interference



WARNING: This is an FCC Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take adequate measures.

Electrostatic discharge (ESD) precaution



WARNING: Circuit board components are vulnerable to damage by electrostatic discharge. ESD can cause immediate or subtle damage to sensitive electronic parts. An electrostatic charge can build up on the human body and then discharge when you touch a board. A discharge can be produced when walking across a carpet and touching a board, for example. Before handling any board, make sure you dissipate your body's charge by touching ground. This discharges any static electricity build-up.

Product features

The WIU-4 provides the following:

- Conversion of multiple Wiegand formats into supervised F/2F format.
- Junction box capabilities with removable connectors for ease of wiring.
- Built-in door strike relay with surge protecting diodes.
- Red LED, green LED, and beeper control outputs.
- Supports reader tamper and external tamper inputs.
- Self-resetting fuse protection on all power and signal outputs.
- Options for supervised or unsupervised Door DI and request-to-exit (REX) DI inputs.
- Built-in surge protection circuitry for data lines.
- Four built-in LEDs to help with installation and troubleshooting.
- Supports Wiegand formats up to 64 bits.
- Supports most 8 bit keypad reader output formats.

Note: Do not use the WIU-4 with a 2SRP supervised reader processor board/microcontroller configuration.

System requirements

For UL compliant installation notes, refer to [“UL Listed Installations” on page 18](#).

| | |
|----------------------|---|
| Host software | <ul style="list-style-type: none"> Secure Perfect® Edition 3.0 or later Picture Perfect™ 1.7 or later |
| Microcontrollers | <ul style="list-style-type: none"> Micro/5-PX with 2RP or 8RP Micro/5-PXN with 2RP or 8RP M5PXNplus Micro/PX-2000 Micro/PXN-2000 M2000PXNplus M3000PXNplus |
| Reader support | <ul style="list-style-type: none"> Wiegand data output up to 64 bits Most 8 bit keypad reader output formats |
| Wiegand data formats | <ul style="list-style-type: none"> 26-bit 32-bit 35-bit Corporate 1000 37-bit 40-bit formats Custom Wiegand formats up to 64 bits |

Technical specifications

For UL compliant installation notes, refer to **"UL" on page 18.**

| | |
|--|--|
| Operating temp. range | -31°F to +150°F (-35°C to +66°C) |
| Relative humidity | 5% to 95% (non-condensing) |
| Physical dimensions (HxWxD) | 3.1" x 2.5" x 0.644" (78.74 mm x 63.50 mm x 16.35 mm) |
| Index of protection | IP00 |
| Input voltage range | 9 to 16 VDC |
| Power consumption | 40 mA @ 12 VDC (no reader attached) |
| Cable specifications* | Belden 8725 or equivalent, 20 AWG minimum |
| Maximum cabling distance WIU-4 to micro:** WIU-4 to reader:*** | 1000 ft (304.8 m) @ 12 VDC with 20 AWG cable 250 ft (76.2 m) @ 12 VDC with 20 AWG cable Note: Although the WIU4 can be installed up to 250 ft from the door, it is recommended that it be installed above the ceiling, close to the door to minimize electrical interference. |
| Door strike relay**** | 8.0 A @ 30 VDC maximum |
| Agency approvals | FCC Class A part 15 CE UL 294 |

* UTC Fire & Security recommends using shielded cable for all installations.

** WIU-4 to micro: The maximum cabling distance of 1,000 ft (304.8 meters) is influenced by wire gauge, reader power requirements, and the 12 VDC level from the microcontroller.

*** WIU-4 to reader: The maximum cabling distance of 250 ft (76.20 meters) is influenced by wire gauge, reader power requirements, minimum input voltage at the reader when using the 12 VDC from the WIU-4 (originally from the micro), and the cabling between the WIU-4 and micro.

**** The life of the relay decreases as the current switched by the contacts is increased. Use low current door strikes for high traffic doors to maximize the relay life. Use an external relay for high current applications.

Parts list

- WIU-4
- Mounting hardware kit
- Installation manual

Refer to the UTC Fire & Security product catalog for part numbers and ordering information.

Installation overview

The following is the general sequence of steps to follow when installing the Wiegand Interface Unit-4. Each step is explained in further detail in the sections that follow:

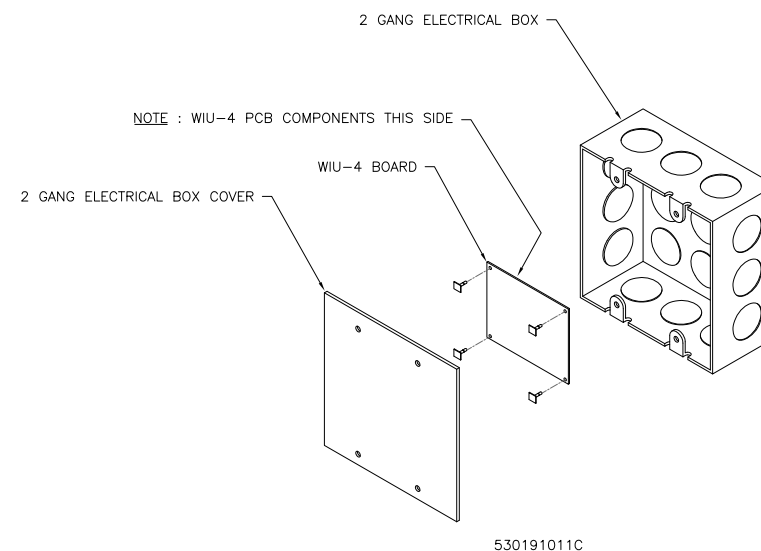
1. Mount the WIU-4.
Refer to “Mounting the WIU-4” on page 7.

Note: The WIU-4 must be mounted indoors, in a protective enclosure or standard 2-gang electrical box (Installer supplied) as shown in *Figure 1*.

2. Configure the WIU-4.
Refer to “Configuring the WIU-4” on page 8.
3. Connect the WIU-4.
Refer to “Connecting the WIU-4” on page 14.
4. Test the WIU-4.
Refer to “Testing the WIU-4” on page 17.

Mounting the WIU-4

Figure 1. Mounting instructions



1. To mount the WIU-4 board in the 2 gang electrical box, remove the electrical box cover and clean it with the alcohol wipes provided in the mounting hardware kit.
2. Apply the four standoffs, provided in the mounting hardware kit, to the four corners of the WIU-4 board, as shown in [Figure 1](#).
3. Remove the adhesive liner on the standoffs and attach the WIU-4 board to the electrical box cover, making sure the WIU-4 board does not interfere with or touch the sides of the electrical box.

Configuring the WIU-4

The WIU-4 has the following connectors and jumpers:

- **J3:** Door and REX switch connector
- **J4:** Four state door supervision jumper (Enabled)
- **J5:** Reserved. (A jumper must be installed on pins 1 and 2)
- **J6:** Reader interface connector
- **J7:** Tamper switch connector
- **J8:** Micro interface connector
- **J9:** Reserved
- **J10:** Door strike relay connector



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* IF THE TAMPER FEATURE IS NOT USED, A JUMPER MUST BE INSTALLED ACROSS PINS 8 AND 9.

J3: Door and REX switch connector

The 6-pin connector, J3, is the door and REX switch interface.

If the door or REX switch is set up as supervised (1K resistor in series with switch between high and return pins, 1K in parallel with switch), the WIU-4 treats both the door and REX switch as supervised and reports four states: cut line, short circuit, closed circuit, and open circuit.

Note: To enable four-state supervision for the door and the REX, install a jumper at position J4. Both points must be terminated with resistors as shown in [Figure 4](#) on page 15. If supervision is required for only one (the door or the REX), then also insert a 1K resistor across J3, pins 3 and 4 or pins 5 and 6, as applicable.

If the door or REX is not set as supervised, the adapter reports two states: open when there is no connection between the high and return pins, or closed when a short exists between high and return pins.

Table 1. J3 Door and REX switch connector

| PIN | Description |
|-----|--|
| 1 | Power 12 VDC fused power, 250 mA maximum |
| 2 | Ground |
| 3 | Door (high) 5 VDC output |
| 4 | Door (return) 0-5 VDC input |
| 5 | REX (high) 5 VDC output |
| 6 | REX (return) 0-5 VDC input |

J4: Door and REX supervision connector

The 2-pin connector, J4, is the door and REX supervision connector. By default, a jumper is installed on pins 1 and 2 to enable 4-state supervision. Remove the jumper to disable 4-state supervision and enable 2-state supervision.

J5: Reserved

The 3-pin connector, J5, is reserved. A jumper must be installed across pins 1 and 2.

J6: Reader interface connector

The 10-pin connector, J6, is the reader interface connector.

If a tamper switch is desired, connect a single-pole, single-throw (SPST), normally-closed push button switch (installer supplied) to connector J6, pins 8 and 9 on the WIU-4. When used with a Micro/5-PX, Micro/5-PXN, M5PXNplus, Micro/PX-2000, Micro/PXN-2000, M2000PXNplus, or M3000PXNplus, the WIU-4 sends a supervised reader alarm message.

Table 2. J6 Reader interface connector

| PIN | Description |
|-----|--|
| 1* | Power 12 VDC fused power to reader, 250 mA maximum |
| 2 | Ground |
| 3 | Wiegand DATA 0, normally at 5 VDC |
| 4 | Wiegand DATA 1, normally at 5 VDC |
| 5 | Green LED switches to ground during door unlock time |
| 6 | Red LED switches to ground to activate the red LED. |
| 7 | Signal switches to ground to activate the beeper |
| 8** | Tamper Select 0 VDC = no tamper open = tamper |
| 9** | Tamper Common (ground output) |
| 10* | Power 5 VDC non-fused power to reader |

* Use pin 1 or pin 10 for reader power, not both.

** If the tamper feature is not used, a jumper must be installed across pins 8 and 9.

J7: Tamper switch connector

The 2-pin connector, J7, can be used to connect a tamper switch to protect the enclosure in which the WIU-4 is mounted. To activate this feature, connect a single-pole, single-throw (SPST), normally-open push button switch (installer supplied) to connector J7 on the WIU-4 and install the switch in the desired position. When used with a Micro/5-PX, Micro/5-PXN, Micro/PX-2000, or Micro/PXN-2000, the WIU-4 sends a tamper alarm message.

By default, a jumper is installed across these pins to disable the external tamper feature. Remove the jumper to enable this feature.

Table 3. J7 Tamper switch connector

| PIN | Description |
|-----|-------------------------|
| 1 | Switch contact (Source) |
| 2 | Switch contact (Return) |

Note: If the external tamper feature is not used, a jumper must be installed across these two pins. Otherwise, the WIU-4 will report a tamper condition to the microcontroller.

J8: Micro interface connector

The 4-pin connector, J8, is the Micro interface connector.

Table 4. J8 Micro interface connector

| PIN | Description |
|-----|--------------------------------|
| 1 | Power 12 VDC (power for WIU-4) |
| 2 | Ground |
| 3 | Door DO |
| 4 | Reader F/2F data |

J9: Reserved

The 2-pin connector, J9, is reserved.

J10: Door strike relay connectors

The 5-pin connector, J10, is the door strike relay connection.

Table 5. J10 Door strike relay connector

| PIN | Description |
|-----|------------------------------|
| 1 | Relay power (Source) |
| 2 | Relay power (Return) |
| 3 | Normally closed (NC) contact |
| 4 | Not used |
| 5 | Normally open (NO) contact |

LED indicators

The four green LEDs on the board provide visual indication of the system interfaces.

Table 6. LED indicators

| LED | Description |
|-----|----------------|
| D1 | DI monitor LED |
| D2 | F/2F data LED |
| D3 | Door DO LED |
| D20 | Power LED |

Refer to [“Indicators” on page 17](#) for LED status indicators and definitions

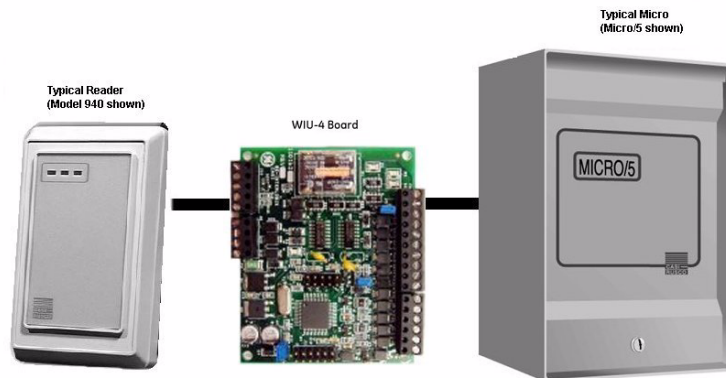
Connecting the WIU-4

Connect the WIU-4 between the microcontroller and access control reader as indicated in [Figure 3](#).



WARNING: It is important to ensure all connections are made prior to applying power.

Figure 3. Sample WIU-4 configuration



Wiring diagrams

Figure 4. WIU-4 to Micro/5 8RP board

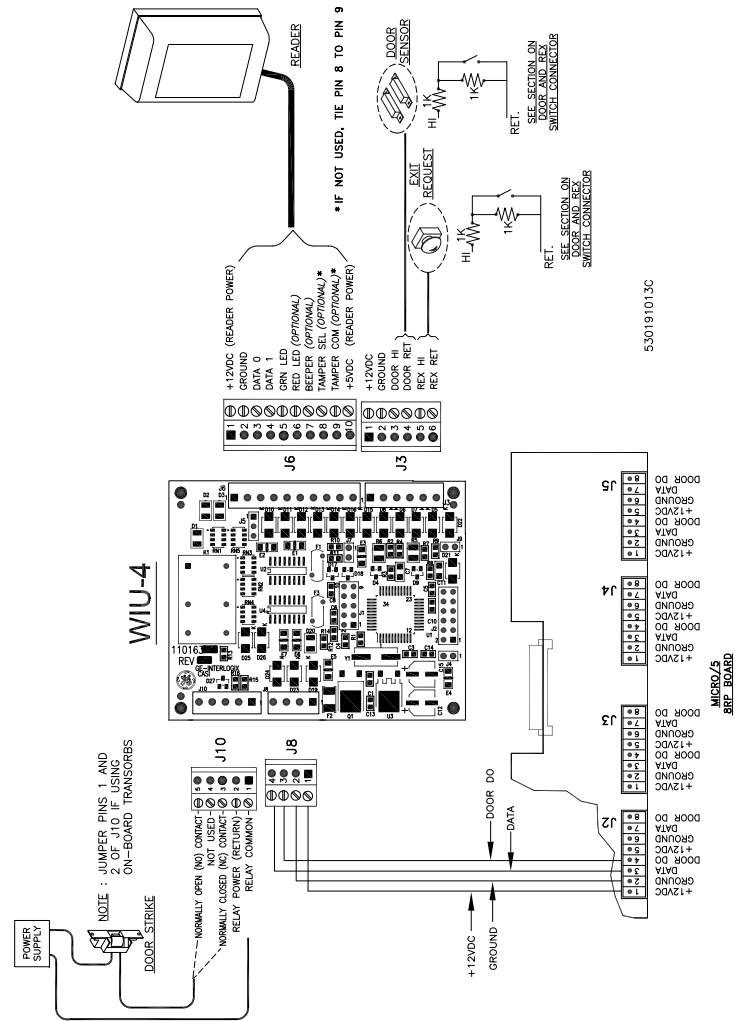
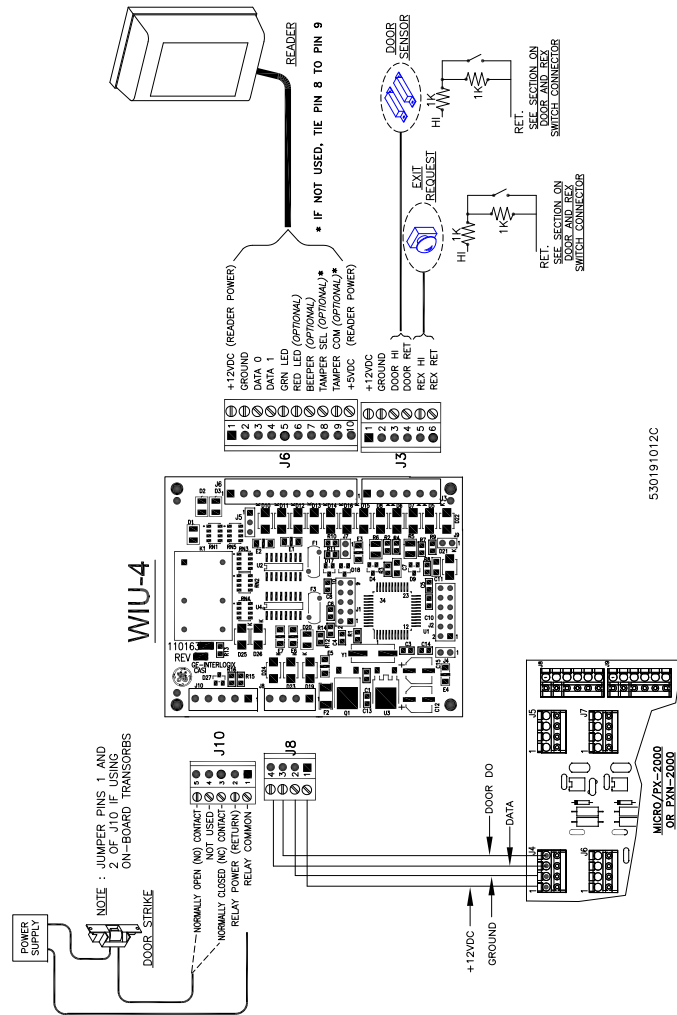


Figure 5. WIU-4 to Micro/PX-2000, PXN-2000, or M2000PXNplus interface



Testing the WIU-4

1. Verify reader (J6), door/REX (J3), door strike (J10), and micro (J8) connections are properly wired.
2. If the tamper connections on connector J6 are not used, pin 8, Tamper Select, and pin 9, Tamper Common, must be connected together. Otherwise, tamper alarms will be generated.
3. Refer to the [Table 7](#) to verify proper operation.
4. If the reader does not function, be sure to install a jumper across pins 1 and 2 of J5.

Indicators

The WIU-4 has four green LEDs that operate as indicated in the following table.

Table 7. Green LED indicator status

| LED | Operation |
|-----|---|
| D1 | DI Monitor LED ON = door switch is reporting that the door is closed. OFF = door switch is reporting the door is open. The LED works the same regardless of whether the switch is supervised or not. |
| D2 | F/2F Data LED Pulses ON for a short time, approximately every 3 seconds, indicating that the WIU-4 is sending "I'm alive" messages on the F/2F data output. It also pulses ON once for every badge read and once for a DI status change. |
| D3 | Door DO LED ON = Door DO output from the micro is active. |
| D20 | Power LED ON = board has 12 VDC power connected. |

Troubleshooting the WIU-4

If the operation of a component is in doubt, substitute a known good component and retry the system.

Always verify wiring against the wiring diagrams before powering up the system.

Regulatory approvals

UL



The following are the results of the UL evaluation of the WIU-4:

- Operating temperature range: +32°F to +120°F (+0°C to +49°C)
- Relative humidity: 85%
- Input voltage range: 9 to 16 VDC, 55 mA or higher to ensure the measured 60 mA is within 110% of the current rating.
- For UL Listed installations, the WIU-4 must be mounted within the protected area of a protective enclosure.

CE



MANUFACTURERS DECLARATION OF CONFORMITY For

Product identification:

Model/type : WIU-4 BOM revision level : D
 Category (description) : Interface Board
 Brand :

Manufacturer:


UTC Fire & Security,
Americas Corp., Inc
3211 Progress Dr.
Lincolnton, NC 28092
USA

EU Representative:

UTC Fire & Security B.V.
Kelvinstraat 7
6003 DH Weert
The Netherlands

| Concerning | RTTE | | |
|--|--|--------|--|
| | EMC | Safety | Radio |
| A sample of the product has been tested by: | PSE 12955 Bellamy Brothers Blvd. Dade City, FL 33525 | | PSE 12955 Bellamy Brothers Blvd. Dade City, FL 33525 |
| Test report reference | 07F255I | | 02F466C |
| Applied standards | EN50130-4(1995) +A1(1998) +A2(2003) | | EN 55022 (2006) |

Equipment class identifier (RF products falling under the scope of R&TTE)

☒ Not Applicable ☐ None (class 1 product) ☐  (class 2 product)

Means of conformity

We declare under our sole responsibility that this product is in conformity with Directive 1999/5/EC (R&TTE), 2004/108/EC (EMC), 2006/95/EC (LVD), and 93/68/EEC (Marking) based on test results using harmonized standards in accordance with the Directives mentioned

Signature of representative/manufacturer:

Rafael Martinez
Compliance Leader, Access
791 Park of Commerce Blvd, Suite 100
Boca Raton, FL 33487

Place : Boca Raton
Date : 11 June 2011

Model listing (list of all product variants or models for which this declaration is valid)

| Model | BOM revision level |
|-------|-------------------------------------|
| WIU-4 | Wiegand Interface Unit, 430160001 D |

Signature of representative/manufacture:



Place : Boca Raton
Date : 11 June 2011

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