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The Wiegand Interface Unit - Two State (WIU-2) board is installed between a controller and an access control reader. When users present their credential (card, key fob, fingerprint, etc.) to the reader, the WIU-2 converts Wiegand badge identification (BID) data into the F/2F protocol and sends it to the controller. The access control system then grants or denies access to the secure location.

The Wiegand Interface Unit-Two State (WIU-2) board features a Wiegand data converter, which can accommodate both conventional and proprietary Wiegand reader protocols, and includes a 2 Amp relay for door strike control (entrance/exit) activity. With the WIU-2 card, any organization can quickly add a wide range of Magnetic Stripe, Wiegand, Proximity, Mifare®, and Biometric readers to any UTC Fire & Security access control system.

To minimize installation efforts, the door contact and request-to-exit (REX) input circuitry connects directly to the WIU-2 to avoid the high cost of home-running cables back to the controller.
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-2 is designed to provide the following functions:

- Supports a wide range of Magnetic Stripe, Wiegand, Proximity, Mifare, and Biometric readers that employ Wiegand data formats
- Converts both traditional and custom Wiegand BID formats to F/2F supervised protocol
- Centralizes wiring connections for remote access control readers, door strike hardware, door contact, and request-to-exit (REX) circuitry
- Includes a heavy-duty 2 Amp door strike relay
- Supports up to 24 VAC or 30 VDC door strikes
- Connector compatible with popular 2-state interface adapters

Note: The WIU-2 does not support keypad reader output formats.
# System requirements

For UL compliant installation notes, refer to "UL Listed Installations" on page 16

| Host software                  | • Secure Perfect® Edition 3.0 or later  
|                               | • Picture Perfect™ 1.7 or later  
|                               | • FCWnx  
| Controllers                   | • M5PX with 2RP or 8RP  
|                               | • M5PXN with 2RP or 8RP  
|                               | • M5PXNplus with 2RP or 8RP  
|                               | • M2000PX  
|                               | • M2000PXN  
|                               | • M2000PXNplus  
|                               | • M3000PXNplus with 2RP or 8RP  
| Readers                        | Formats up to 40 bits  
| Wiegand data formats          | • 26-bit  
|                               | • 32-bit  
|                               | • 35-bit Corporate 1000  
|                               | • 37-bit  
|                               | • 40-bit formats  

[Image of the table]
## Technical specifications

For UL compliant installation notes, refer to “UL” on page 16.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating temp. range</strong></td>
<td>-32°F to +150°F (-35°C to +66°C)</td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
<td>5% to 95% (non-condensing)</td>
</tr>
<tr>
<td><strong>Physical dimensions (HxWxD)</strong></td>
<td>3.25” (82.55 mm) x 1.85” (46.99 mm) x 0.644” (16.35 mm)</td>
</tr>
<tr>
<td><strong>Index of protection</strong></td>
<td>IP00</td>
</tr>
<tr>
<td><strong>Input voltage range</strong></td>
<td>9 to 16 VDC</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>25 mA @ 12 VDC (no reader attached)</td>
</tr>
<tr>
<td><strong>Cable specifications</strong></td>
<td>Belden 8725 or equivalent, 20 AWG minimum</td>
</tr>
<tr>
<td><strong>Maximum cabling distance</strong></td>
<td></td>
</tr>
<tr>
<td>WIU-2 to controller:b</td>
<td>1000 ft (304.8 m) @ 12 VDC with 20 AWG cable</td>
</tr>
<tr>
<td>WIU-2 to Reader:c</td>
<td>250 ft (76.2 m) @ 12 VDC with 20 AWG cable</td>
</tr>
<tr>
<td><strong>Door strike relay</strong></td>
<td>2.0 A @ 30 VDC maximum</td>
</tr>
<tr>
<td><strong>Agency approvals</strong></td>
<td>FCC Class A part 15, CE, UL 294</td>
</tr>
</tbody>
</table>

a. UTC Fire & Security recommends using shielded cable for all installations.
b. WIU-2 to Controller: 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 controller.
c. WIU-2 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-2 (originally from the controller), and the cabling between the WIU-2 and controller.
d. The life of the relay decreases as the current switched by the contacts is increased. Use low current door strikes to maximize the relay life. Use an external relay for high current or high traffic applications.
Parts list

• WIU-2
• 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-2. Each step is explained in further detail in the sections that follow:

1. Mount the WIU-2.
   Refer to Mounting the WIU-2 on page 7.

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

2. Configure the WIU-2.
   Refer to Configuring the WIU-2 on page 8.

3. Connect the WIU-2.
   Refer to Connecting the WIU-2 on page 12.

4. Test the WIU-2.
   Refer to Testing the WIU-2 on page 15.
Mounting the WIU-2

Figure 1. Mounting instructions

1. To mount the WIU-2 board in the single gang electrical box, first 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-2 board, as shown in Figure 1.

3. Remove the adhesive liner on the standoffs and attach the WIU-2 board to the electrical box cover, making sure the WIU-2 board does not interfere with or touch the sides of the electrical box.
Configuring the WIU-2

The following connectors and jumpers make up the Wiegand Interface Unit-2:

- **J1**: Reader Interface Connector
- **J2**: Controller Interface Connector
- **J3**: 2-State Reporting Connector
- **J5**: Reserved
- **J6**: HID™ Reader Supervision
Figure 2. WIU-2 connectors and jumpers
J1: Reader interface connector

The 10 pin connector J1 is the reader interface connector. J1 is used to connect a Wiegand output device to the WIU-2.

Table 1. J1: Reader interface connector

<table>
<thead>
<tr>
<th>PIN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Door ground (return)</td>
</tr>
<tr>
<td>2</td>
<td>Door input</td>
</tr>
<tr>
<td>3</td>
<td>REX ground (return)</td>
</tr>
<tr>
<td>4</td>
<td>REX input</td>
</tr>
<tr>
<td>5</td>
<td>Wiegand Data 1</td>
</tr>
<tr>
<td>6</td>
<td>Wiegand Data 0</td>
</tr>
<tr>
<td>7</td>
<td>Door DO/LED control</td>
</tr>
<tr>
<td></td>
<td>Used to control door strike and activate green LED</td>
</tr>
<tr>
<td>8</td>
<td>Beeper</td>
</tr>
<tr>
<td></td>
<td>Signal switches to ground to activate the beeper</td>
</tr>
<tr>
<td>9</td>
<td>Ground</td>
</tr>
<tr>
<td>10</td>
<td>12 VDC fused power, 250 mA maximum</td>
</tr>
</tbody>
</table>
J2: Controller interface connector

The 7-pin connector J2 is the controller interface connector. J2 is used to connect controller power and data signals to the WIU-2.

Table 2. J2: Controller interface connector

<table>
<thead>
<tr>
<th>PIN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 VDC power for WIU-2</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Door DO/LED control</td>
</tr>
<tr>
<td></td>
<td>Used to control door strike and activate green LED</td>
</tr>
<tr>
<td>4</td>
<td>Reader F/2F Data</td>
</tr>
<tr>
<td>5</td>
<td>Strike NC</td>
</tr>
<tr>
<td>6</td>
<td>Strike Common</td>
</tr>
<tr>
<td>7</td>
<td>Strike NO</td>
</tr>
</tbody>
</table>

J3: Two-state reporting connector

The 2-pin connector J3 is the 2-state reporting connector. By default, this connector is jumpered to enable 2-state reporting. Remove the jumper to disable 2-state reporting.

J5: Reserved

The 2-pin connector J5 is reserved.

J6: HID reader supervision

The 2-pin connector J6 is the HID reader supervision connector. By default, this connector is not jumpered and HID reader supervision is disabled. Place a jumper over this connector to enable HID reader supervision.
Connecting the WIU-2

Connect the WIU-2 between the controller and access control reader as indicated in Figure 3.

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

Figure 3. Sample WIU-2 configuration
Connecting the WIU-2

Wiring diagrams

Figure 4. WIU-2 to M588P Interface

- Use stranded wire where possible.
- Use plenum rated cable for applications where cable is to be run above the false (suspended ceiling) or in the air circulation space.

Provide current restriction device, less than 2 Amps through Controller Relay.

1. Install 1N5817 Blocking Diode as shown. Locate away from reader on secure side of door.
2. Connect wire to the appropriate pin on the WIU-2.
3. Connect wire to the appropriate pin on the J1 connector.
4. Connect wire to the appropriate pin on the J2 connector.

See strike manufacturer's installation instructions for conductor size AWG.
Figure 5. WIU-2 to M2000PX or M2000PXN Interface

- Install 1N4148 Blocking Diode as shown. Locate away from reader on secure side of door.
- See strike manufacturer’s installation instructions for conductor size AWG.
- Connect protection device across strike.
- Strike: +1, -1
- Strike Power Supply: +12 VDC, +12VDC

Diagram details:
- Signal Name: Pin
- +12 VDC: 1
- Ground: 2
- Data: 3
- Door DO: 4
- Strike Relay NC: 5
- Strike Relay CC: 6
- Strike Relay NC: 7

Use 20 AWG * shielded cable

Cable splice to Reader port

Door or Exit DI’s

* Use plenum rated cable for applications where cable is to be run above the false suspended ceiling in the air circulation space.

53304040A
Testing the WIU-2

1. Verify the reader (J1) and controller (J2) connections are properly wired.

2. Verify that jumpers J3, J5, and J6 are set properly.

3. If a communications error occurs, when connected to a supervised HID reader, verify that jumper J6 has been removed.

4. If an incorrect badge ID (BID) displays on the host, check for crossed lines between the WIU-2 and the reader. See Figure 4, “WIU-2 to M5 8RP Interface,” on page 13. or Figure 5, “WIU-2 to M2000PX or M2000PXN Interface,” on page 14., as appropriate.

5. Do not jumper or short DO/LED (located on J2-pin3) to the Pin light (located on connector J1-pin7). For proper LED and pin light operation, wire as shown in Figure 4 and Figure 5 using diode provided.
Troubleshooting the WIU-2

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

UL Listed Installations

The following are the results of the UL evaluation of the WIU-2 readers:

- Operating temperature range: +32°F to +120°F (+0°C to +49°C)
- Relative humidity: 85%
- For UL Listed installations, the WIU-2 must be mounted within the protected area of a protective enclosure.
MANUFACTURERS DECLARATION OF CONFORMITY

For

Product identification:

Model/type: WIU-2
BOM revision level: A
Category (description): Interface Board

Manufacturer: UTC Fire & Security, Americas Corp., Inc
3111 Progress Dr.
Lincolnton, NC 28092
USA

EU Representative: UTC Fire & Security B.V.
Kelvinstraat 7
6033 DH Weert
The Netherlands

Concerning RTTE Safety Radio

A sample of the product has been tested by:
PSE: PSE Bellamy Brothers Blvd.
Dade City, FL 33525
PSE: PSE Bellamy Brothers Blvd.
Dade City, FL 33525

Test report reference: 07F2401 07F2480

Applied standards


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

Page 1 of 2
### Model listing (list of all product variants or models for which this declaration is valid)

<table>
<thead>
<tr>
<th>Model</th>
<th>BOM revision level</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIU-2</td>
<td>2-state Wiegand Interface Unit, 430187001</td>
</tr>
</tbody>
</table>

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