Digital Energy
MDS

# MDS WiYZ Remote
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## 1.0 INTRODUCTION

The GE MDS WiYZ platform allows the connection of process sensors to a wireless network. Wirelessly networked sensors allow monitoring and control of equipment and processes without the infrastructure requirements of a hard-wired system. The WiYZ platform's IP65 Outdoor Rating allows installation of the gateway and remotes outdoors, if required.

In addition to these instructions, the *MDS WiYZ System Reference Manual* (05-4954A01) provides helpful guidance on WiYZ systems and menus. Also refer to the *MDS WiYZ Gateway Quick Start Guide* (05-4888A01). Electronic copies of all user documents and data sheets are available free of charge at **www.GEmds.com**.

### 1.1 WiYZ Remote

The WiYZ Remote is an industrial wireless solution for monitoring signals from directly connected sensors and other signaling devices. It provides robust, versatile communications even in harsh environments and at sites with limited power and communication facilities.

The unit's self-contained design allows for quick installation and deployment without the need for additional accessories. The WiYZ Remote automatically determines communication routes with the WiYZ Gateway.



**Figure 1. WiYZ Remote**

## 1.2 Typical Application

The WiYZ system allows the user to connect a network of sensors wirelessly, and to access collected sensor data through a variety of backhaul WAN interfaces.

The WiYZ Remotes monitor analog signals from directly connected sensors and other signaling devices, such as warehouse video cameras, tank level sensors, and OEM instruments.

## 1.3 Hardware Input/Output Configurations

You can order the WiYZ Remote with four different hardware I/O configurations:

### 1.3.1 TRNR_PRD-72

This device supports a low voltage I/O set:
- Two digital inputs (0 -5 VDC to 24 VDC)
- Two digital outputs (2 A at 24 VDC)
- Two analog voltage inputs (0-100 mV)
- One 6 V (40 mA) sensor power supply output

### 1.3.2 TRNR_PRD-74

This device supports a high voltage I/O set:
- Two digital inputs (0 -5 VDC to 24 VDC)
- Two digital outputs (2 A at 24 VDC)
- Two analog voltage inputs (0-5 V)
- One 6 V (40 mA) sensor power supply output

### 1.3.3 TRNR_PRD-77

This device supports a current input I/O set:
- Two digital inputs (0 -5 VDC to 24 VDC)
- Two digital outputs (2 A at 24 VDC)
- Two analog current inputs (0-22 mA)
- One 24 V (40 mA) sensor power supply output

### 1.3.4 TRNR_PRD-78

This device supports a current output I/O set:
- Two digital inputs (0 -5 VDC to 24 VDC)
- Two digital outputs (2 A at 24 VDC)
- Two analog current outputs (4-20 mA)
- One 24 V (40 mA) sensor power supply output

## 2.0 HARDWARE INSTALLATION

Refer to for component locations.

### 2.1 COM1 (J602) RS232 Diagnostic Pinouts

| RJ11 Pin | Signal | Direction |
| --- | --- | --- |
| 4 | Transmit Data (TXD) | Output |
| 5 | Receive Data (RXD) | Input |
| 6 | Ground (GND) | Input |

## 2.2 COM2 (J601) RS232/RS485 Payload Pinouts

| RJ45 Pin | Signal | Direction |
|---|---|---|
| 2 | Receive Data (RXD) | Output |
| 3 | Transmit Data (TXD) | Input |
| 5 | Ground (GND) | Input |
| 7 | Request to Send (RTS) | Input |
| 8 | Clear to Send (CTS) | Output |

## 2.3 BATT (J208) Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 1 | Vbatt+ | Output |
| 2 | Vbatt- | Input |

## 2.4 Terminal Strip (J201) Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 1 | Digital Input 1 (D_IN1)[1,2] | Input |
| 2 | Digital Input 2 (D_IN2)[1,2] | Input |
| 3 | Digital Input Common | Input |
| 4 | ISO Ground (Isolated GND) | Input |
| 5 | Digital Output 1 (D_OUT1)[1,2] | Output |
| 6 | Digital Output 2 (D_OUT2)[1,2] | Output |
| 7 | Digital Output Common (D_OUT_COMMON)[1,2] | Output |
| 8 | Ground (GND) | Input |
| 9 | Volt Input 1/Current Input 1+/Current Output 1+[1] *Refer to* Section 2.4.1 through Section 2.4.6. | Input/Output |
| 10 | Volt Input 2/Current Input 1-/Current Output 1-[1] *Refer to* Section 2.4.1 through Section 2.4.6. | Input/Output |
| 11 | Ground (GND) | Input |
| 12 | Volt Output 1/Current Input 2+/Current Output 2+[1] *Refer to* Section 2.4.1 through Section 2.4.6. | Input/Output |
| 13 | Volt Output 2/Current Input 2-/Current Output 2-[1] *Refer to* Section 2.4.1 through Section 2.4.6. | Input/Output |
| 14 | Power In | Input |
| 15 | Ground (GND) | Input |
| 16 | Sensor Power | Output |

Footnotes:

1. All I/O has ESD protection.
2. Digital I/O is optically isolated from the sources with >1500 V isolation.
   **Digital Input** – Accepts voltage input from either 5 VDC to 24 VDC, the digital inputs are interruptible, and these inputs can wake up the Remote.
   **Digital Output** – Can sink current 2 A @ 24 VDC, but cannot source any voltage.

## 2.4.1 Digital Input Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 1 | Digital Input 1 | Input |
| 2 | Digital Input 2 | Input |
| 3 | Isolated Ground | Input |

## 2.4.2 Digital Output Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 5 | Digital Output 1 | Output |
| 6 | Digital Output 2 | Output |
| 7 | Digital Output Common | Output |

## 2.4.3 Analog Input Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 9 | Voltage In 1 | Input |
| 10 | Voltage In 2 | Input |

## 2.4.4 Analog Output Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 12 | Voltage Out 1 | Output |
| 13 | Voltage Out 2 | Output |

## 2.4.5 Current Input Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 9 | Current In 1+ | Input |
| 10 | Current In 1- | Input |

## 2.4.6 Current Output Pinouts

| Pin | Signal | Direction |
|---|---|---|
| 9 | Current Out 1+ | Output |
| 10 | Current Out 1- | Output |

## 2.5 Additional Remote PCB Component Information

Refer to Figure 2 on Page 3 for component locations.

- On/Off switch (SW201) – Use this switch to enable/disable power to the unit. Units with a battery ship from the factory with this switch in the OFF position.
- Antenna mount (N-Connector) is certified for use with omni-directional antennas (up to 5 dBi gain) and Yagi antennas (up to 10 dBi gain).
- Fuse (FH501) is a 2 A fuse.
- LED Ribbon Cable Connector (J604) is under the battery bracket.
- Status Switch (SW600) – Use this switch to wake the Remote, Activate the LEDs, and send a diagnostic message to the WiYZ Gateway.

## 2.6    WiYZ Remote Installation

Refer to Figure 3 during these steps, as required:

1. Attach the antenna. The antenna N-connector is certified for use with omni-directional antennas (up to 5 dBi gain) and Yagi antennas (up to 10 dBi gain). An appropriate Yagi antenna is the Maxrad MYP24010PT (MDS P/N: 97-4278A01).

2. **Mount the WiYZ Remote units.** Can be mounted using a wall mount plate, a pole mount, or strapped to a mast. Descriptions of available accessories TBS.

3. **Connect the analog cable from the sensor to be monitored to the I/O connector.** For more information, refer to 2.4 Terminal Strip (J201) Pinouts on Page 2.

4. **For units with a battery, put Switch SW201 in the ON position.** Units with a battery ship from the factory with SW201 in the OFF position.

5. **Connect optional AC power to the Remote units.** The WiYZ Remote requires 7 to 30 Vdc. Additional details TBS.
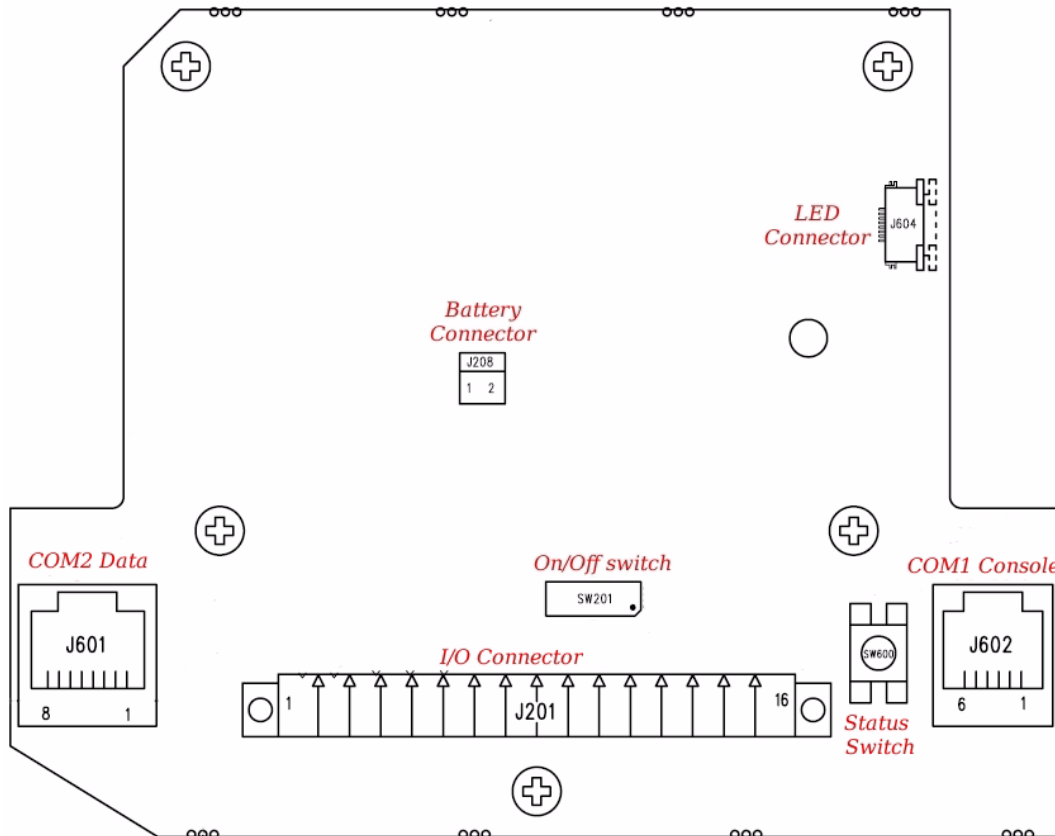


**Figure 2. WiYZ Remote PCB**

# 3.0    SOFTWARE CONFIGURATION

1. Change the security settings of the WiYZ Remote: Need some specific console commands in this section.

    a. Connect a serial cable.

    b. Change the network join key to match the value entered at the WiYZ Gateway.

    c. Enter EUI-64 of WiYZ Gateway System Manager.

    d. Enter IPv6 of the WiYZ Gateway.

    e. Enter SubNet ID of the WiYZ Gateway System Manager.

    f. Enter Linear Calibration for all attached sensors, if required. Refer to the *MDS WiYZ System Reference Manual* (05-4954A01) for more information.

2. Check for normal operation, using the front panel LEDs. You might need to press the Reset button to activate the LEDs. Refer to In-Service Operation on Page 4.

3. Close the lid and secure the 1/4-turn captive screws.



**Figure 3. WiYZ Remote Cabling**

# 4.0   IN-SERVICE OPERATION

In-service operation of the WiYZ Remote is completely automatic. The only operator actions required are to apply power and check the front panel LEDs for proper indications as described below.



**Figure 4. LED Status Indicators**

| LED Name | Function |
|---|---|
| Power | • Off: No power to unit<br>• On/Green: Powered and active<br>• Slow Blink/Green: Sleep state<br>• Slow Blink/Red: Battery Low<br>• Fast Blink/Green: Battery charging (if rechargeable battery installed)<br>• Fast Blink/Red: Alarmed |
| Link | • OFF: Not connected to any network<br>• SOLID: Connected to a network<br>• Blink: In the process of connecting |
| Signal | • Off: Not joined to any network<br>• On: Signal Strength and channel good<br>• Slow Blink: Low RSSI<br>• Fast Blink: Channel overuse (packet loss) |
| Data | • OFF: no input or output configured<br>• ON: at least one input or output configured<br>• BLINK: activity (blink for 10 seconds following last activity) |

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# 5.0   TROUBLESHOOTING

If trouble occurs, verify that the unit meets the basic requirements listed below. These items should be checked prior to starting any detailed troubleshooting, or calling for factory assistance. All installations must have:

- Adequate and stable primary power
- Secure cable connections
- Proper setup of the associated WiYZ Gateway (menu settings, correct cable wiring, proper data format, timing, etc.).

## 5.1   LEDs

The radio's LED indicator panel provides useful information when troubleshooting WiYZ remote problems. Refer to Figure 4 for LED data.

## 5.2   Technical Assistance

Factory technical assistance is available by contacting GE MDS during business hours (8:30 AM to 6:00 PM Eastern Time). Please use one of the following means to contact the factory:

Telephone: (585) 241-5510
E-mail: GEmds.TechSupport@GE.com
Web: www.GEmds.com
FAX: (585) 242-8369

**FCC Part 15 Notice**

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. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

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.

**RF Exposure Notice**

The equipment described in this guide emits radio frequency energy. Although the power level is low, the concentrated energy from a directional antenna may pose a health hazard.  To  comply with rf exposure  requirements the  antenna must be installed to ensure a minimum separation distance of 20cm from persons and may not be collocated or operated with other transmitting devices.
This guide is intended for use by a *professional installer*.

**Only approved antennas may be used on the unit's RF output connectors, as listed below. The use of non-approved antennas may result in a violation of FCC rules, and subject the user to FCC enforcement action.**

| Connector | Approved Antennas |
|---|---|
| N-Connector | Yagi: 97-4278A01<br>Omni: 97-4278A48<br>Panel: 97-4278A16 |
| *To be Supplied* | *To be Supplied* |

*Warning: Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.*