

Introduction



- Supports up to 16 THUW1103 Temperature Transmitters
- Long distance range (up to 5 Km LoS)
- 1sec network refresh time
- RS485 interface with Modbus protocol
- Transmitters battery status and RF link quality information

The Tekon Electronics WGW1104 Wireless Modbus Gateway is specifically designed to meet the most rigorous requirements of operation in the industrial process environments. Due to their reduced dimensions they can be easily installed in junction boxes or in the control cabinet.

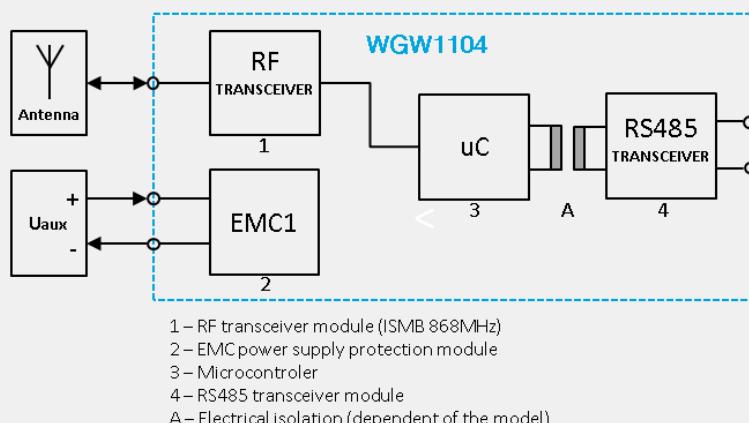
The WGW1104 Wireless Modbus Gateway receives the information transmitted by the THUW1103 Universal Wireless Temperature Transmitters and makes it available on the RS485 interface with Modbus protocol. Each WGW1104 Wireless Modbus Gateway supports up to 16 THUW1103 transmitters ensuring a network refresh time less than one second. For each THUW1103 transmitter is provided the following information in the Modbus registers: sensor temperature, ambient temperature, RF signal strength (RSSI), battery level, sensor probe type, transmission interval and information life time. The configuration parameters like the sensor probe type and transmission interval can be easily configured using the OTA - Over The Air setup and configuration function.

All the configurations needed, can be easily made through the dip switches on the front panel of the device or through the RS485 interface.

Key features

- Supports up to 16 THUW1103 Temperature Transmitters
- Long distance range communication (up to 5 Km *Line of Sight*)
- Real time transmission of sensor probe temperature, ambient temperature, RF signal strength and battery level.
- 1 second network refresh time
- High measurement accuracy
- Sensor status monitoring
- RS485 interface with Modbus protocol
- Over The Air setup and configuration
- On site battery and RF signal strength verification

Block diagram



Technical specifications

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Input Power supply | | Casing | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage supply | 24 V DC | Material | PA - UL 94 V0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input RF transmission | | Color | RAL 7035 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Transmission frequency | 868 MHz (Europe) 902 MHz (USA) | Weight | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Transmission interval | 60 ms per remote node | Dimentions | See "Dimensional drawings" | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum output power | 10 dBm | Cross-section of cables | 2.5 mm ² | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensitivity | -110 dBm | Protection type | IP40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Open air range | | Antenna connection | SMA connector | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Standard version | 500 m LoS | Ambient conditions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High Power version | 5 Km LoS | Ambient temperature range | | Ambient temperature range | -20 to 80 °C (-4 a 176 °F) | Storage temperature range | | Storage temperature range | -20 to 80 °C (-4 a 176 °F) | Relative humidity | | Relative humidity | ≤ 95 %, without condensation | Output RS485 interface | | Certificates and approvals | | Protocol | Modbus | EN 61326 | Electrical equipment for measurement, control and laboratory use. EMC requirements. | Baud rate | -20 to 80 °C (-4 a 176 °F) | IEC 61000-4-2 | Electrostatic discharge immunity test | Relative humidity | ≤ 95 %, without condensation | IEC 61000-4-3 | Radiated, Radio-Frequency, Electromagnetic Field Immunity Test | Galvanic isolation | | IEC 61000-4-4 | Electrical fast transient/burst immunity test | Factory settings | | IEC 61000-4-5 | Surge Immunity Test | Net ID | 0x01 | | | RS485 address | 0x01 | | | Baud rate | 19200 KBps | | | Sensor probe type | 2 (Pt100 - 3 wires) | | | Sensor transmission interval | 30 s | | |
| Ambient temperature range | | Ambient temperature range | -20 to 80 °C (-4 a 176 °F) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Storage temperature range | | Storage temperature range | -20 to 80 °C (-4 a 176 °F) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relative humidity | | Relative humidity | ≤ 95 %, without condensation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output RS485 interface | | Certificates and approvals | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Protocol | Modbus | EN 61326 | Electrical equipment for measurement, control and laboratory use. EMC requirements. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Baud rate | -20 to 80 °C (-4 a 176 °F) | IEC 61000-4-2 | Electrostatic discharge immunity test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Relative humidity | ≤ 95 %, without condensation | IEC 61000-4-3 | Radiated, Radio-Frequency, Electromagnetic Field Immunity Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Galvanic isolation | | IEC 61000-4-4 | Electrical fast transient/burst immunity test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Factory settings | | IEC 61000-4-5 | Surge Immunity Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Net ID | 0x01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RS485 address | 0x01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Baud rate | 19200 KBps | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensor probe type | 2 (Pt100 - 3 wires) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sensor transmission interval | 30 s | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Modbus Holding Register Table

| Description | Sensor temp. | Transmission interval | Sensor probe type | Battery level | RSSI | Information life time | Ambient temp. |
|---------------|----------------------------|-----------------------|-------------------|------------------|------------------|-----------------------|------------------|
| Variable type | UINT32 | UINT32 | UINT16 | UINT16 | UINT16 | UINT32 | UINT16 |
| Address | Node Offset ⁽¹⁾ | Node Offset + 18 | Node Offset + 20 | Node Offset + 21 | Node Offset + 22 | Node Offset + 23 | Node Offset + 25 |
| Example: | Node ID = 5 | Node Offset = 104 | | | | | |
| Address | 104 | 122 | 124 | 125 | 126 | 127 | 129 |

(1) Node Offset = [(NodeID - 1) x 26]

| Sensor probe type | Code | | |
|-------------------|------|------------------|----|
| PT100 - 2 Wires | 1 | PT1000 - 4 Wires | 9 |
| PT100 - 3 Wires | 2 | TC K | 10 |
| PT100 - 4 Wires | 3 | TC J | 11 |
| PT500 - 2 Wires | 4 | TC T | 12 |
| PT500 - 3 Wires | 5 | TC S | 13 |
| PT500 - 4 Wires | 6 | TC R | 14 |
| PT1000 - 2 Wires | 7 | TC N | 15 |
| PT1000 - 3 Wires | 8 | TC B | 16 |
| | | TC E | 17 |

Connection elements and connectors

1. Select the Node ID and Net ID. The Net ID must have the same value configured in the receiver WGW1104. The Node ID must be unique for each Net ID.
2. Connect the temperature probe according to the electrical connections diagram.
3. Connect the power supply according to the electrical connections diagram.
4. Press the test button.
5. The THUW1102 will show the RSSI value in the status leds.
6. Next THUW1102 will show the value of the selected Node ID for confirmation.
7. Next THUW1102 will show the value of the selected Net ID for confirmation.

Selection and ordering data

| Image | Partnumber | Partname |
|-------|-------------------------|--|
| | PA110040100 | WGW1104 Wireless Modbus Gateway |
| | PA110060100 | WGW1104HP Wireless Modbus Gateway (High Power) |
| | Accessories | |
| | | 866MHz antenna with 3 m cable and SMB cable connector |
| | | SMB to SMA 0,1 m cable extension |
| | Related products | |
| | PA110030100 | THUW1103 Universal Wireless Temperature Transmitter |
| | PA110050100 | THUW1103HP Universal Wireless Temperature Transmitter (High Power) |

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⁽¹⁾ Tekon is a registered trademark of Bresimar Automação S.A.