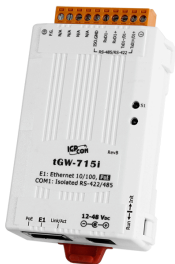




tGW-712



tGW-700 Series



tGW-700-T Series

Tiny Modbus/TCP to RTU/ASCII Gateway

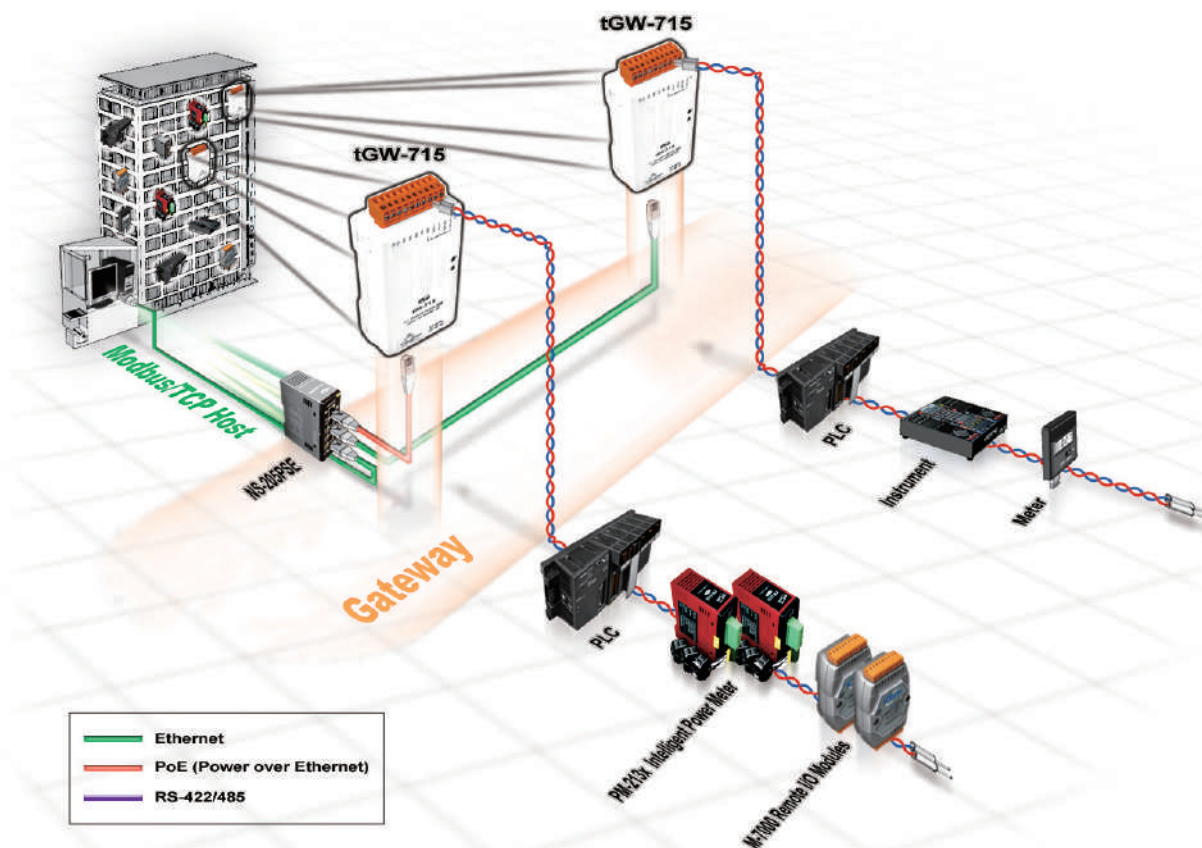
Features

- Supports Modbus TCP/UDP master and slave
- Supports Modbus RTU/ASCII master and slave
- Max. TCP connections (masters) per serial port: 32
- Read-cache ensures faster Modbus TCP/UDP response
- Supports UDP responder for device discovery (UDP Search)
- Static IP or DHCP network configuration
- Tiny Web server for serial and network configuration (HTTP)
- Allows automatic RS-485 direction control
- Male DB-9 or terminal block connector for easy wiring
- Cost-effective Modbus gateway



Introduction

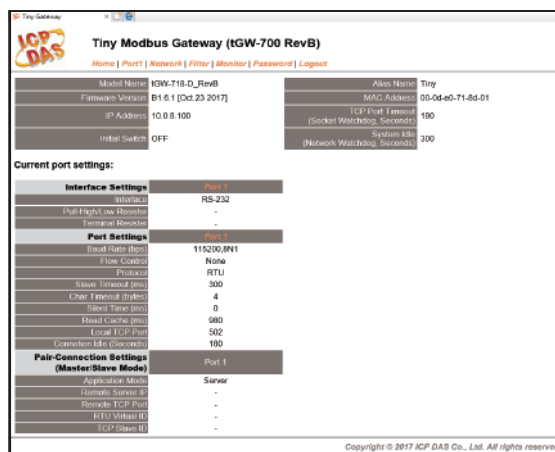
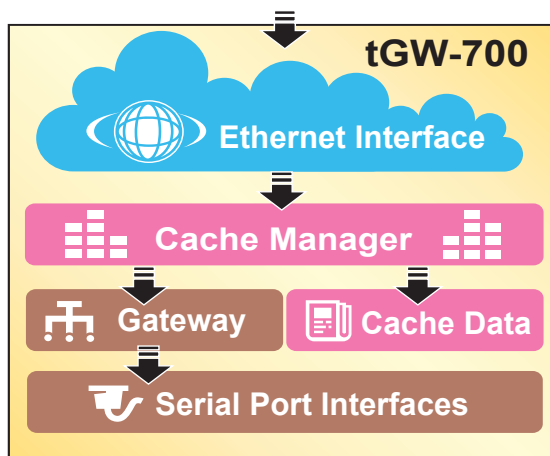
Modbus has become a standard industrial communication protocol, and is now the most commonly available means of connecting industrial electronic devices. Modbus allows for communication between many devices connected to the same RS-485 network, for example, a system that measures temperature and humidity and communicates the results to a computer. Modbus is often used to connect a supervisory computer with a remote terminal unit (RTU) in supervisory control and data acquisition (SCADA) systems.



The tGW-700 module is a Modbus gateway that enables a Modbus TCP/UDP host to communicate with serial Modbus RTU/ASCII devices through an Ethernet network, and eliminates the cable length limitation of legacy serial communication devices. The module can be used to create a pair-connection application (as well as serial-bridge or serial-tunnel application), and can then route data over TCP/IP between two serial Modbus RTU/ASCII devices, which is useful when connecting computers, servers or other serial devices that use Modbus RTU/ASCII protocols and do not themselves have Ethernet capability.

The maximum number of TCP connections for each serial port is up to 32, this allows multiple masters accessing slave devices on the same serial port. The **read-cache function** is used to store previous requests and responses in the memory buffer of the tGW-700 module. When other HMI/SCADA master controllers send the same requests to the same RTU slave device, the cached response is returned immediately. **This feature dramatically reduces the loading on the serial port communication, ensures faster TCP responses, and improves the stability of the entire system.**

The tGW-700 module features a powerful 32-bit MCU to enable efficient handling of network traffic, and also has a built-in web server that provides an intuitive web management interface that allows users to modify the configuration of the module, including the DHCP/Static IP, the gateway/mask settings and the serial port settings.



The CPU watchdog automatically resets the CPU if the built-in firmware is operating abnormally, while the host watchdog automatically resets the CPU if there is no communication between the module and the host (PC or PLC) for a predefined period of time (system timeout). The dual watchdog is an important feature that ensures the module operates continuously, even in harsh environments.

The tGW-700(non-T) offers true IEEE 802.3af-compliant (classification, Class 1) Power over Ethernet (PoE) functionality using a standard category 5 Ethernet cable to receive power from a PoE switch such as the NS-205PSE. If there is no PoE switch on site, the module will also accept power input from a DC adapter. The tGW-700 module is designed for ultra-low power consumption, reducing hidden costs from increasing fuel and electricity prices, especially when you have a large number of modules installed. Reducing the amount of electricity consumed by choosing energy-efficient equipment can have a positive impact on maintaining a green environment.



Based on an amazing tiny form-factor, the tGW-700 achieves maximum space savings that allows it to be easily installed anywhere, even directly embedded into a machine. It also supports automatic RS-485 direction control when sending and receiving data, thereby improving the stability of the RS-485 communication.

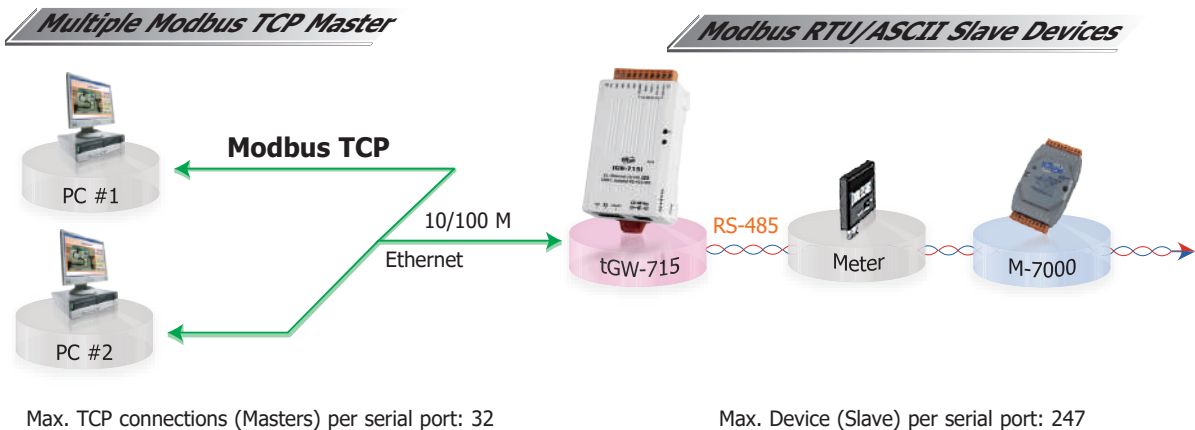
| Comparison Table | Ethernet | Programmable | Virtual COM | Virtual I/O | DHCP | Web Configuration | UDP Search | Modbus Gateway | Multi-client |
|----------------------|---------------|--------------|-------------|-------------|------|-------------------|------------|----------------|--------------|
| tGW-700 Series | 10/100 M, PoE | - | - | - | Yes | Yes | Yes | Yes | Yes |
| tGW-700-T Series | 10/100 M | - | - | - | Yes | Yes | Yes | Yes | Yes |
| PPDS-700-MTCP Series | 10/100 M, PoE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Applications

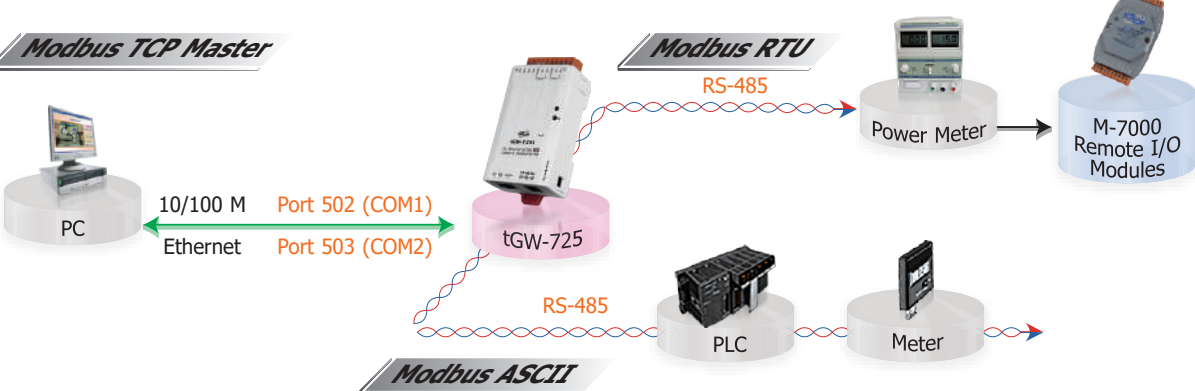
- Factory Automation
- Home Automation
- Building Automation
- Remote Diagnosis and Management



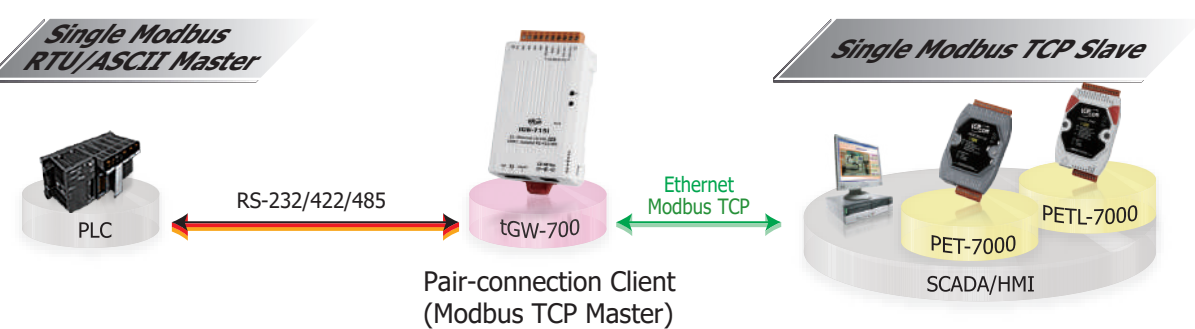
1. Modbus TCP Masters to RTU/ASCII Gateway application



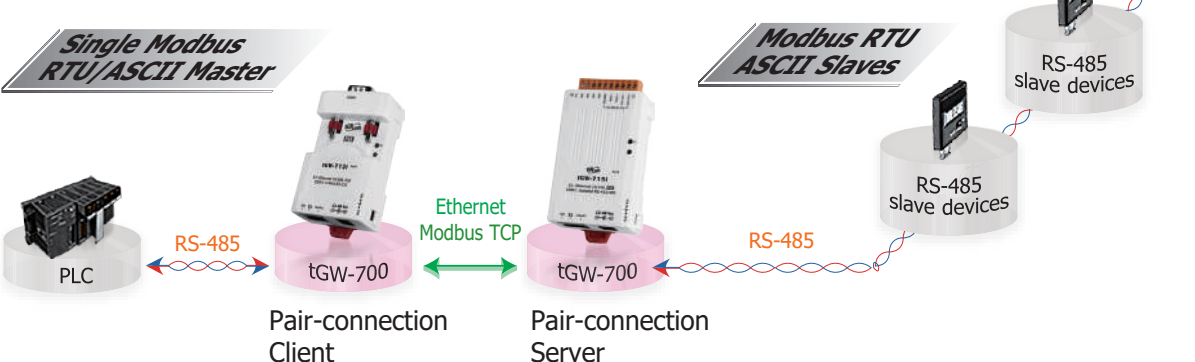
2. Modbus TCP to RTU/ASCII Gateway application (dual-port)



3. Modbus RTU/ASCII to TCP Gateway application (like pair-connection)



4. Virtual RS-485 bus application through pair-connection

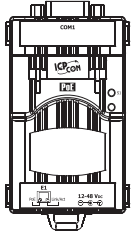
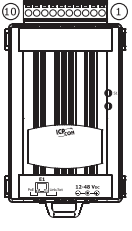

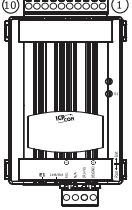


Specifications

| Models | tGW-712 tGW-712i | tGW-722 tGW-722i | tGW-732 tGW732i | tGW-715 tGW-715i tGW-715-T tGW-715i-T | tGW-725 tGW-725i | tGW-735 tGW-735i | tGW-718 tGW-718i tGW-718-T tGW-718i-T | tGW-718i-D | tGW-724 tGW-724i | tGW-734 tGW-734i |
|---|--|-----------------------|--------------------|--|---------------------|---------------------|--|--------------------------|--------------------------|---------------------|
| System | | | | | | | | | | |
| CPU | 32-bit MCU | | | | | | | | | |
| Communication Interface | | | | | | | | | | |
| Ethernet | 10/100 Base-TX, 8-pin RJ-45 x 1, (Auto-negotiating, Auto-MDI/MDIX, LED indicator) | | | | | | | | | |
| PoE | 700 Series | IEEE 802.3af, Class 1 | | | | | | | | |
| | 700-T Series | - | | | | | | | | |
| COM Port | 1 x RS-232 | 2 x RS-232 | 3 x RS-232 | 1 x RS-422/ RS-485 | 2 x RS-485 | 3 x RS-485 | 1 x RS-232 or RS-422/485 | 1 x RS-485 1 x RS-232 | 1 x RS-485 2 x RS-232 | |
| Self-Tuner | - | | | Yes, automatic RS-485 direction control | | | | | | |
| Power Isolation | 1000 Vdc for tGW-722i/ 732i/ 718i-D | | | | | | | | | |
| Signal Isolation | 3000 Vdc for tGW-712i/ 715i/ 725i/ 735i/ 718i/ 724i/ 734i/ 715i-T/ 718i-T | | | | | | | | | |
| ESD Protection | +/-4 kV | | | | | | | | | |
| COM Port Capability (16C550 or compatible UART) | | | | | | | | | | |
| Baud Rate | 115200 bps Max. | | | | | | | | | |
| Data Bit | 5, 6, 7, 8 | | | | | | | | | |
| Parity | None, Odd, Even, Mark, Space | | | | | | | | | |
| Stop Bit | 1, 2 | | | | | | | | | |
| Power | | | | | | | | | | |
| Power Input | IEEE 802.3af, Class 1 for PoE; +12 ~ 48 Vdc for DC Jack | | | | | | | | | |
| Power Consumption | 0.07 A @ 24 Vdc | | | | | | | | | |
| Mechanical | | | | | | | | | | |
| Connector | Male DB-9 x 1 for tGW-712(i)/ 718i-D 10-pin Removable Terminal Block x 1 for tGW-722(i)/ 732(i)/ 715(i)/ 725(i)/ 735(i)/ 718(i)/ 724(i)/ 734(i)/ 715(i)-T/ 718(i)-T | | | | | | | | | |
| Dimensions (W x H x D) | 52 mm x 95 mm x 27 mm (tGW-712: 52 mm x 90 mm x 27 mm) | | | | | | | | | |
| Installation | DIN-Rail mounting | | | | | | | | | |
| Case | Plastic | | | | | | | | | |
| Environment | | | | | | | | | | |
| Operating Temperature | -25 °C ~ +75 °C | | | | | | | | | |
| Storage Temperature | -30 °C ~ +80 °C | | | | | | | | | |
| Humidity | 10 ~ 90% RH, non-condensing | | | | | | | | | |

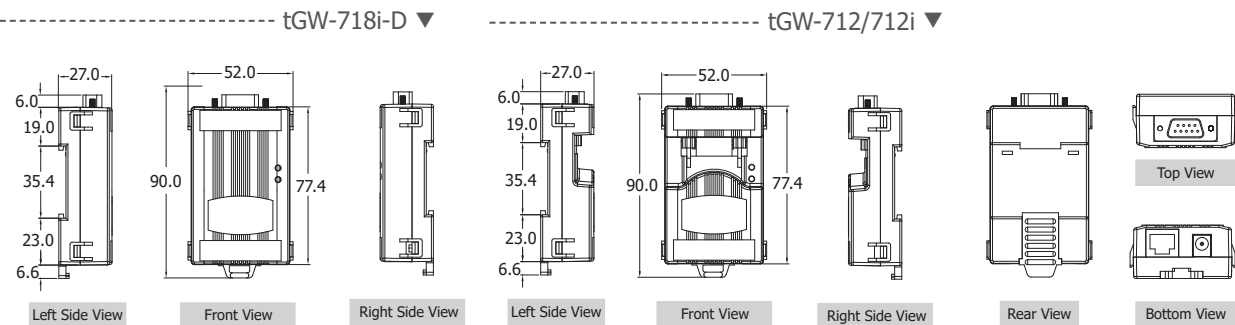
Note: COM1 = TCP Port 502, COM2 = TCP Port 503, COM3 = TCP Port 504

Apparances

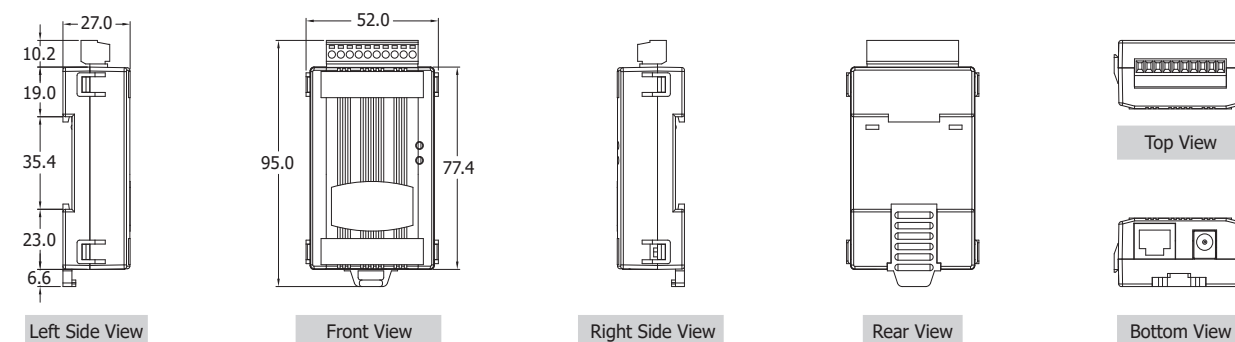
| | | | | | | | | | | | | |
|---|------------------|--|--------|---|----------------------------|------|---|------|---|------|---|--------|
|  | tGW-712(i) | | |  | tGW-722(i) | | tGW-732(i) | | tGW-735(i) | | tGW-718(i) tGW-718(i)-T | |
| | COM1 (Male DB-9) | 09 N/A 08 CTS1 07 RTS1 06 N/A 05 GND 04 N/A 03 TxD1 02 RxD1 01 N/A | | | | COM2 | 10 F.G. 09 GND 08 RTS2 07 RxD2 06 TxD2 05 GND 04 CTS1 03 RTS1 02 RxD1 01 TxD1 | COM3 | 10 F.G. 09 GND 08 RxD3 07 TxD3 06 GND 05 RxD2 04 TxD2 03 GND 02 RxD1 01 TxD1 | COM3 | 10 F.G. 09 GND 08 D3- 07 D3+ 06 GND 05 D2- 04 D2+ 03 GND 02 D1- 01 D1+ | RS-232 |
|  | tGW-718i-D | | |  | tGW-715(i) tGW-715(i)-T | | tGW-725(i) | | tGW-724(i) | | tGW-734(i) | |
| | Terminal No. | RS-232 | RS-422 | | RS-485 | COM1 | 10 F.G. 09 N/A 08 N/A 07 N/A 06 N/A 05 GND 04 RxD1- 03 RxD1+ 02 TxD1-/D1- 01 TxD1+/D1+ | COM2 | 10 F.G. 09 N/A 08 N/A 07 N/A 06 GND 05 D2- 04 D2+ 03 GND 02 D1- 01 D1+ | COM2 | 10 F.G. 09 N/A 08 CTS2 07 RTS2 06 GND 05 RxD2 04 TxD2 03 GND 02 D1- 01 D1+ | COM3 |

■ Dimensions (Units: mm)

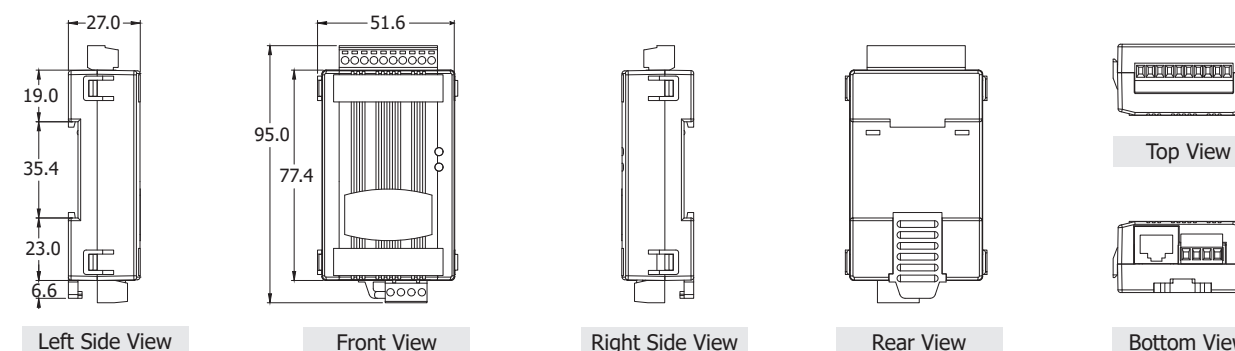
tGW-712/712i/718i-D



tGW-715(i)/718(i)/722(i)/725(i)/732(i)/735(i)/724(i)/734(i)



tGW-715(i)-T/718(i)-T



■ Ordering Information

| Non-Isolated | Isolated | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and DC jack: Includes DC connector to 2-wire power cable |
|--------------|------------------------------|--|
| tGW-712 CR | tGW-712i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1-port RS-232 (RoHS) |
| tGW-722 CR | tGW-722i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2-port RS-232 (RoHS) |
| tGW-732 CR | tGW-732i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3-port RS-232(RoHS) |
| tGW-715 CR | tGW-715i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1-port RS-422/485 (RoHS) |
| tGW-725 CR | tGW-725i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 2-port RS-485 (RoHS) |
| tGW-735 CR | tGW-735i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 3-port RS-485 (RoHS) |
| tGW-718 CR | tGW-718i CR tGW-718i-D CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and 1-port RS-232/422/485 (RoHS) (10-pin Terminal Block Conntecor for tGW-718/718i, Male DB-9 Conntecor for tGW-718i-D) |
| tGW-724 CR | tGW-724i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 1-port RS-232 and 1-port RS-485 (RoHS) |
| tGW-734 CR | tGW-734i CR | Tiny Modbus/TCP to RTU/ASCII Gateway with PoE, 2-port RS-232 and 1-port RS-485 (RoHS) |
| Non-Isolated | Isolated | Tiny Modbus/TCP to RTU/ASCII Gateway with DC Terminal Block |
| tGW-715-T CR | tGW-715i-T CR | Tiny Modbus/TCP to RTU/ASCII Gateway with 1-port RS-422/485 (RoHS) |
| tGW-718-T CR | tGW-718i-T CR | Tiny Modbus/TCP to RTU/ASCII Gateway with 1-port RS-232/422/485 (RoHS) |

Accessories

CA-002

DC jack to 2-wire Power Cable, 30cm (RoHS)



CA-0915

DB9 Male to DB9 Female Cable [RS-232: Pin1-Pin9], 1.5M (RoHS)



CA-0910F

DB9 Female to DB9 Female Cable [RS-232: Pin1-Pin9], 1M (RoHS)



CA-0910N

DB9 Female to DB9 Female crossover Cable [RS-232: Pin2, Pin3 and Pin5], 1 M (RoHS)



CA-PC09F

DB9 connector Female with plastic cover (Solder Type) (RoHS)



UP0061D-12PA58G CR

Wall mount power supply; Input range 90-240VAC; Output 12VDC/0.5 A, 6 W; two pins USA plug (RoHS)



NS-205PSE CR

Unmanaged 5-port 10/100 Mbps PoE (PSE) Ethernet Switch (RoHS)



NS-205PSE-24V CR

Unmanaged 5-port 10/100 Mbps PoE (PSE) Ethernet Switch; 24 VDC Input (RoHS)

