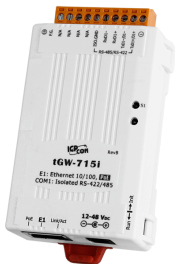




tGW-712



tGW-700 Series



tGW-700-T Series

Tiny Modbus/TCP to RTU/ASCII Gateway

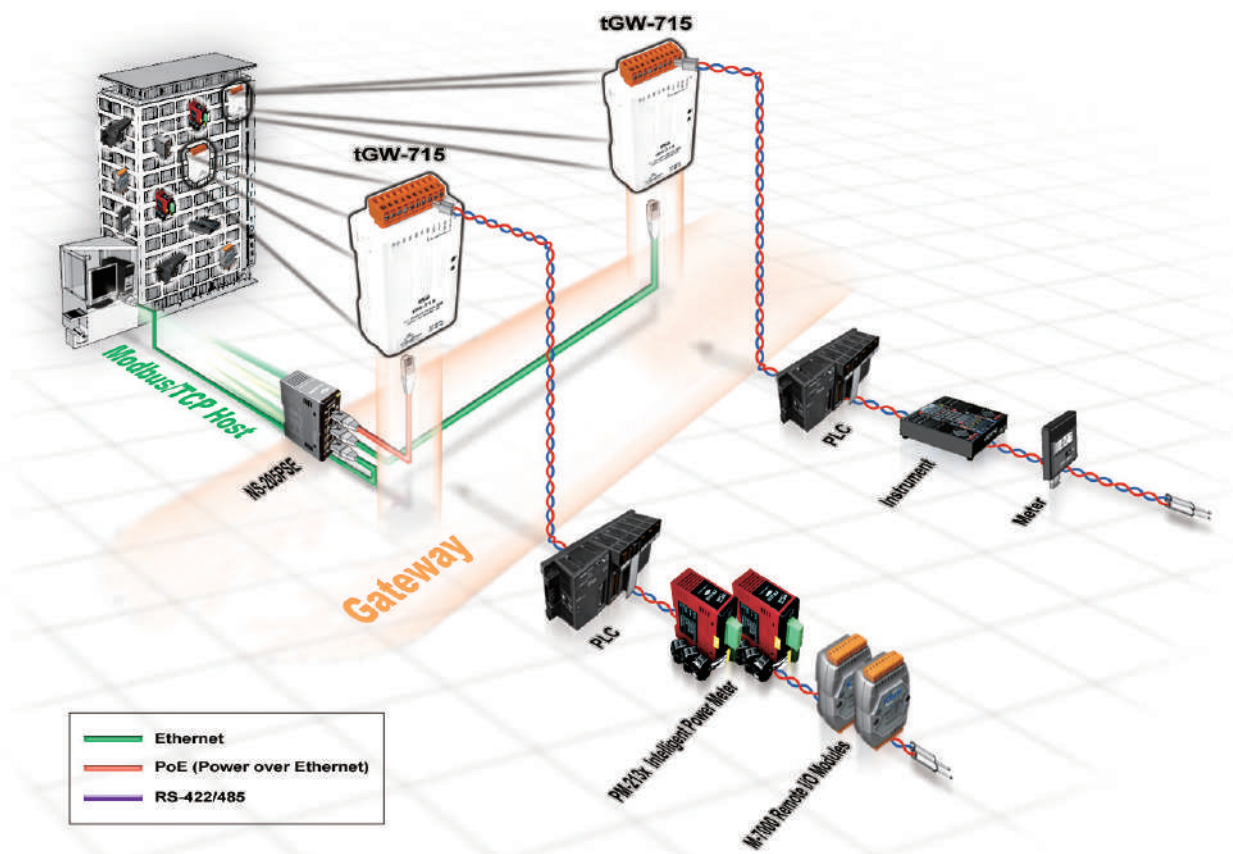
Features

- 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
- Easy firmware update via the Ethernet (BOOTP, TFTP)
- Tiny Web server for serial and network configuration (HTTP)
- Contains a 32-bit MCU that efficiently handles network traffic
- 10/100 Base-TX Ethernet, RJ-45 x 1 (Auto-negotiating, auto MDI/MDIX, LED Indicators)
- Includes redundant power inputs: PoE (IEEE 802.3af, Class 1) and DC jack
- Allows automatic RS-485 direction control
- 3000 VDC Isolation and +/-4 kV ESD protection for i versions
- Male DB-9 or terminal block connector for easy wiring
- Tiny form-factor and low power consumption
- RoHS compliant & no Halogen
- Cost-effective Modbus gateway



Introduction

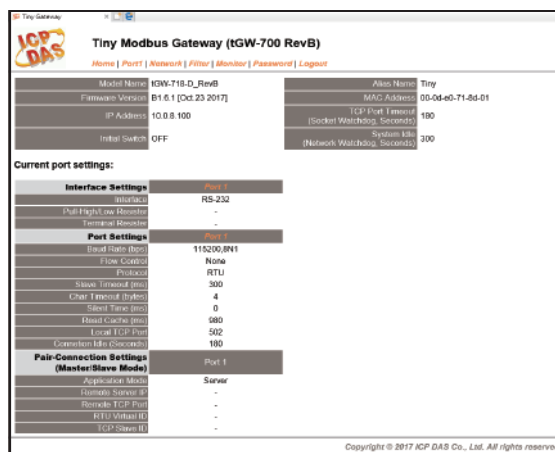
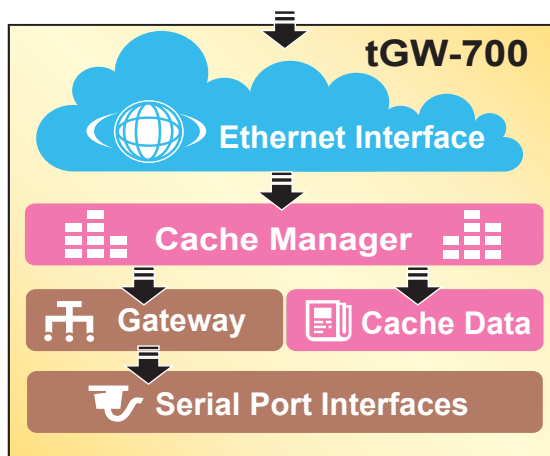
Modbus has become a standard industrial communication protocol, and is now the most commonly available means of connecting industrial electronic devices. Modbus allows for communication between many devices connected to the same RS-485 network, for example, a system that measures temperature and humidity 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

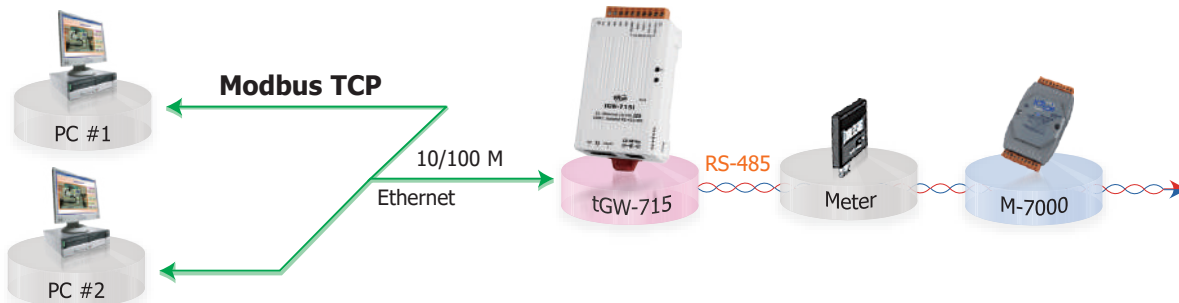
- Factory Automation
- Home Automation
- Building Automation
- Remote Diagnosis and Management



1. Modbus TCP Masters to RTU/ASCII Gateway application

Multiple Modbus TCP Master

Modbus RTU/ASCII Slave Devices



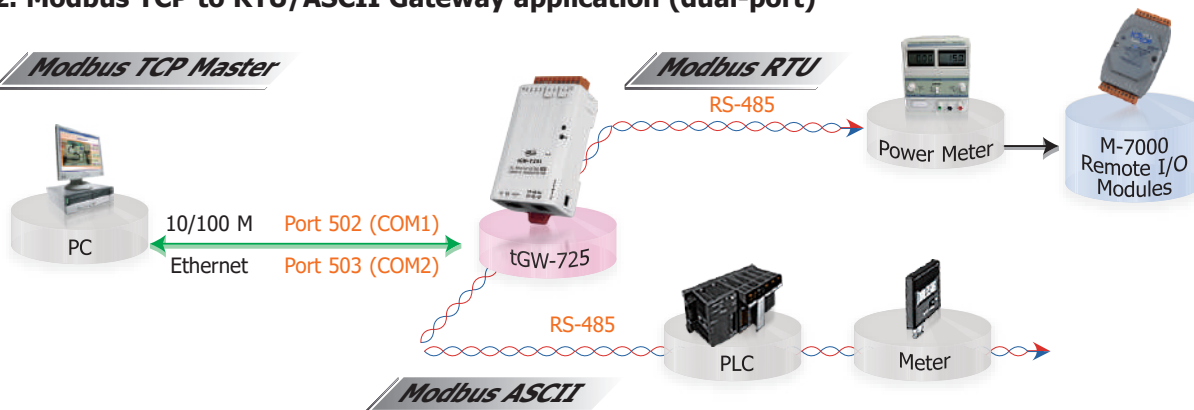
Max. TCP connections (Masters) per serial port: 32

Max. Device (Slave) per serial port: 247

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

Modbus TCP Master

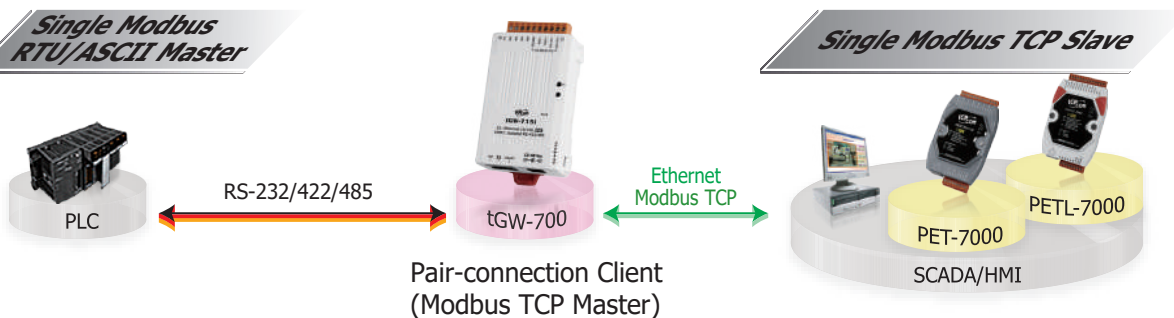
Modbus RTU



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

Single Modbus RTU/ASCII Master

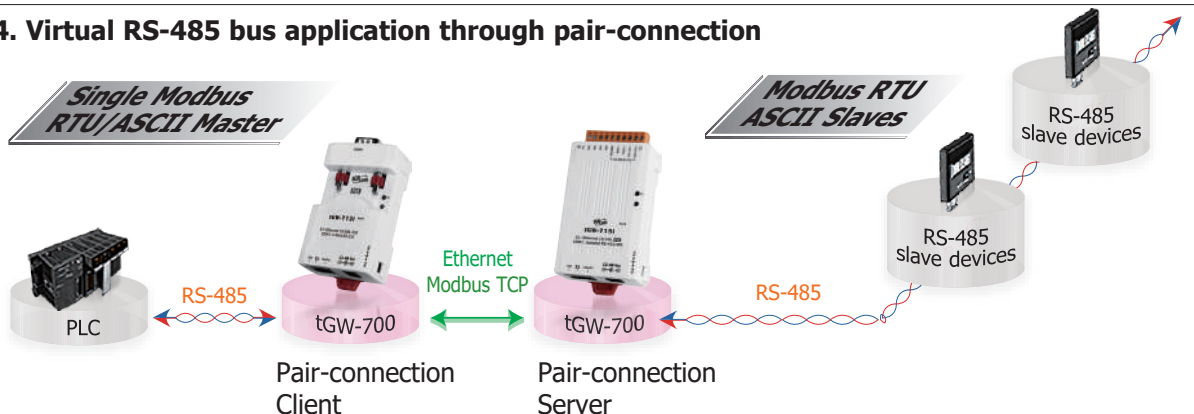
Single Modbus TCP Slave



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

Single Modbus RTU/ASCII Master

Modbus RTU ASCII Slaves

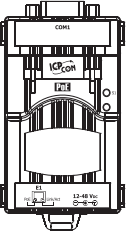
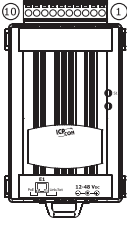
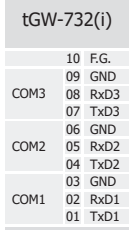
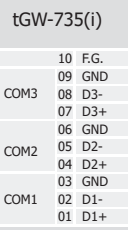
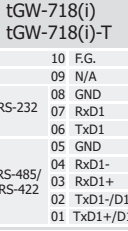


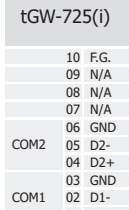
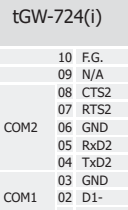
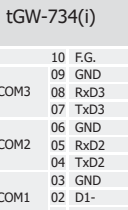


Specifications

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 10001, COM2 = TCP Port 10002, COM3 = TCP Port 10003

Apparances

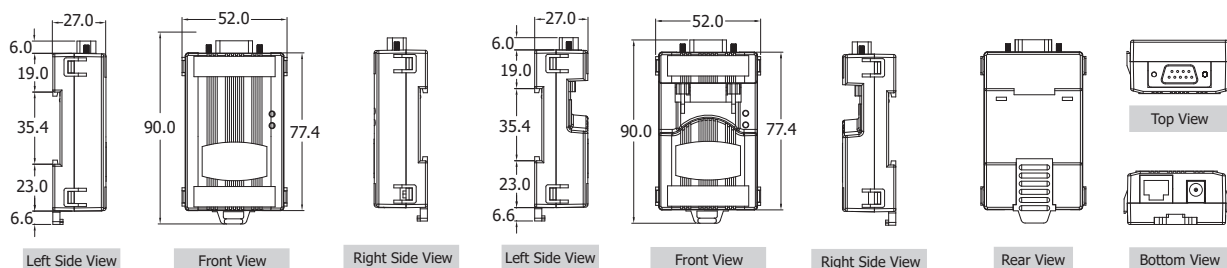
	tGW-712(i) 09 N/A 08 CTS1 07 RTS1 COM1 (Male DB-9) 06 N/A 05 GND 04 N/A 03 TxD1 02 RxD1 01 N/A		tGW-722(i) 10 F.G. 09 CTS2 COM2 08 RTS2 07 RxD2 06 TxD2 05 GND 04 CTS1 COM1 03 RTS1 02 RxD1 01 TxD1		tGW-732(i) 10 F.G. COM3 08 RxD3 07 TxD3 06 GND COM2 05 RxD2 04 TxD2 03 GND COM1 02 RxD1 01 TxD1		tGW-735(i)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

■ Dimensions (Units: mm)

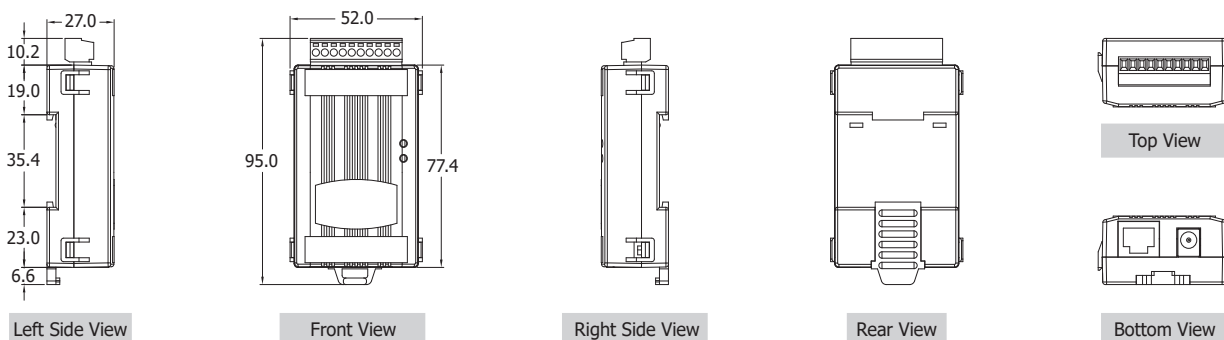
tGW-712/712i/718i-D

tGW-718i-D ▼

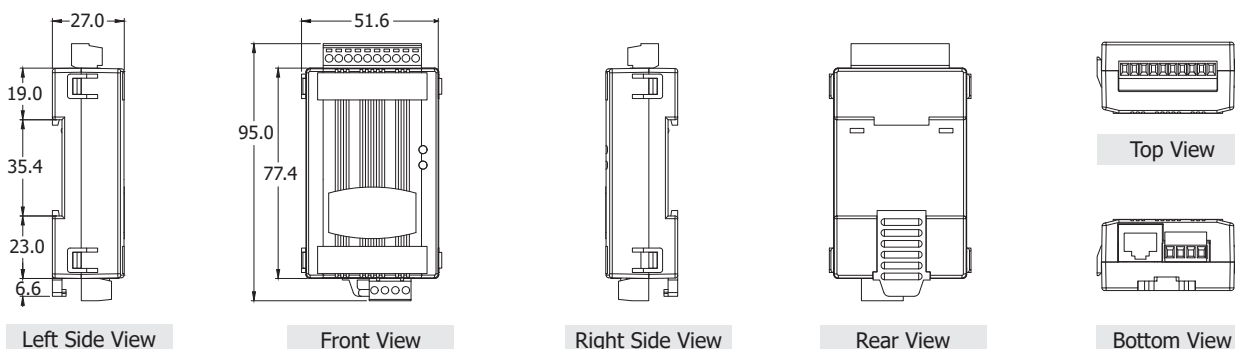
tGW-712/712i ▼



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 connector to 2-wire power cable, 0.3 M



CA-0915

Male DB-9 to Female DB-9 Cable, 1.5 m



CA-0910F

Female DB-9 to Female DB-9 Cable, 1.0 m



CA-0910N

DB-9 Female-Female 3-wire Null Modem Cable, 1M



CA-PC09F

DB-9 Female Connector with Plastic Cover



UP0061D-12PA58G CR

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



NS-205PSE CR

Unmanaged Ethernet Switch with 4 PoE Ports and 1 RJ-45 Uplink (RoHS)



NS-205PSE-24V CR

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

