tGW-712

tGW-700 Series

tGW-700-T Series

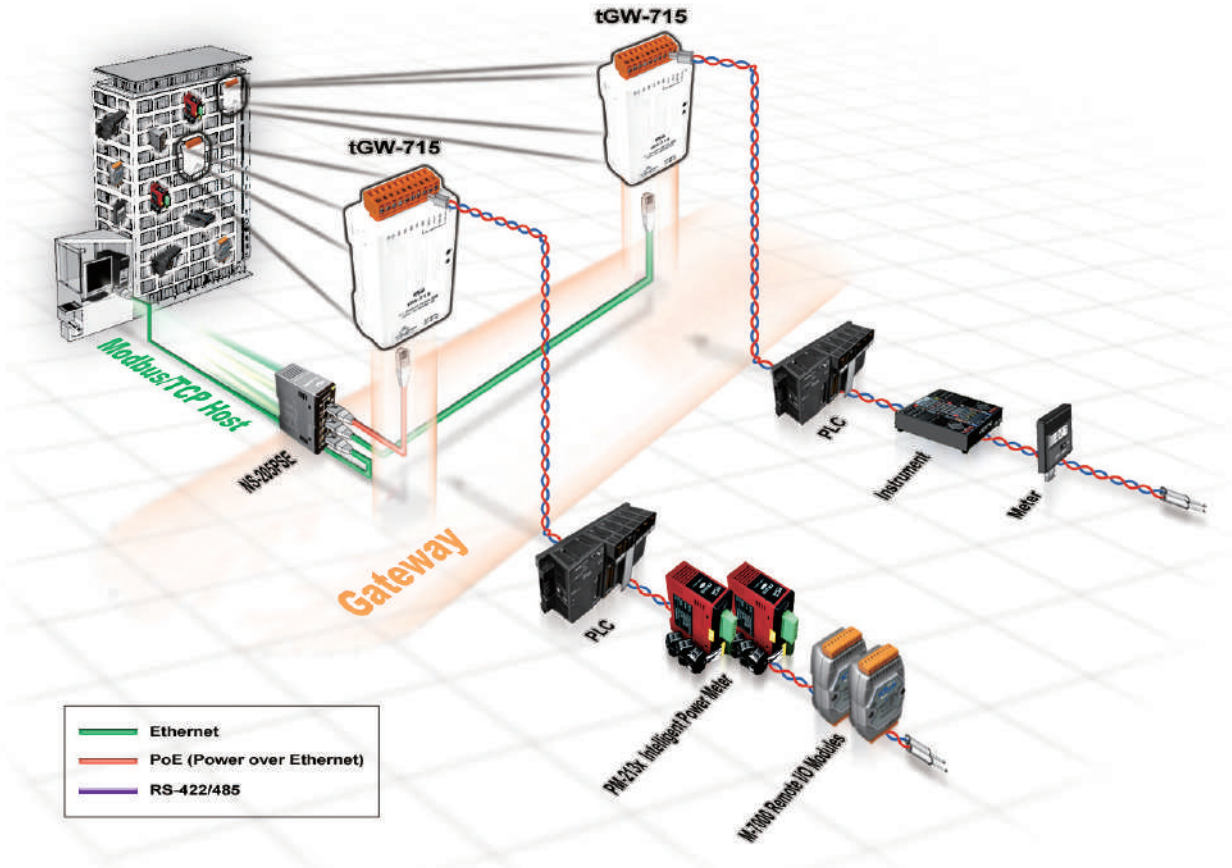
Tiny Modbus/TCP to RTU/ASCII Gateway

Features

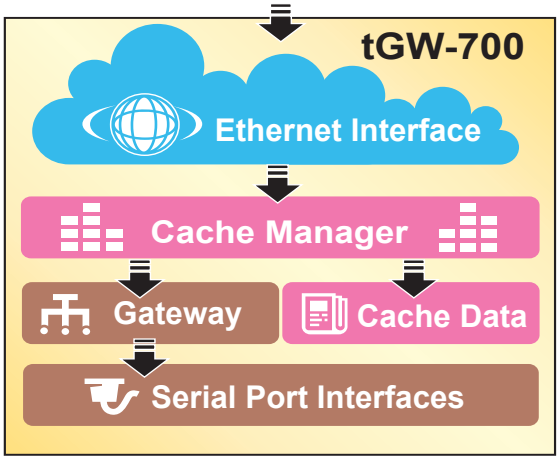
- Supports Modbus TCP/UDP master and slave
- Supports Modbus RTU/ASCII master and slave
- Max. TCP connections (masters) per serial port: 32
- Read-cache ensures faster Modbus TCP/UDP response
- Supports UDP responder for device discovery (UDP Search)
- Static IP or DHCP network configuration
- Tiny 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

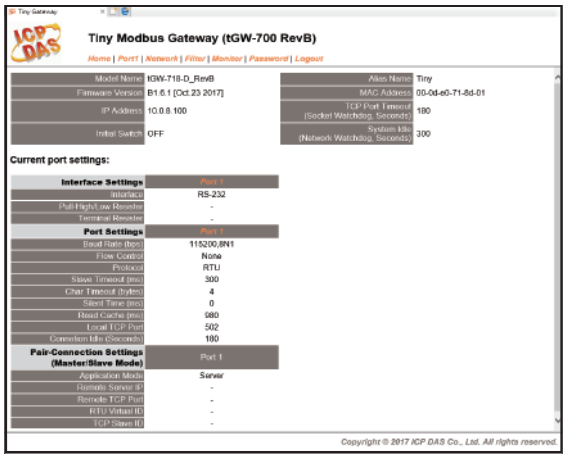
Modbus has become a standard industrial communication protocol, and is now the most commonly available means of connecting industrial electronic devices. Modbus allows for communication between many devices connected to the same RS-485 network, for example, a system that measures temperature and humidity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

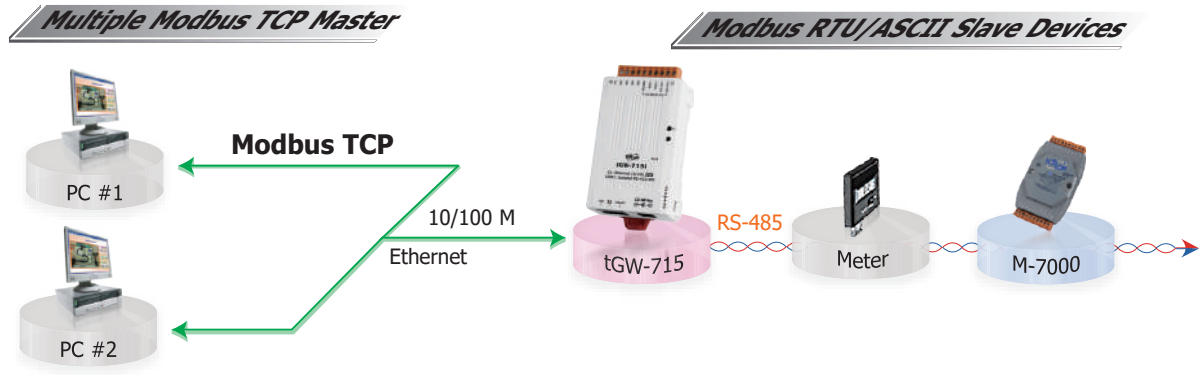
Based on an amazing tiny form-factor, the tGW-700 achieves maximum space savings that allows it to be easily installed anywhere, even directly embedded into a machine. It also supports automatic RS-485 direction control when sending and receiving data, thereby improving the stability of the RS-485 communication.

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

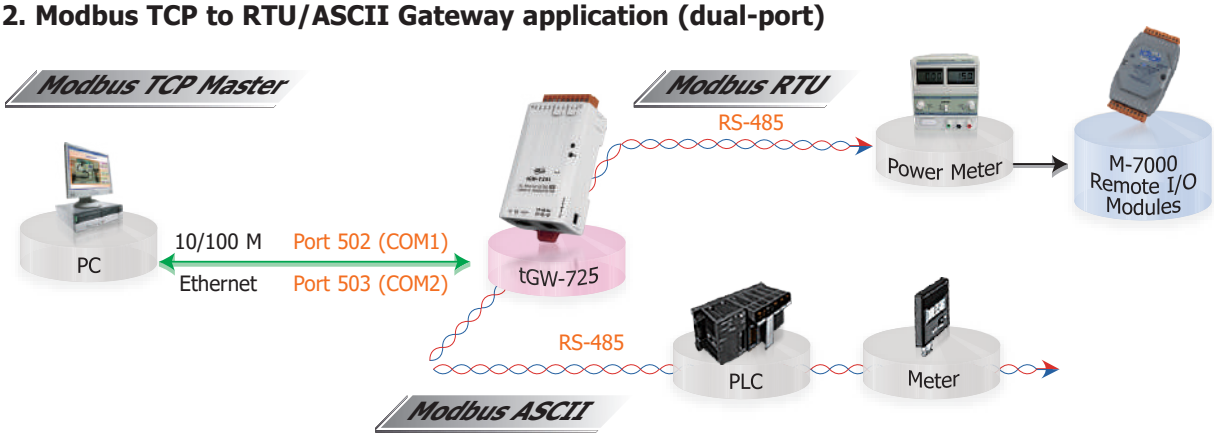
1. Modbus TCP Masters to RTU/ASCII Gateway application



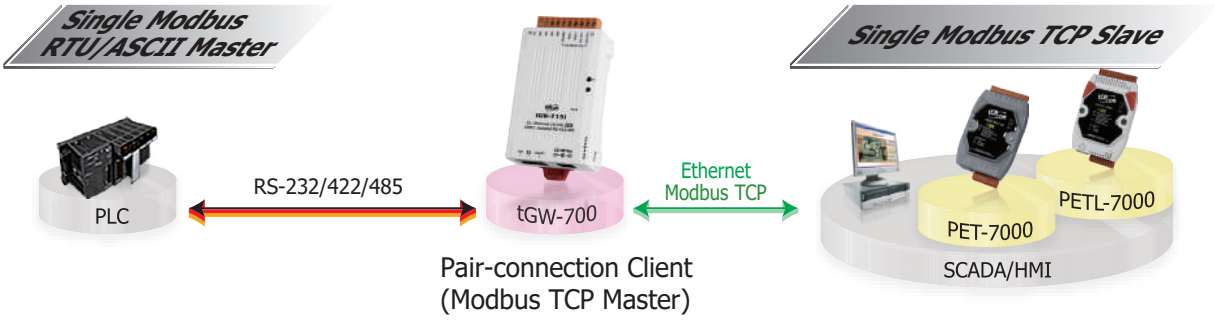
Max. TCP connections (Masters) per serial port: 32

Max. Device (Slave) per serial port: 247

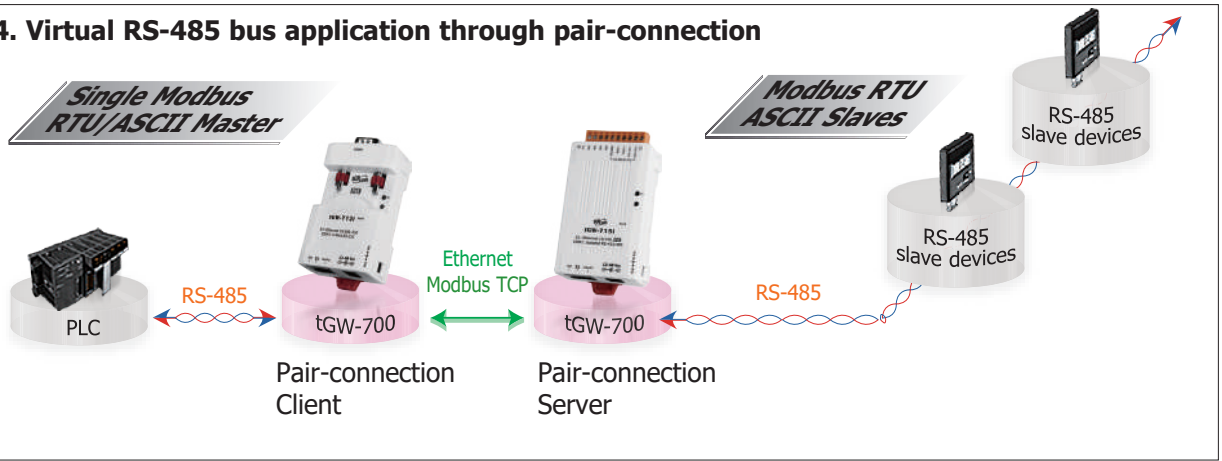
2. Modbus TCP to RTU/ASCII Gateway application (dual-port)



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



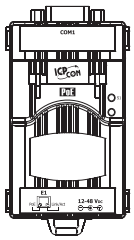
4. Virtual RS-485 bus application through pair-connection



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)

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

tGW-718i-D

Terminal No.		RS-232	RS-422	RS-485
COM1 (Male DB-9)	09	N/A	N/A	N/A
	08	CTS	N/A	N/A
	07	RTS	N/A	N/A
	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-722(i)

COM2	10	F.G.
	09	CTS2
	08	RTS2
	07	RxD2
	06	TxD2
	05	GND
COM1	04	CTS1
	03	RTS1
	02	RxD1
	01	TxD1

tGW-732(i)

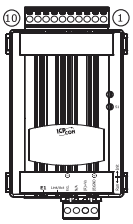
COM3	10	F.G.
	09	GND
	08	RxD3
	07	TxD3
	06	GND
COM2	05	RxD2
	04	TxD2
	03	GND
COM1	02	RxD1
	01	TxD1

tGW-735(i)

COM3	10	F.G.
	09	GND
	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

RS-232	10	F.G.
	09	N/A
	08	GND
	07	RxD1
	06	TxD1
RS-485/ RS-422	05	GND
	04	RxD1-
	03	RxD1+
	02	TxD1-/D1-
	01	TxD1+/D1+



tGW-700-T Series

tGW-715(i)
tGW-715(i)-T

RS-485/ RS-422	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+

tGW-725(i)

COM2	10	F.G.
	09	N/A
	08	N/A
	07	N/A
	06	GND
	05	D2-
	04	D2+
	03	GND
COM1	02	D1-
	01	D1+

tGW-724(i)

COM2	10	F.G.
	09	N/A
	08	CTS2
	07	RTS2
	06	GND
	05	RxD2
	04	TxD2
	03	GND
COM1	02	D1-
	01	D1+

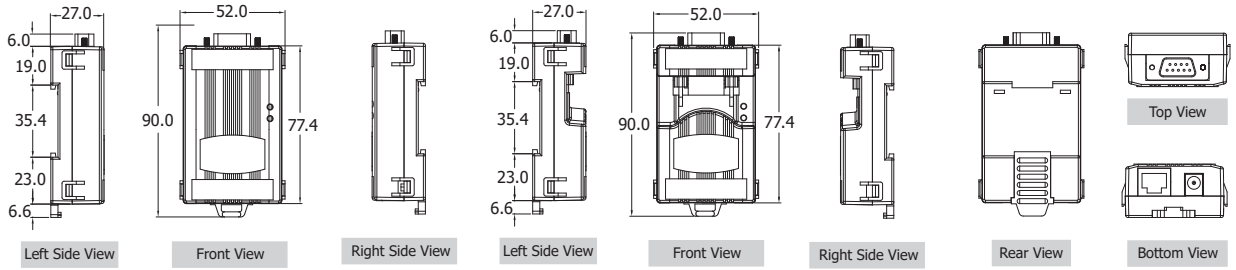
tGW-734(i)

COM3	10	F.G.
	09	GND
	08	RxD3
	07	TxD3
	06	GND
COM2	05	RxD2
	04	TxD2
	03	GND
COM1	02	D1-
	01	D1+

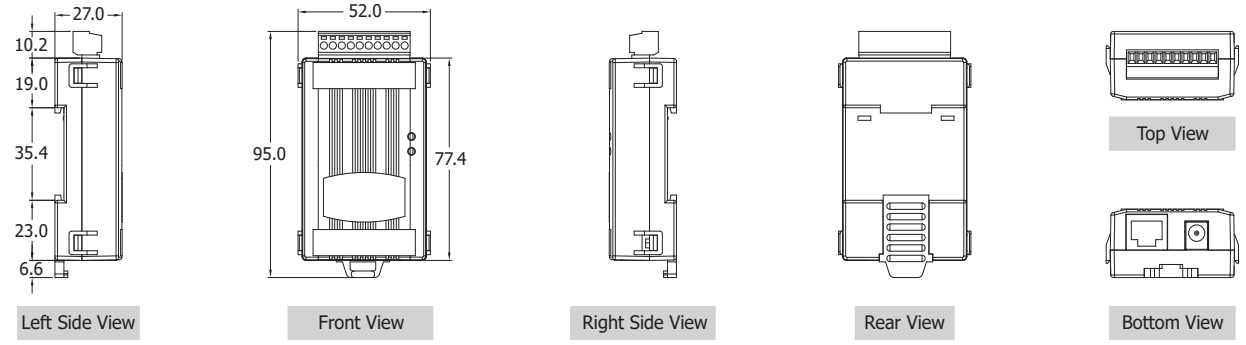
Dimensions (Units: mm)

tGW-712/712i/718i-D

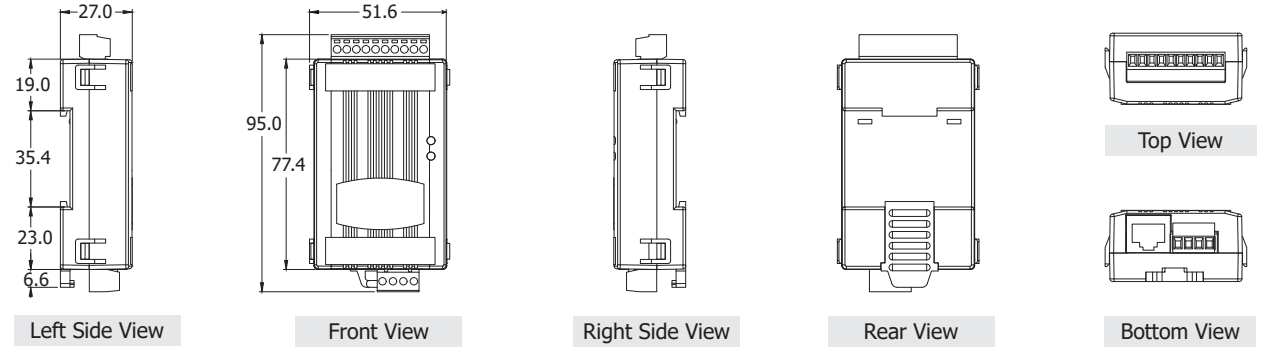
tGW-718i-D ▼ tGW-712/712i ▼



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 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)

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