Making Data Acquisition Easy

Industrial Modbus Gateway

Modbus is 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.

There are different version of the Modbus protocol for serial and Ethernet communication. Modbus RTU and ASCII are used in serial communication that makes use of ASCII characters for protocol communication. Modbus RTU is the most common implementation available for Modbus. Modbus TCP is used for communication over TCP/IP networks, connecting over port 502.
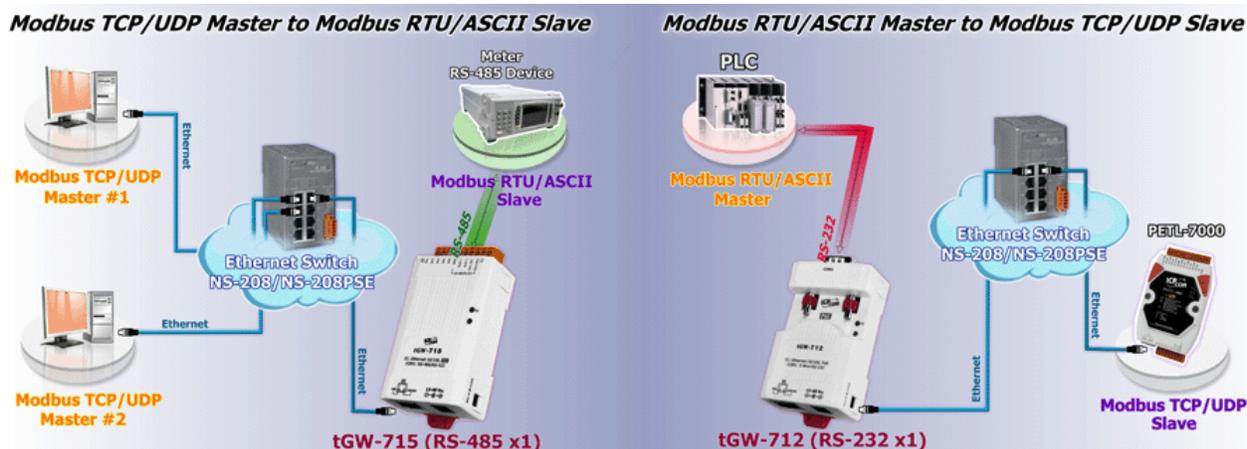
The tGW-700 is a Modbus TCP to RTU/ASCII gateway that enables a Modbus/TCP host to communicate with serial Modbus RTU/ASCII devices through an Ethernet network, and eliminates the cable length limitation of legacy serial communication devices. The module can be used to create a pair-connection application (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 mainframe computers, servers or other serial devices that use Modbus RTU/ASCII protocols and do not themselves have Ethernet capability.

The new 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 RS-485 bus communication, ensures faster TCP responses, and improves the stability of the entire system.

DHCP minimizes configuration errors caused by manual IP address configuration, such as address conflicts caused by the assignment of an IP address to more than one computer or device at the same time. The tGW-700 module supports the DHCP client function, which allows it to easily obtain the necessary TCP/IP configuration information from a DHCP server. The module also contains a UDP responder that transmits its IP address information in response to a UDP search from the eSearch utility, making local management more efficient.

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The tGW-700 module also 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 module contains a dual watchdog, including a CPU watchdog (for hardware functions) and a host watchdog (for software functions). 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. In addition, the tGW-700 series (for i version) also adds 3000 VDC isolation and +/-4 kV ESD protection component that diverts the potentially damaging charge away from sensitive circuit to protects the module and equipment from the sudden and momentary electric current.

The tGW-700 module 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.

The module is equipped with a male DB-9 or a removable terminal block connector to allow easy wiring. 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.
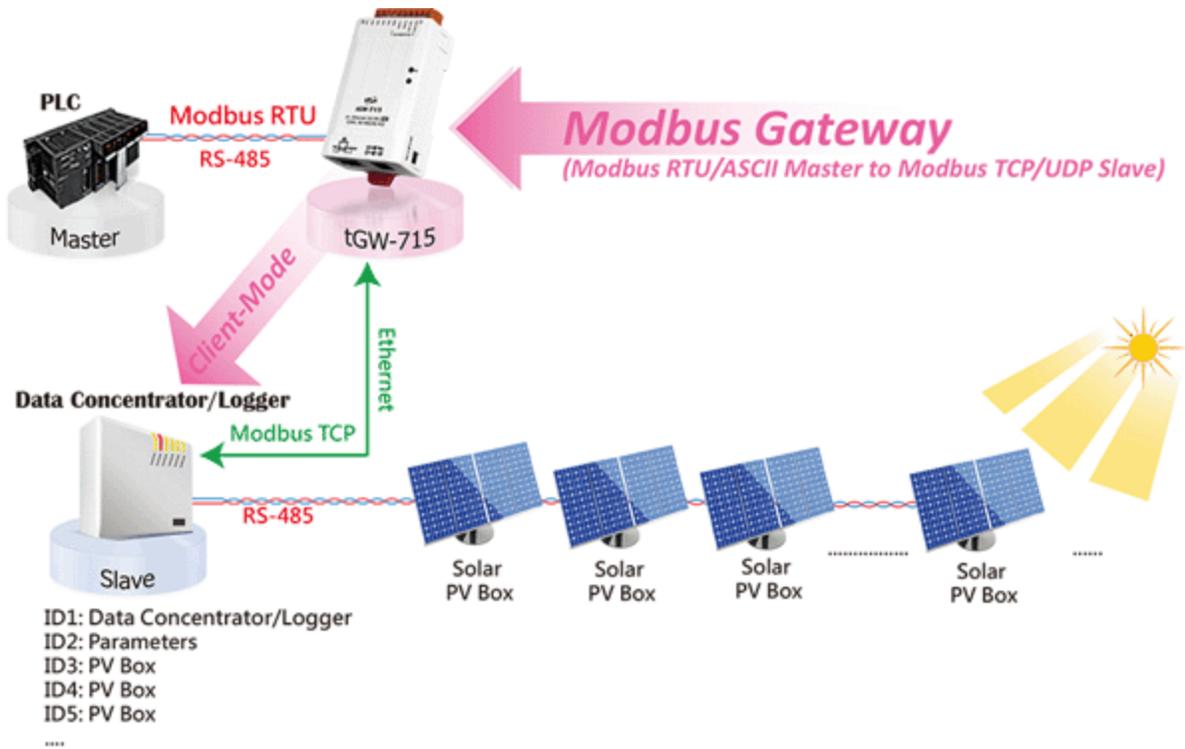
tGW-700 series offers different combination of number of ports to select, including RS-232, RS-422, and RS-485 for your applications.

Selection Guide

tGW-700 Series (Tiny Modbus/TCP to RTU/ASCII Gateway with PoE and DC jack) : Includes one CA-002 cable.

Model (Non-Isolated)	Model (Isolated)	RS-232	RS-422/485	RS-485	COM1	COM2	COM3
tGW-712 CR	tGW-712i CR	1	-	-	3-wire RS-232	-	-
tGW-722 CR	tGW-722i CR	2	-	-	3-wire RS-232	3-wire RS-232	-
tGW-732 CR	tGW-732i CR	3	-	-	3-wire RS-232	3-wire RS-232	3-wire RS-232
tGW-715 CR	tGW-715i CR	-	1	-	2-wire RS-485 4-wire RS-422	-	-
tGW-725 CR	tGW-725i CR	-	-	2	2-wire RS-485	2-wire RS-485	-
tGW-735 CR	tGW-735i CR	-	-	3	2-wire RS-485	2-wire RS-485	2-wire RS-485
tGW-718 CR	tGW-718i CR	1		-	3-wire RS-232 2-wire RS-485 4-wire RS-422	-	-
tGW-724 CR	tGW-724i CR	1	-	1	2-wire RS-485	3-wire RS-232	-
tGW-734 CR	tGW-734i CR	2	-	1	2-wire RS-485	3-wire RS-232	3-wire RS-232

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If you have other industrial communication requirements or have questions, we can certainly help you to choose the best solution. Please call our technical support team at (310) 517-9888 X102