ICP DAS tGW-725

ICP DAS tGW-725 Modbus TCP to RTU/ASCII Gateway User Manual

Model: tGW-725

Introduction Features Setup Operation Applications Specifications Troubleshooting Maintenance Warranty & Support

1. Introduction

The ICP DAS tGW-725 is a compact Modbus TCP to Modbus RTU/ASCII Gateway designed for industrial applications. It facilitates seamless communication between Modbus TCP/UDP masters and Modbus RTU/ASCII slaves, supporting both master and slave modes for Modbus TCP and RTU/ASCII protocols. This device features Power over Ethernet (PoE) for flexible power options and includes two RS-485 ports for connecting to serial devices. Its robust design and efficient 32-bit MCU ensure reliable network traffic handling.

2. Key Features

- Cost-effective Modbus/TCP to RTU/ASCII Gateway.
- Supports Modbus/TCP master and slave modes.
- Supports Modbus RTU/ASCII master and slave modes.
- Equipped with a 32-bit MCU for efficient network traffic management.
- Features 10/100 Base-TX Ethernet, RJ-45 x 1 (Auto-negotiating, auto MDI/MDIX, with LED Indicators).
- Includes redundant power inputs: PoE (IEEE 802.3af, Class 1) and DC jack (12~48 VDC).
- Allows automatic RS-485 direction control.
- Supports TCP, UDP, HTTP, DHCP, BOOTP, and TFTP protocols.
- Supports UDP responder for device discovery.
- Enables easy firmware updates via Ethernet.
- Contains a compact Web server for configuration.
- Provides Male DB-9 or terminal block connectors for simplified wiring.

3. Setup and Installation

3.1 Device Overview

Figure 3.1: Front view of the tGW-725 gateway, highlighting the Ethernet port (E1), PoE indicator, Link/Act LED, 12-48 VDC power input, and the COM1/COM2 RS-485 terminal block.

Figure 3.2: Angled view of the tGW-725, providing a clearer perspective of the terminal block and Ethernet port.

3.2 Power Connection

The tGW-725 supports two methods for power input:

- **Power over Ethernet (PoE):** Connect the device to a PoE-enabled switch (IEEE 802.3af, Class 1) using a standard Ethernet cable. This method provides both power and data connectivity through a single cable.
- **DC Jack:** Alternatively, connect a 12~48 VDC power adapter to the DC jack located on the device. Ensure the power supply meets the specified voltage range.

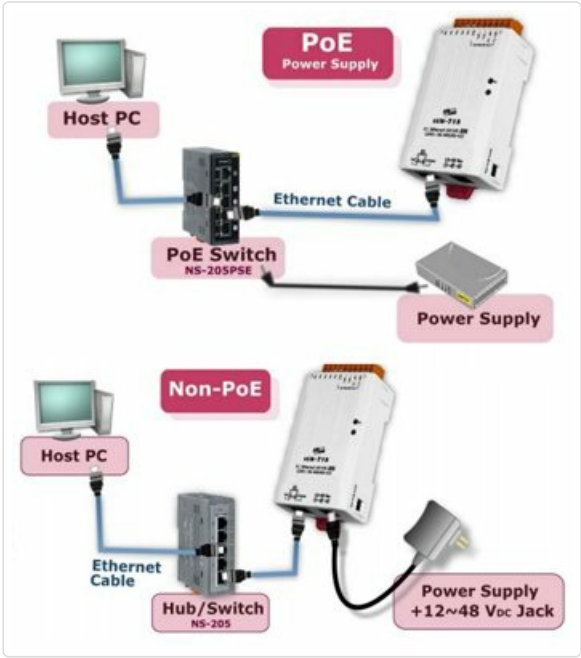

Figure 3.3: Illustration of power connection options. The top diagram shows PoE connection via a PoE switch, while the bottom diagram shows non-PoE connection requiring a separate power supply and a standard Ethernet hub/switch.

3.3 Ethernet Connection

Connect the tGW-725 to your network using a standard Ethernet cable (RJ-45 connector) to the E1 port. The device supports 10/100 Base-TX Ethernet with auto-negotiating and auto MDI/MDIX capabilities. The Link/Act LED will indicate network activity.

3.4 RS-485 Connection

The tGW-725 features two RS-485 ports (COM1 and COM2) for connecting Modbus RTU/ASCII slave devices. Use the provided terminal block connectors for wiring. Ensure correct polarity (D+, D-) and ground connections. The device includes automatic RS-485 direction control, simplifying wiring and configuration.

4. Operation and Configuration

4.1 Modbus Protocol Conversion

The tGW-725 acts as a gateway between Modbus TCP/UDP and Modbus RTU/ASCII protocols. It can operate in various modes:

- **Modbus TCP/UDP Master to Modbus RTU/ASCII Slave:** Allows Modbus TCP/UDP masters (e.g., Host PCs) to communicate with Modbus RTU/ASCII slave devices connected to the RS-485 ports.
- **Modbus RTU/ASCII Master to Modbus TCP/UDP Slave:** Enables Modbus RTU/ASCII masters (e.g., PLCs) to communicate with Modbus TCP/UDP slave devices over the Ethernet network.

Figure 4.1: Modbus communication scenarios. The left side shows Modbus TCP/UDP masters communicating with an RS-485 device via the tGW-715 (similar to tGW-725). The right side shows a Modbus RTU/ASCII master communicating with a Modbus TCP/UDP slave via the tGW-712 (similar to tGW-725).

4.2 Web-Based Configuration

The tGW-725 includes a built-in web server for easy configuration. Access the device's IP address through a web browser to configure network settings, Modbus parameters, and other operational modes. Refer to the detailed product manual (available on the manufacturer's website) for specific web interface instructions.

4.3 Firmware Update

Firmware updates can be performed easily via the Ethernet connection. This ensures your device can benefit from the latest features and security enhancements. Consult the official documentation for the firmware update procedure.

5. Applications

The ICP DAS tGW-725 gateway is suitable for a wide range of industrial and automation applications where Modbus protocol conversion is required.

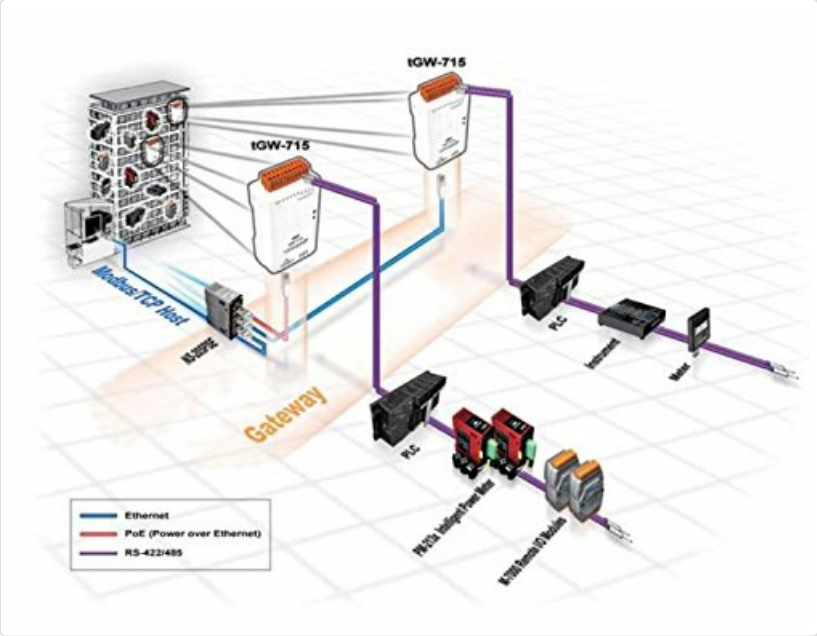

Figure 5.1: Example application showing the tGW-725 (represented by tGW-715 in diagram) acting as a gateway, connecting a Modbus TCP host to various RS-485 devices including PLCs, instruments, and meters.

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

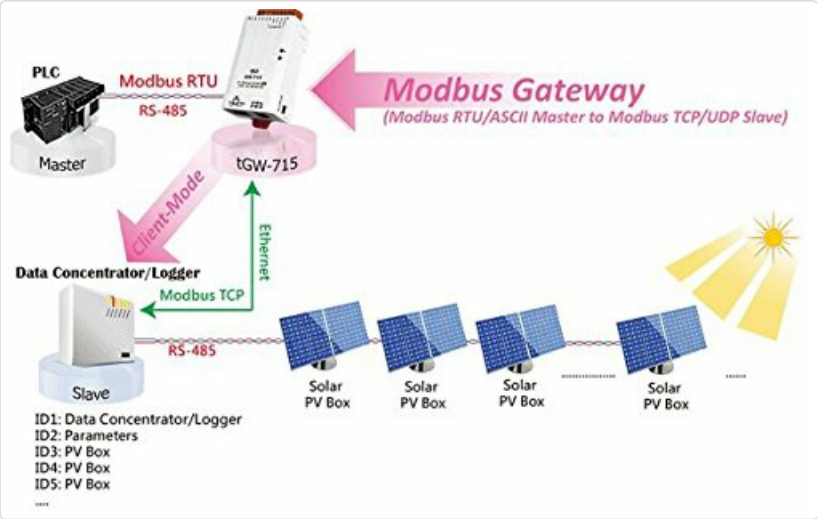

Figure 5.2: The compact design of the tGW-725 makes it suitable for various applications, including factory, building, and home automation, as well as remote diagnosis and management.

Figure 5.3: An example of a Modbus Gateway application where a PLC master communicates with a data concentrator/logger (slave) via the tGW-725 (represented by tGW-715) to monitor solar PV boxes.

6. Specifications

Feature	Value
Model Number	tGW-725
Package Dimensions	10 x 5 x 4 inches
Item Weight	16 ounces
Manufacturer	ICP DAS
Ethernet	10/100 Base-TX, RJ-45 x 1 (Auto-negotiating, auto MDI/MDIX)
Serial Ports	2 x RS-485 (2-wire)

Feature	Value
Power Input	PoE (IEEE 802.3af, Class 1) or 12~48 VDC via DC jack
Protocols Supported	TCP, UDP, HTTP, DHCP, BOOTP, TFTP
Modbus Modes	Modbus TCP/UDP Master/Slave, Modbus RTU/ASCII Master/Slave
CPU	32-bit MCU

7. Troubleshooting

If you encounter issues with your tGW-725 gateway, consider the following common troubleshooting steps:

- **No Power:** Verify that the power supply (PoE or DC adapter) is correctly connected and providing the specified voltage. Check power indicator LEDs.
- **No Network Connectivity:** Ensure the Ethernet cable is securely connected to both the gateway and the network switch/router. Check the Link/Act LED on the Ethernet port. Confirm network settings (IP address, subnet mask, gateway) are correctly configured via the web interface.
- **Modbus Communication Failure:**
  - Verify Modbus parameters (baud rate, data bits, parity, stop bits) match between the gateway and the serial slave devices.
  - Check RS-485 wiring for correct polarity (D+, D-) and termination resistors if necessary.
  - Ensure the Modbus slave addresses are unique and correctly configured.
  - Confirm the gateway's Modbus TCP port is open and not blocked by a firewall.
- **Web Interface Inaccessible:** Ensure your computer is on the same network segment as the gateway. Try pinging the gateway's IP address. If the IP address is unknown, use the UDP responder for device discovery or reset the device to factory defaults (refer to the full manual for reset procedures).

For more detailed troubleshooting, refer to the complete product manual available on the ICP DAS website.

8. Maintenance

The ICP DAS tGW-725 is designed for robust industrial use and requires minimal maintenance.

- **Cleaning:** Periodically clean the exterior of the device with a soft, dry cloth. Do not use liquid cleaners or solvents.
- **Firmware Updates:** Regularly check the ICP DAS website for new firmware versions. Updating the firmware can provide performance improvements, new features, and security patches.
- **Environmental Conditions:** Ensure the device operates within its specified temperature and humidity ranges to prevent damage and ensure optimal performance.
- **Cable Integrity:** Inspect all connected cables (Ethernet, power, RS-485) periodically for any signs of wear or damage. Replace damaged cables immediately.

9. Warranty and Support

ICP DAS products typically come with a standard manufacturer's warranty. For specific warranty terms and conditions, please refer to the warranty information provided with your purchase or visit the official ICP DAS website.
For technical support, product documentation, and driver downloads, please visit the ICP DAS USA website or contact their customer support team. When contacting support, please have your product model number (tGW-725) and any relevant purchase information ready.
Manufacturer: ICP DAS

Website: www.icpdas-usa.com (or relevant regional site)