GRID45™-MB

Secure Industrial Networking Module

MODBUS TCP ETHERNET MODULE FOR BRIDGING MODBUS ASCII / RTU DEVICES

The GRID45™ is a complete Ethernet wired and wireless module with built-in Industrial network protocols. The GRID45 is designed to allow OEMs to quickly and easily add IIoT network protocols to any product. Flexible configuration modes and the built-in application firmware make for easy Integration, low design risk and allows for quick time to market. By using the built-in WEB interface, or the web API, this module can be quickly and securely configured and provisioned on your network. The GRID45 can also be configured by your host processor on power up thru the UART interface. In addition, the module completely offloads the industrial protocol communications (Ethernet traffic) from the host processor.

The GRID45 has all of the integrated hardware and application firmware needed for new and existing Industrial protocol applications. The module has an integrated Ethernet PHY and a crypto authentication chip that makes it easy to add secure Industrial Ethernet connectivity to your product. Furthermore, the module has Wi-Fi and Bluetooth built-in which add additional connectivity and configuration possibilities.

GRID45 Modbus TCP Overview

The GRID45 Modbus TCP module makes it easy for OEMs to add Modbus TCP Ethernet to their products. The GRID45 is designed to connect directly to a UART interface on a host processor. If the product is already using Modbus RTU/ASCII through a serial port, in most cases, it can become a Modbus TCP Ethernet port with little to no changes to the embedded host firmware. The GRID45 Modbus firmware is optimized to bridge Modbus TCP to a Modbus serial server. It will map all current Modbus commands and registers from Modbus TCP to Modbus serial commands and registers. As a result, the GRID45 will send and receive your serial Modbus data transactions and convert them to Modbus TCP transactions over the network. As an OEM option, the GRID45 Modbus module can work with proprietary serial protocols or Modbus client applications.

Modbus TCP offers several advantages over Modbus RTU. Modbus TCP allows users to send and receive data over a standard Ethernet network and to take advantage of larger wide area networks. Modbus TCP also allows multiple Modbus clients to communicate with multiple Modbus servers. Also, Modbus TCP supports more Modbus servers (slaves) to be used in the network.

Grid Connect also offers this Modbus functionality in a couple of different Modbus TCP gateway products. See the NET232-MB or the GRID485 products for more details.

KEY Features and Benefits

- Fast integration to add Modbus TCP networking to any product. Minimal engineering effort. Low design risk. Offloads network processing from a host processor.

- Secure, integrated compact module that can be easily integrated into an OEM product. Connect Modbus ASCII or RTU server devices to a Modbus TCP application.

- GRID45 supports multiple industrial protocols in the same software and hardware footprints.

- Wireless 802.11BGN interface, BT/BLE 4.2 and Integrated 10/100 PHY for Wired Ethernet.

- Cloud management— remote FW updates, Configuration updates. OEM option.

- Industrial temp range: -40°C to +85°C
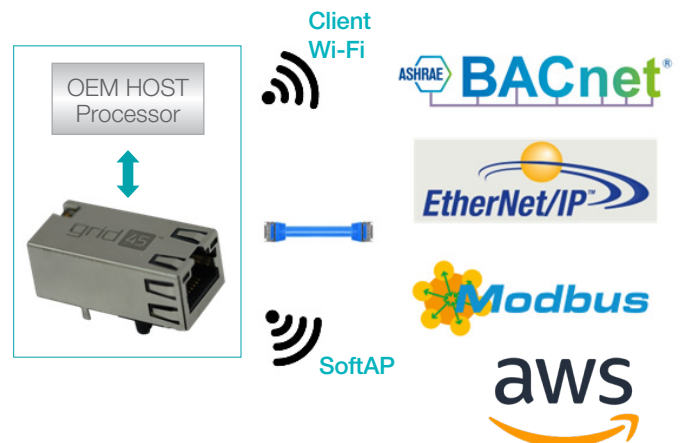
Features and Specifications

Network

Wired Ethernet Specifications

- Integrated IEEE802.3/802.3u compliant Media Access Controller (MAC) with Physical Layer Transceiver (Fast Ethernet PHY)
- 10BASE-T and 100BASE-TX Ethernet
- 10 Mbps and 100 Mbps rates, Auto negotiation
- Auto-MDIX support. Auto configures connection for straight through or crossover cable

Wireless LAN Specifications

- 802.11 b/g/n internal Wi-Fi controller 2.4GHz-2.5GHz
- Data rates: 802.11b/g up to 54 Mbps; 802.11n (1x1) up to 150 Mbps
- Support for concurrent Client Station and SoftAP connections
- SoftAP Wi-Fi interface supports up to 4 Wi-Fi client connections (with DHCP)
- External Antenna required. Antenna is connected to a W.FL connector (compatible with MHF3 and AMMC). The W.FL connector must be insulated to protect the signal integrity from the GRID45 shield
- Ethernet to Wi-Fi client bridging available as an OEM option

Protocol Support

Modbus TCP

- Modbus Serial (RTU or ASCII) to Modbus TCP over Ethernet or Wi-Fi
- MQTT (OEM option)
- TCP, UDP Data Tunnel (OEM Option)

General Protocol Support

- DHCP Client, Server (Soft AP), HTTP Server/Client
- IPv4, IPv6, TCP/IP, UDP/IP, ICMP

Security and Authentication

Security

- Secure Boot – OEM option
- Flash Encryption
- TLS Server/Client – TLS 1.2
- The SHA Accelerator supports four algorithms of FIPS PUB 180-4, specifically SHA-1, SHA-256, SHA-384 and SHA-512
- Optional 128, 256 bit AES encryption of data

CryptoAuthentication™

- ATECC608A Crytographic Co-Processor
- Protected storage for up to 16 keys, certificates or data

Management Interfaces

- Internal Web Server (HTTP/HTTPS)
- Serial Port (AT-Command)
- WEB API/JSON
- TELNET
- Soft/AP Option

Serial Interface

- Serial Port: Data Rates to 921 kbps (Asynchronous)
- Characters: 7 or 8 data bits
- Parity odd, even, none
- Stop bits: 1, 1.5 or 2
- Control lines DTR/DCD, Flow Control RTS/CTS, xOn/xOff
- System Pins: Reset, Power, Gnd
- 3 GPIO Pins (OEM Option)
- TX, RX and GPIO Pins are +5v tolerant

Indicators (LED)

- 10 Base-T Connection
- 100 Base-T Connection
- Link and Activity Indicator, Full/Half Duplex

Operating Conditions

- Operating temperature: -40°C to +85°C
- Storage temperature: -40°C to +85°C

Power

- Input Voltage 3.3VDC
- Max Current Consumption ~ 500mA

Dimensions/Package and Weight

- 34 x 16.3 x 13.5mm (1.34 x .64 x .53inch)
- Weight – 10 grams, .35 oz

Certifications & Compliance

Radio Approvals

- FCC Part 15, CE, RoHS

Emissions / Immunity

- FCC Part 15 Class B, ICES-003, RSS-247, EG 203 367 v1.1.1, EN 300 328 V2.2.2, EN 55032, EN 55035, EN 61000-6-2, EN 61000-6-4, ETSI EN 301 489, EN 55035

Environmental

- Temperature: IEC 60068-2-1; IEC 60068-2-2; IEC 60068-2-78
- Vibration / Shock: IEC 60068-2-6; IEC60068-2-27

Ordering Information

GRID45-MBTCP	GRID45 with Modbus TCP FW in trays
GRID45-MBTCP-S	GRID45 with Modbus TCP FW in sample package
GRID45-EVAL-BD-110	GRID45 evaluation kit. US Power. Includes board, USB micro cable, w.fl to RSMA cable and 110V/+5 Volt power supply. Order Module separate.
GRID45-EVAL-BD-U	GRID45 evaluation kit. Includes board, USB micro cable, w.fl to RSMA cable and 110/220V/+5 Volt power supply with euro plug. Order Module separate.

Quick Links - www.gridconnect.com/grid45-MB

1630 W. DIEHL ROAD, NAPERVILLE, IL 60563
630-245-1445 GRIDCONNECT.COM

gridconnect.