GRID45™-EIP

Secure Industrial Networking Module

ETHERNET/IP NETWORK INTERFACE MODULE

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 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 Ethernet/IP Overview

The GRID45 Module allows Device Manufacturers to easily add industrial protocol connectivity to their products or machines. It offers device manufacturers and OEMs the smallest embedded gateway solution in the market.

- Easily integrate an EtherNet/IP adapter interface into your Product or device. Any host processor with a serial interface can easily add Ethernet-based communication protocols with a simple PCB redesign.
- Supports multiple Industrial Protocols in a compact RJ45 package. Adding EtherNet/IP, Modbus TCP and BACnet to your product no longer requires extensive, costly or complicated engineering design and development.
- Easily bridge your Modbus RTU/ASCII interface to EtherNet/IP. The GRID45-EIP is an intelligent RJ45 connector with a Modbus serial and a EtherNet/IP adapter stack built-in. The GRID45-EIP firmware can map your product's Modbus serial data (or proprietary serial data) so you don't have to change any application code. The GRID45's firmware can map data to and from your device for presentation on EtherNet/IP, Modbus TCP and BACnet/IP networks.
- Eliminate the Overhead of Protocol Development and Deployment. Deploying and maintaining multiple Industrial Automation protocols is difficult (if not impossible) for most device manufacturers. The resources required are immense and the learning curve can be steep which only adds to the overhead costs. The GRID45 module provides the protocol expertise and support throughout the life of your product.

Grid Connect also offers a box version of the GRID45-EIP. The NET485-EIP-MB is a panel/DIN rail mountable Modbus Serial to EtherNet/IP adapter.

Note: EtherNet/IP (Ethernet Industrial Protocol) is a specific application layer protocol used in advanced industrial automation environments and is not short-hand for Ethernet Internet Protocol.

See **odva.org/technology-standards/key-technologies/ethernet-IP/** for more details.

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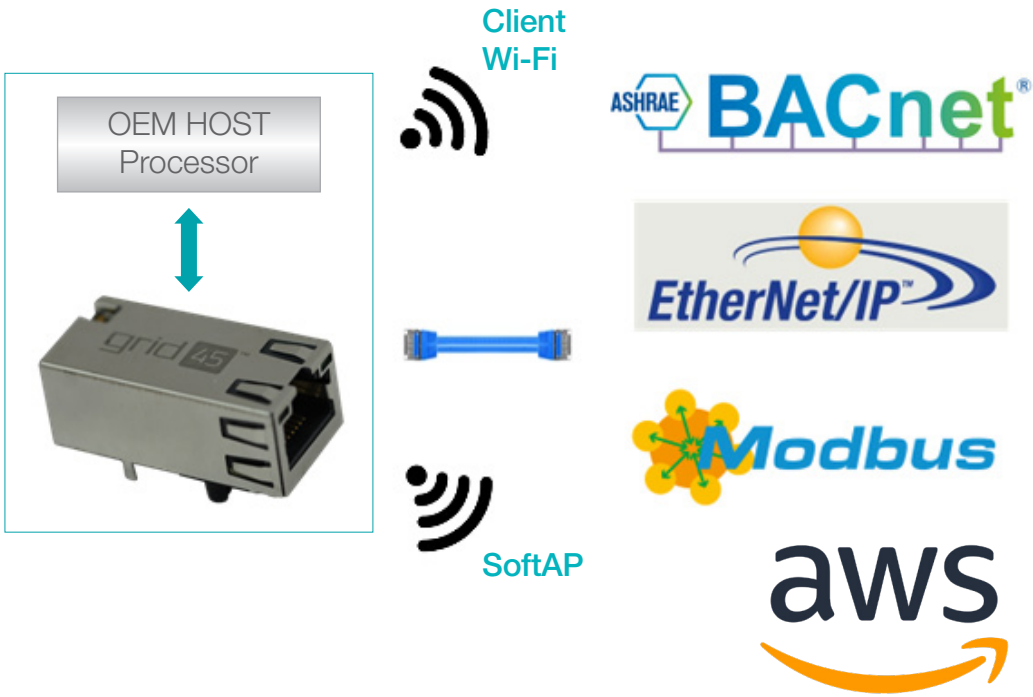
KEY Features and Benefits

- Fast integration to add EtherNet/IP networking to any product. Minimal engineering effort. Low design risk. Offloads network processing from a host processor.
- The GRID45 supports multiple Industrial Protocols (EtherNet/IP, Modbus TCP, BACnet and Profinet released Q3 2024) in an easy to integrate module.
- Compact Embedded EtherNet/IP Adapter Interface. Small RJ45 Size Device (33.9 x 16.25 x 13.5 mm)
- Industrial Temperature Range -40°C to +85°C
- Integrated 10/100 PHY for Wired Ethernet, Wireless 802.11BGN interface and BT/BLE 4.2 interfaces
- Cloud management—remote FW updates, configuration updates. (OEM option)
- OEM customizations available
- Pre-certified for EtherNet/IP conformance to assure ODVA conformance.



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

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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

EtherNet/IP

- EtherNet/IP Adapter (slave) interface.
- From the Device Manufacture's host controller, Modbus RTU/ASCII serial data can be easily mapped to EtherNet/IP objects. Proprietary serial data can also be mapped as an OEM option.
- EtherNet/IP Adapter/Slave interface
  - Support for Generic Device profile
  - Customized identity information
  - Multiple I/O assembly support

General Protocol Support

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

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
- WEB API/JSON
- Soft/AP Option

Serial Interface

- Serial Port: 9,600 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-EIP-Q	GRID45 with Ethernet/IP Qualification firmware in sample package
GRID45-EIP-S	GRID45 with Ethernet/IP 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.

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