

UEIModbus 300/600

Modbus® TCP based I/O Cubes

- Uses industry standard Modbus TCP interface
- Flexible enough to match your application
- Over 30 I/O boards available
- Standard Ethernet 100Base-T Interface (Fiber interface available)
- Inter-Cube sync interface
- Built-in Ethernet switch/router allows expandability to 64 cubes
- Rugged:
 - Tested -40° to +85° C
 - Tested 5g vibration, 50g shock
- Compact
 - 4" x 4" x 4" provides 3 I/O slots (UEIModbus 300)
 - 4" x 4" x 5.8" provides 6 I/O slots (UEIModbus 600)
- DIN rail, 19" rack or Flange mounting options

10-Year
Availability
Guarantee



General Description:

The UEIModbus Cube is a compact, rugged, Ethernet based data acquisition and control interface that communicates with a host computer or PLC over Modbus TCP. Its flexibility allows you to configure one or more cubes to match the specific I/O requirements of your application. The UEIModbus is ideally suited for a wide variety of industrial monitoring and control applications.

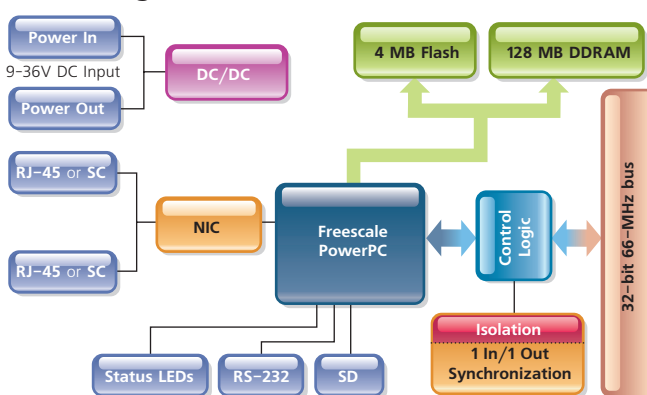
The Modbus messaging protocol was developed by Modicon in 1979 and is used to establish master-slave/client-server communication between intelligent devices. It is a defacto standard, truly open and the most widely used network protocol in the industrial manufacturing environment.

Modbus devices communicate using a master-slave configuration. Only one device (the master) can initiate transactions (called queries). The other devices (slaves) respond by supplying the requested data to the master, or by taking the action requested in the query.

The UEIModbus Cube functions as a Modbus slave that is easily accessed by any software client acting as a Modbus master. Most popular HMI software supports the Modbus protocol.

The UEIModbus supports all AI, AO, DI, DO and CT layers that are compatible with UEI's Cube architecture. (Other Cube-based products include the PowerDNA®, UEILogger™ and UEIPAC™ families.) Analog input channels are read using two input registers encoded as a single 32-bit floating point value. Analog output channels are written to using two holding registers encoded as one 32-bit floating point value. Digital input ports are read using one or two input registers (depending on the port width). Each digital input line is also available as a discrete input register. Digital output ports are written using one or two holding registers (depending on the port width) and similar to the digital inputs, each digital output line is also available as a coil register. Counter or quadrature encoder inputs are read using one or two input registers (depending on the counter resolution).

Block Diagram:



The heart of every UEIModbus system is the Cube, which is available in two sizes. The UEIModbus 300 cube is 4" x 4" x 4" and provides 3 I/O slots while the UEIModbus 600 is 4" x 4" x 5.8" and offers 6 I/O slots. You select the I/O boards installed in the cube to match your application. There are currently over 30 different I/O boards available covering analog input and output, digital I/O, counter/timers, and quadrature encoders.

Each I/O Cube consists of two primary subsections: a Core Module and I/O slots or layers. The Core Module occupies the top portion of the Cube and provides the PowerPC CPU running the Modbus TCP server software. The core modules also provides the Ethernet Network Interface Controller (NIC), indicator lights, timing/trigger interface, configuration ports and internal power supply. It's the brains of the Cube and controls the unit's operations including reading and writing to the I/O boards in the cube.

The remainder of the UEIModbus Cube is dedicated to I/O slots or layers. These slots are populated with I/O modules selected to match your application. With over 30 different I/O boards available, we're sure to have just what your application requires. We offer: Analog input boards to measure voltage, current, strain gages, thermocouples and more, Analog output boards with outputs to $\pm 40V$ or ± 50 mA, Digital

I/O interfaces for logic and "real-world" signal levels, counters/timers, and quadrature encoder inputs.

The UEIModbus cubes offer a wide variety of mounting options. A flange kit is available that allows the cubes to be mounted to a wall or other flat surface. Rack kits and DIN Rail kits are available to allow mounting in 19" racks or on DIN rails, respectively.

Whether your application requires a few I/O channels or a few thousand, the UEIModbus 300 and 600 Cubes are an ideal solution in your Modbus based application. The Cube's unique combination of flexibility, compact size, mechanical and electrical ruggedness, and ease of use is unparalleled.

Technical Specifications:

Standard Interfaces	
To Host Computer	10/100Base-T, standard RJ-45 connector
Daisy chain output	10/100Base-T, standard RJ-45 connector
Config/General	RS-232, 9-pin "D"
Sync	Custom cable to sync multiple cubes
I/O Slots Available	
UEIModbus 600	6 slots
UEIModbus 300	3 slots
Host Communications	
Distance from host	100 meters max, CAT5 cable. Optional fiber interface allows up to 20 kilometers
Processor	
CPU	Freescall MPC5200, 400 MHz, 32-bit
Memory	128 MB (not including on-board Flash Memory which contains OS kernel, I/O drivers and firmware)
Status LEDs	Attention, Read/Write, Power, Communications Active
Environmental	
Temp (operating)	Tested to -40 °C to 85 °C
Humidity	0 to 95%, non-condensing
Vibration	
(IEC 60068-2-64)	10–500 Hz, 5 g (rms), Broad-band random
(IEC 60068-2-6)	10–500 Hz, 5 g, Sinusoidal
Shock	
(IEC 60068-2-27)	50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations
Altitude	70,000 feet, maximum
Physical Dimensions	
UEIModbus 300	4" x 4" x 4"
UEIModbus 600	4" x 4" x 5.8"
Power Requirements	
Voltage	9 - 36 VDC (AC adaptor included)
Power Dissipation	4 W at 24 VDC (not including I/O boards)

UEIModbus Advantages:

Easy to configure and deploy

- Uses standard Modbus TCP protocol
- Over 30 different I/O boards available
- Built-in signal conditioning
- Flange kit for mounting to wall/flat surface
- DIN rail and Rack Mount kits
- Standard "Off-the-shelf" products and delivery

Flexible Connectivity

- 100Base-T with Cat-5 cable
- 10/100Base-FX Fiber interface available
- Supports WIFI / GSM / Cell networks
- Built-in Ethernet switch allows daisy chain

Compact Size: UEIModbus 600 @ 4" x 4" x 5.8" allows:

- 150 analog inputs per cube,
- 48 analog outputs per cube
- 288 digital I/O bits per cube.
- 48 counter/timer channels per cube
- 48 quadrature encoder inputs per cube

Low Power:

- Less than 15 watts per cube
- AC, 9-36 VDC or battery powered.

Rugged and Industrial:

- Operation tested from -40°C to 85°C
- Vibration tested to 5 g, (operating)
- Shock tested to 50 g (operating)
- All I/O isolated from Cube and host PC.

UEIModbus Cube Interface:

A Network Connectors

Ethernet in from host PC or from another Cube; second connector daisychains to another Cube. 100-Base FX optical interface is available for up to 20 km spacing.

B USB Port

USB Ver 1.1 port is not currently active.

C SD Card Slot

Secure Digital (SD) Card slot for onboard data storage for UEI-Logger and UEIPAC series cubes.

D Serial Port

The serial port is used to change the configuration of the UEI-Modbus cube. From a terminal program, you can change the IP address from the default, if necessary. You also download updated firmware through the serial port.

E I/O Layer Status LEDs

These two green lights give a visual indication of the status of each I/O layer. **RDY** - Ready • **STS** - Status



UEIModbus 300 shown

F I/O Board Slots

UEIModbus cubes provide either 3 or 6 I/O slots. Connect directly to the I/O boards via your custom cabling or take advantage of our external screw terminal panels. Boards ordered with your cube are factory installed. You may also add boards or reconfigure a cube in the field

G Sync Connector

High-speed Cube-to-Cube synchronization connector.

H Reset Button

Pressed to prevent accidental activation, this button resets the CPU layer for activities such as downloading and installing new firmware for the Cube.

I Communication Status LEDs

These LEDs monitor communications through the serial and Ethernet ports. **ATT** - Attention • **R/W** - Read/Write • **COM** - Communications active • **PG** - Power Good / Ready

J Power Connectors

Power-In, 9-36V DC from the DNA-PSU-24 (included), a user-supplied DC source, or daisychained from another PowerDNA Cube. **Power-Out** may be daisychained to another Cube, if desired.

Ordering Guide:

Part Number	Description
UEIModbus Cubes (includes universal AC power supply, serial and ethernet cables)	
UEIModbus 300	MODBUS TCP based, 100Base-T I/O Cube, 3 I/O slots, PowerPC CPU, sync interface
UEIModbus 600	MODBUS TCP based, 100Base-T I/O Cube, 6 I/O slots, PowerPC CPU, sync interface
UEIModbus 300-1G	MODBUS TCP based, 100Base-T GigE I/O Cube, 3 I/O slots, PowerPC CPU, sync interface
UEIModbus 600-1G	MODBUS TCP based, 100Base-T GigE I/O Cube, 6 I/O slots, PowerPC CPU, sync interface