MODBUS and EtherCAT
in Automation1

Industrial Ethernet

Expand Your Automation Solution

Industrial Ethernet (IE) is enhanced with determinism and real-time control for use within an industrial setting. Automation1 PC-based controllers support Modbus TCP/IP IE protocols, while Automation1 drive-based controllers support EtherCAT IE protocols. Supporting IE protocols makes Automation1 controllers highly expandable. Data items on the IE networks are mapped to registers in the Automation1 controller, making the networked devices directly accessible to the Automation1 controller and vice versa. Expanded control of both protocols (and more) is planned in Automation1.

Automation1

Automation1 Industrial Ethernet support is part of the user-friendly Automation1 motion control platform, which includes the following:

- **Development Software**
- **Controls**
- **Motor Drives**
- **Fiber-Optic HyperWire® Communication Bus**

KEY FEATURES:

- Brings **ETHERCAT SUPPORT** to Automation1 drive-based controllers
- Brings **MODBUS SUPPORT** to Automation1 PC-based controllers
- Enables **EXPANSION OF YOUR CONTROL ARCHITECTURE**
- Allows for integrating Automation1 into **LARGER AUTOMATION SYSTEMS**
- Enables **EXPANSION OF I/O** on a machine controlled by Automation1

INDUSTRIAL ETHERNET SUPPORT		
Industrial Ethernet Functionality	**MODBUS**	**EtherCAT**
Compatible with PC-Based Automation1 Controller	Yes	No
Compatible with Drive-Based Automation1 Controller	No	Yes
Base Offering	Connect to 1 MODBUS Client Connect to 1 MODBUS Server	Connect to 0 EtherCAT networks.
Offering with -CP1 Controller Plus Option*	Connect to 1 MODBUS Client Connect to 16 MODBUS Servers	n/a
Offering with -IE2 Industrial Ethernet Option*	n/a	Connect to 1 EtherCAT network (via ESI file to network controller).
Data Access	MODBUS Client InputWords (Read-Only) OutputWords (Read/Write) InputBits (Read-Only) OutputBits (Read/Write) OutputWordsStatus (Read-Only) OutputBitsStatus (Read-Only) MODBUS Server InputWords (Read/Write) OutputWords (Read-Only) InputBits (Read/Write) OutputBits (Read-Only)	EtherCAT Device: Rx PDO (Read-Only) (Inputs) Tx PDO (Read/Write) (Outputs)
Status Items / Data Collection *Automation1 supplies many Modbus/EtherCAT status items that you can use directly or through Data Collection.*	MODBUS configuration status items: Modbus Client Connected Modbus Client Error Modbus Server Connected Modbus Server Error Modbus data status items: Modbus Client Input Words Modbus Client Input Bits Modbus Client Input Words Status Modbus Client Output Words Modbus Client Output Bits Modbus Client Output Words Status Modbus Server Input Words Modbus Server Input Bits Modbus Server Output Words Modbus Server Output Bits	EtherCAT configuration status items: EtherCAT Connected EtherCAT Error PDO data status items: EtherCAT Rx Pdo Size EtherCAT Tx Pdo Size EtherCAT Rx Pdo EtherCAT Tx Pdo
Networking Interface	Supported families of network cards: Broadcom Gigabit (bge1g.rsl) Intel 10/100Mbps (ie100m.rsl) Intel Gigabit (ie1g.rsl) RealTek 10/100 Mbps (rtl100m.rsl) RealTek Gigabit (rtl1g.rsl)	100BASE-TX network ports on drive-based controllers.
Supported Automation1 hardware	Automation1-iPC	Automation1-iXC6e Automation1-iXC4e Automation1-iXC4 Automation1-iXC2e Automation1-iXC2 Automation1-iXL5e Automation1-iXL2e Automation1-iXI4 Automation1-iXR3
*Note: Options are ordered as part of the Automation1-iSMC configuration.		

MODBUS TCP/IP

Modbus TCP/IP is an extension of the Modbus family of vendor-neutral communication protocols used for supervision and control of automation equipment. Specifically, it provides a network and transport layer in an Internet environment over the TCP/IP protocols for the Modbus application layer. The most common use of the protocol is for communication with Ethernet-based PLCs, I/O modules and other simple field buses or I/O networks. The Modbus TCP/IP protocol is an automation standard.

ETHERCAT

EtherCAT stands for Ethernet for Control Automation Technology. It is a real-time communication protocol over standard Ethernet hardware / networks. In EtherCAT, the network topology has one central controller that manages the communication of up to N (65,535) other devices. EtherCAT devices transfer data “on the fly,” enabling high speed, high throughput communication over the Ethernet physical layer.