

AEROTECH AUTOMATION1

MODBUS and EtherCAT in Automation1 **Industrial Ethernet**

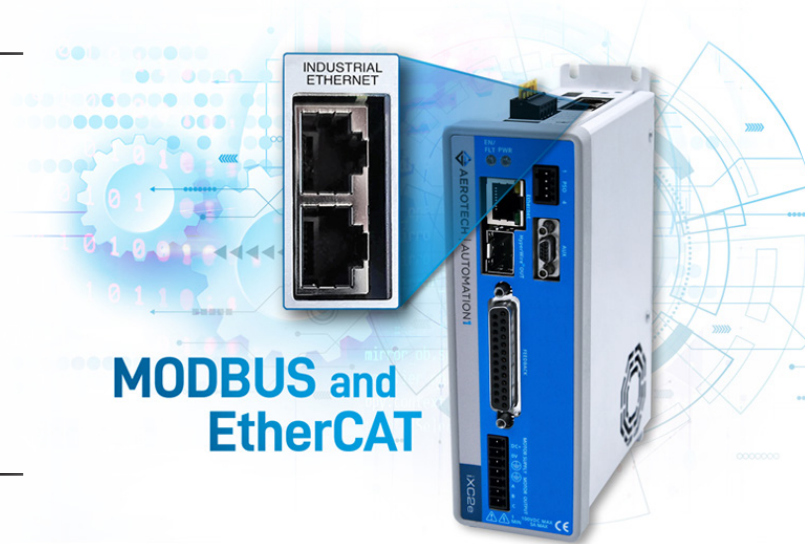
Expand Your Automation Solution

Industrial Ethernet (IE) is enhanced with determinism and real-time control for use within an industrial setting. All Automation1 PC-based and drive-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:

- ◆ **ETHERCAT SUPPORT** for Automation1 drive-based controllers
- ◆ **MODBUS SUPPORT** for all Automation1 control hardware
- ◆ 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

AUTOMATION1 INDUSTRIAL ETHERNET SUPPORT

INDUSTRIAL ETHERNET SUPPORT		
Industrial Ethernet Functionality	MODBUS	EtherCAT
Compatible with PC-Based Automation1 Controller	Yes	No
Compatible with Drive-Based Automation1 Controller	Yes	Yes
Base Offering	Connect to 1 MODBUS Client Connect to 1 MODBUS Server	Connect to 0 EtherCAT networks.
Offering with -CP1 Controller Plus Option¹	Connect to 1 MODBUS Client Connect to 16 MODBUS Servers	n/a
Offering with -IE2 Industrial Ethernet Option¹	Connect to 1 MODBUS Client Connect to 16 MODBUS Servers	Connect to 1 EtherCAT network (via ESI file to network controller).
Data Access	<p align="center"><u>MODBUS Client</u></p> InputWords (Read-Only) OutputWords (Read/Write) InputBits (Read-Only) OutputBits (Read/Write) OutputWordsStatus (Read-Only) OutputBitsStatus (Read-Only) <p align="center"><u>MODBUS Server</u></p> InputWords (Read/Write) OutputWords (Read-Only) InputBits (Read/Write) OutputBits (Read-Only)	<p align="center"><u>EtherCAT Device:</u></p> Rx PDO (Read-Only) (Inputs) Tx PDO (Read/Write) (Outputs)
Status Items / Data Collection <i>Automation1 supplies many Modbus/EtherCAT status items that you can use directly or through Data Collection.</i>	<p><u>MODBUS configuration status items:</u></p> Modbus Client Connected Modbus Client Error Modbus Server Connected Modbus Server Error <p><u>Modbus data status items:</u></p> 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	<p><u>EtherCAT configuration status items:</u></p> EtherCAT Connected EtherCAT Error <p><u>PDO data status items:</u></p> EtherCAT Rx Pdo Size EtherCAT Tx Pdo Size EtherCAT Rx Pdo EtherCAT Tx Pdo
Networking Interface	<p><u>Supported families of network cards:</u></p> Broadcom Gigabit (bge1g.rsl) Intel 10/100Mbps (ie100m.rsl) Intel Gigabit (ie1g.rsl) RealTek 10/100 Mbps (rtl100m.rsl) RealTek Gigabit (rtl1g.rsl) <p>100BASE-TX network ports on drive-based controllers.</p>	100BASE-TX network ports on drive-based controllers.

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Industrial Ethernet Functionality	MODBUS	EtherCAT
Supported Automation1 hardware	Automation1-iPC ² Automation1-iXC6e ² Automation1-iXC4e ² Automation1-iXC4 ² Automation1-iXC2e ³ Automation1-iXC2 ³ Automation1-iXA4 ⁴ Automation1-iXL5e ² Automation1-iXL2e ³ Automation1-iXI4 ² Automation1-iXR3 ²	Automation1-iXC6e ² Automation1-iXC4e ² Automation1-iXC4 ² Automation1-iXC2e ³ Automation1-iXC2 ³ Automation1-iXA4 ⁴ Automation1-iXL5e ² Automation1-iXL2e ³ Automation1-iXI4 ² Automation1-iXR3 ²
<p>1. Options are ordered as part of the Automation1-iSMC configuration.</p> <p>2. Required ethernet ports are part of the base hardware configuration. For the Automation1-iPC, additional ports can be added.</p> <p>3. Required ethernet ports are optional with the -EB2 expansion board option. The -EB1 and -EB2 expansion boards cannot be used concurrently.</p> <p>4. Required ethernet ports are optional with the -IE1 option.</p>		

AUTOMATION1 INDUSTRIAL ETHERNET SUPPORT

MODBUS TCP/IP
<p>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.</p>

ETHERCAT
<p>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.</p>

