DATASHEET

Modbus Master/Slave Communication Module
MVI56E-MCM/MCMXT

The MVI56E Enhanced Modbus Master/Slave Communication Modules allow Rockwell Automation® ControlLogix® processors to easily interface with devices using the Modbus RTU/ASCII serial communications protocol.

The MVI56E-MCM and MVI56E-MCMXT act as input/output modules on the ControlLogix backplane, making Modbus data appear as I/O data to the processor. Data transfer to and from the processor is asynchronous from the communications on the Modbus network. Two independently configurable serial ports can operate on the same or different Modbus networks. Each port can be configured as a Modbus Master or Slave, sharing the same user-controlled 5000-word database.

The two modules are functionally the same. The MVI56E-MCM is designed for standard process applications. The MVI56E-MCMXT is designed for the Logix-XT™ control platform, allowing it to operate in extreme environments. It can tolerate higher operating temperatures, and it also has a conformal coating to protect it from harsh or caustic conditions.

Features	Benefits
Backward Compatibility	♦ All MVI56E products are backward-compatible with earlier MVI56 modules allowing direct replacement without the need to change existing controller programs ♦ Enjoy Enhanced features and flexibility without incurring expensive reprogramming costs
RSLogix™ 5000 Integrated	♦ Module configuration and communication is integrated within RSLogix™ 5000 ♦ No additional programming or configuration software is required ♦ Add-On Instruction for RSLogix 5000 version 16 or higher cuts development time and costs
CIPconnect® -enabled	♦ ProSoft Configuration Builder software (PCB), with CIPconnect®, facilitates remote user access across the ControlLogix backplane through Rockwell Automation's 1756-ENBT module ♦ Configure, diagnose, and analyze process data and communications status ♦ CIPconnect can bridge through multiple ENBT/CNBT links to connect to MVI56E-MCMs installed in remote chassis for configuration and diagnostics
4-digit LED Display	♦ A scrolling display for easily-understood, plain English diagnostic and error information ♦ See critical configuration and status information without connecting to the port

Configuration

All module configuration is defined in the Sample Ladder Logic. The sample ladder is fully commented, and includes user-defined data types, ladder rungs and controller tags. For most applications, the sample ladder can be used without modification.

The MVI56E-MCM Setup Guide and sample configuration provide a quick and easy example with step-by-step instructions on how to move data through the module from the MCM network to the processor.

General Specifications

- Backward-compatible with previous MVI56-MCM version
- Single Slot - 1756 ControlLogix® backplane compatible
- 10/100 MB Ethernet port for network configuration and diagnostics with Auto Cable Crossover Detection
- User-definable module data memory mapping of up to 5000 16-bit registers
- CIPconnect®-enabled network diagnostics and monitoring using ControlLogix 1756-ENxT modules and EtherNet/IP® pass-thru communications
- Sample Ladder Logic or Add-On Instruction (AOI) used for data transfers between module and processor and for module configuration
- 4-character, scrolling, alphanumeric LED display of status and diagnostic data in plain English
- ProSoft Discovery Service (PDS) software finds the module on the network and assigns a temporary IP address to facilitate module access

Functional Specifications

The MVI56E-MCM will operate on a Local or Remote rack (For remote rack applications with smaller data packet size please refer to the MVI56E-MCMR product)

- CIPconnect® enabled for module and network configuration using 1756-ENxT module with EtherNet/IP pass-through communications
- Supports Enron version of Modbus protocol for floating-point data transactions
- 4-digit LED Display for English based status and diagnostics information
- PCB includes powerful Modbus network analyzer
- Special functions (command control, event commands, status, and so on) are supported by message transfer (unscheduled) using the MSG instruction
- Error codes, network error counters, and port status data available in user data memory

Slave Specifications

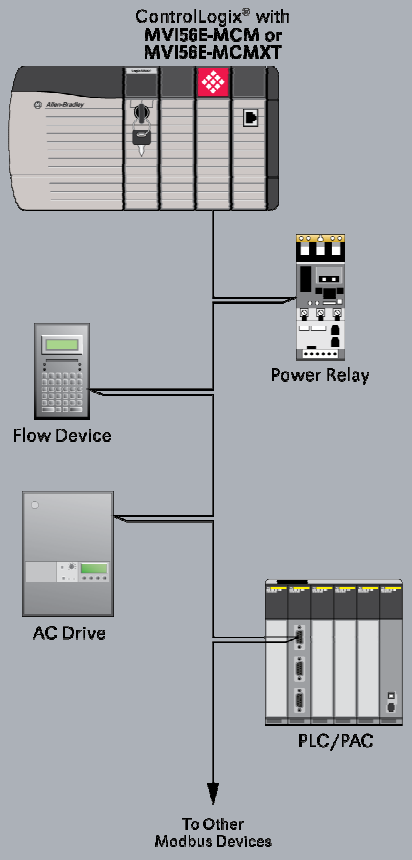
The MVI56E-MCM module accepts Modbus function code commands of 1, 2, 3, 4, 5, 6, 8, 15, 16, 17, 22, and 23 from an attached Modbus Master unit. A port configured as a Modbus Slave permits a remote Master to interact with all data contained in the module. This data can be derived from other Modbus Slave devices on the network, through a Master port, or from the ControlLogix processor.

Master Specifications

A port configured as a virtual Modbus Master device on the MVI56E-MCMR module actively issues Modbus commands to other nodes on the Modbus network. One hundred (100) commands are supported on each port. Additionally, the Master ports have an optimized polling characteristic that polls Slaves with communication problems less frequently. The ControlLogix processor ladder logic can issues commands directly from ladder logic or actively select commands from the command list to execute under ladder logic control.

ProSoft® TECHNOLOGY

ControlLogix™ Modbus Integration



Modbus General Specifications

Communication Parameters	Baud Rate: 110 baud to 115.2 kbps Stop Bits: 1 or 2 Data Size: 7 or 8 bits Parity: None, Even, Odd RTS Timing delays: 0 to 65535 milliseconds
Modbus Modes	RTU mode (binary) with CRC-16 ASCII mode with LRC error checking
Floating Point Data	Floating point data movement supported, including configurable support for Enron and Daniel implementations
Modbus Function Codes	1: Read Coils Status 2: Read Input Status 3: Read Holding Registers 4: Read Input Registers 5: Force (Write) Single Coil 6: Preset (Write) Single Register 8: Diagnostics 15: Force (Write) Multiple Coils 16: Preset (Write) Multiple Data Registers 17: Report Slave ID 22: Mask Write 4x Register 23: Read/Write 4x Registers

Modbus Master Specifications

Command List	Up to 100 commands per Master port, each fully configurable for function code, slave address, register to/from addressing and word/bit count.
Optimized Polling	Configuration options allow Master ports and commands to be optimized to poll slaves with communication problems less frequently.
Command Status/Error Monitoring	Command Status or Error codes are generated for each command as it executes, allowing careful monitoring of communication health between the Master and its Slaves.
Slave Polling Control	Master Port maintains a Slave Status list of all network Slaves. Polling of each Slave may be disabled and enabled using this list.

Modbus Slave Specifications

Full Memory Access	A port configured as a Modbus Slave permits a remote Master to read from or write to any of the 5000 registers that make up the user memory database.
Multi-source Slave Data	Data presented at the Slave port can be derived from other Modbus Slave devices on a different network through the module's Master port or from the processor tag database.
Node Address	1 to 247 (software selectable)
Status Data	Slave port error codes, counters and statuses are available separately for each port when configured as a Slave

Hardware Specifications

General	
Specification	**Description**
Backplane Current Load	800 mA @ 5 Vdc 3 mA @ 24 Vdc
Operating Temperature	0°C to 60°C (32°F to 140°F) - MVI56E-MCM -25°C to 70°C (-13°F to 158°F) - MVI56E-MCMXT
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Extreme/Harsh Environment	MVI56E-MCMXT comes with conformal coating
Shock	30 g operational 50 g non-operational Vibration: 5 g from 10 to 150 Hz
Relative Humidity	5% to 95% (without condensation)
LED Indicators	Battery Status (ERR) Application Status (APP) Module Status (OK)
4-Character, Scrolling, Alpha-Numeric LED Display	Shows Module, Version, IP, Port Master/Slave Setting, Port Status, and Error Information
Debug/Configuration Ethernet port (E1 - Config)	
Ethernet Port	10/100 Base-T, RJ45 Connector, for CAT5 cable Link and Activity LED indicators Auto-crossover cable detection
Serial Application ports (P1 & P2)	
Full hardware handshaking control, providing radio, modem, and multi-drop support	
Software configurable communication parameters	Baud rate: 110 baud to 115.2 kbps RS-232, 485 and 422 Parity: none, odd or even Data bits: 5, 6, 7, or 8 Stop bits: 1 or 2 RTS on/off delay: 0 to 65535 milliseconds
Serial Applications Ports (P1, P2)	RJ45 (DB-9M with supplied adapter cable) Configurable RS-232 hardware handshaking 500V Optical isolation from backplane RS-232, RS-422, RS-485 jumper-select, each port RX (Receive) and TX (Transmit) LEDs, each port
Shipped with Unit	RJ45 to DB-9M cables for each serial port 5 foot Ethernet Straight-Thru Cable (Gray)

Agency Approvals and Certifications

Agency	Applicable Standards
RoHS	
ATEX	EN60079-0 July 2006; EN60079-15 October 2005
CSA	IEC61010
CE	EMC-EN61326-1:2006 EN61000-6-4:2007
CSA CB Safety	CA/10533/CSA IEC 61010-1 Ed. 2 CB 243333-2056722 (2090408)
cULus	
GOST-R	EN61010
Lloyds	Lloyds Register Test Specification Number 1,2002

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Additional Products

ProSoft Technology® offers a full complement of hardware and software solutions for a wide variety of industrial communication platforms.

Compatible products in this product line include:

Modbus Plus Communication Module for ControlLogix (MVI56E-MBP)
Modbus TCP/IP Client/Server Communication Module for ControlLogix (MVI56E-MNET)
Modbus TCP/IP Client Communication Module for ControlLogix (MVI56E-MNETC)

For a complete list of products, visit our web site at: www.prosoft-technology.com

Ordering Information

To order this product, please use the following:

Modbus Master/Slave Communication Module

MVI56E-MCM

To place an order, please contact your local ProSoft Technology distributor. For a list of ProSoft Technology distributors near you, go to: www.prosoft-technology.com and select Distributors from the menu.

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orders@prosoft-technology.com
fax to +1 661.716.5101

Europe / Middle East / Africa
europe@prosoft-technology.com
fax to +33 (0) 5.61.78.40.52