

# Millennium Controller—The Full Featured Programmable Control and Monitoring System

MC-01001B  
Revised 08-04  
Catalog Section 50  
(00-02-0479)



## MC Series

- PC-based programmable logic control and monitoring system. Applications include engine-driven compressors, plus other industrial equipment.
- System is scalable from basics to full featured.
- User programmable with Windows®-based ladder logic software. Allows the operator to implement logic in industry standard format. All I/O points available as ladder logic variables.
- IEC-61131-3 standard programming languages
- Local and remote communications, Modbus RTU via RS485
- Approved for Cl. I, Div. 2, Grps C & D Areas



## Description

MC Series Millennium Controller is a PC-based monitoring, control and data acquisition system. Designed with engine driven compressors in mind, the MC Series is suitable for a wide range of industrial applications. As the heart of the control package, the MC series continuously monitors inputs and set points for correct operation. When an out-of-limit event occurs, the controller provides an alphanumeric readout of critical machinery data or shutdown fault information.

In addition to the shutdown and control functions, the MC series controller provides both local and remote communications of vital equipment and operating data. This advanced system offers multiple options for remote communications. A serial link is provided for programmable logic controllers, PC's and SCADA systems. Radio and satellite communications are

accommodated through the MODBUS RTU protocol.

Operations analysis and maintenance is facilitated by the operation hours and data trending system. The shutdown snapshot feature gives operators a complete picture of system conditions at shutdown.

FWMurphy can custom design a control package to meet your exact specifications. Additionally, a variety of money-saving pre-engineered systems are also available.

## Basic Components

The MC Series consists of a Display Module, a Power Supply with connecting cable, and optional expansion modules and cables.

## Controller Display PC Modules (head)

**MCH-V-M:** 586 compatible processor, 100 MHz; 8MB RAM; VFD Display

## Power Supply

**MCPS-A2:** two analog outputs.

## I/O Expansion Module

**C267:** 8 Digital Inputs, 7 Analog Inputs, Power Supply Monitor, 8 Discrete Outputs. 9 - 28 VDC, 2.25 - 11.2 watts not including max. 18 amps for additional outputs.

**C277:** 18 Thermocouples/ 4-20 mA. 9 to 28 VDC, 0.6 watts

**C287:** 9 to 28 VDC, 3 - 5 watts including 4-20 mA outputs. .

## Cable Assembly

**MCCA72:** Power Supply cable assembly.

## MC Series General Specifications

**Power Input:** 10-32 VDC, 26 watts maximum.

**Operating Temp.:** -40 to 85°C (-40 to 185°F)  
base unit w/VFD -40 to 85°C (-40 to 185°F).

**Programming:** PC-based Ladder Logic.



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The MC Series Millennium Controller is designed to be used only in weatherproof enclosures.*

## Display Module



VFD Display



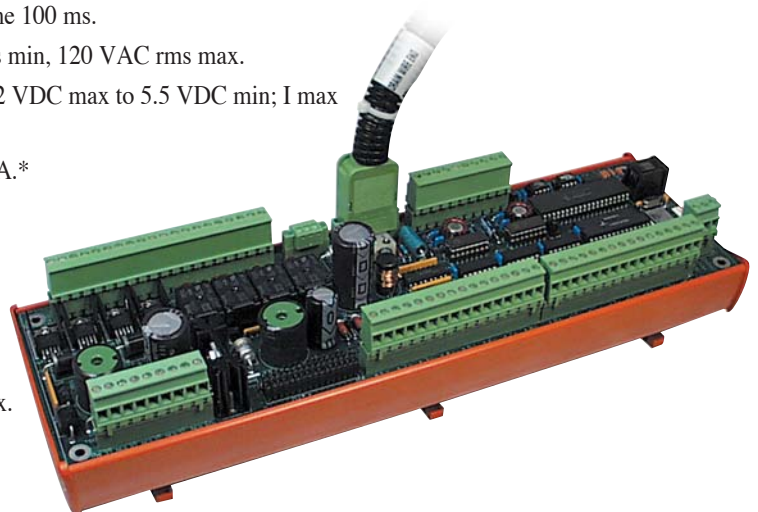
### MCH-V-M Module with Vacuum Fluorescent Display

- 586 compatible microprocessor and includes 8 MB of RAM. Operating temperature for the MCH-V-M is -40 to +85°C (-40 to +185°F).
- 4-lines with 20 characters each, Vacuum Fluorescent Display. Operating temperature for the display is -40 to +85°C (-40 to +185°F) daylight filtered.
- 16-key keypad for user interface for set point entry, alarm acknowledgment, start, stop, reset, etc.
- 4 RS485 Serial Ports for power supply, serial I/O, Modbus slave and spare.
- 2 RS232 Serial Ports for ladder logic programming/monitoring, or remote communications.
- 8 MB DISKONCHIP® for increased data storage capability.

## Power Supply

### MCPS-A2 Power Supply

- 16 Optically-isolated DC Digital Inputs (NO or NC), sink or source, LED indicators, external power supply, or board supplied power, jumper selectable. Approved for use with general purpose switches in hazardous areas.
- V Open Circuit max. 32 VDC, I short circuit max 9.2 mA.
- V Open Circuit min. 10 VDC, I short circuit min 2.5 mA. Scan time 100 ms.
- 1 Magnetic Pickup Input/AC Run Signal: 45 to 10 kHz, 5 VAC rms min, 120 VAC rms max.
- 4 Solid State Relay Outputs: External power must be supplied; 32 VDC max to 5.5 VDC min; I max 3A; short circuit and thermally protected; 100 ms scan time. Inductance 1 H max. @ 0.25 A, 5 mH max. @ 3A.\*
- 4 Mechanical Relay Outputs: Form C contacts:  
Rating: 10 A 125 VAC, 6 A 250 VAC, 1/8 HP 125, 250 VAC,  
5 A 30 VDC 100 ms scan time.\*
- 2 4-20mA Outputs: 1-10 and 1-14 bit resolution.  
max. loop resistance  $RL = (Vps - 3.15)/0.02 \Omega$ .
- 1 RS-485 Serial Port, Modbus RTU Slave 38.4 Kbaud, half duplex.

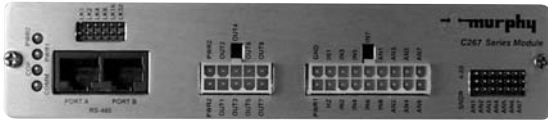


\* Approved for Class I, Division 2, Groups C & D.

# MODBUS RTU I/O Expansion Modules

Any mix of modules may be added.

## C267 Digital Inputs/ Outputs Expansion Module



UL/cUL Listed, Class I, Div. 2 Groups C & D

\* Approved for use with general purpose switches in hazardous areas.

The C267 module adds standard I/O capability to the MC Series Controller through Modbus RTU communication via an RS-485 port. It can read up to eight digital inputs, each input accepts either B+ or B- for activation\*. Features include:

- Seven (7) Analog Inputs, each is hardware selectable to read 4-20 mA, 0-5 VDC. Analog inputs can be configured independently.
- Electric Gauge Sending Units or additional switch inputs.
- Battery Monitor.
- Eight (8) FET outputs suitable for Class I, Div. 2 Hazardous areas. Each output rated at 5 A, total current draw through unit not to exceed 18 A when both PWR2 pins are connected.
- Opto-isolated Frequency Input requiring at least 2 Vrms for activation. Used for speed reference. Range: 60–10,000 Hz.
- RS485 9600-N-8-1 or N, 8, 2 communication port with connection made via modular RJ45 Jack connection available to other expansion modules.



UL/cUL Listed, Class I, Div. 2 Groups C & D

## C277 Thermocouples, 4-20 mA, Expansion Module

The main goal for the C277 module is to add analog input capability to the MC controller through Modbus RTU communication via an RS485 port. It can read up to 18 thermocouples, or mA sources, and transmit this information to the MC controller. Connections are available to other expansion modules. Communication is provided by an RS485 9600-N-8-1 or N, 8, 2 communication port connection available to other expansion modules.



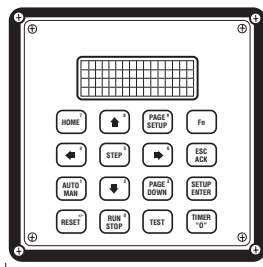
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## C287 Analog Inputs/Outputs Expansion Module

The C287 module adds true 4-20 mA current input and output capability through Modbus RTU communication via an RS485 port. Analog Inputs include four 15-bit true 0-20 mA. Four 16-bit analog outputs are available. Software is configurable to 0-24 mA, 0-20 mA, or 4-20 mA. Communication is provided by an RS485 9600-N-8-1 or N, 8, 2 communication port connection available to other expansion modules.

## Display Module Dimensions

Front View

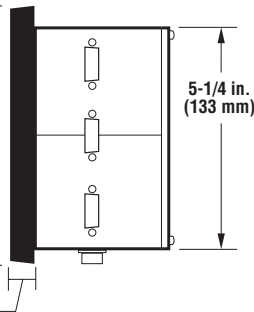


6-1/2 in. (165 mm)

6-1/2 in. (165 mm)

49/64 in. (19 mm)

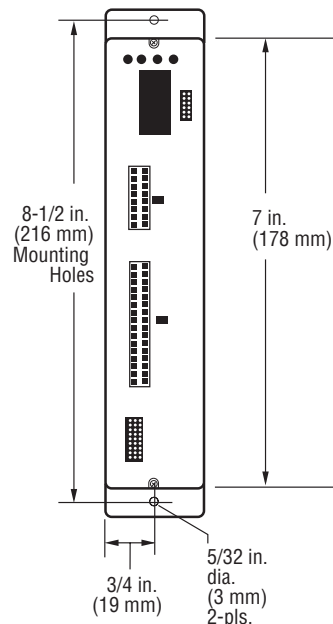
Side View



5-1/4 in. (133 mm)

## Expansion Module

Front View



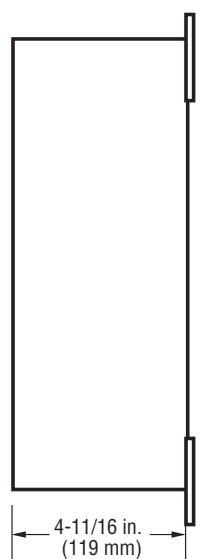
8-1/2 in. (216 mm) Mounting Holes

7 in. (178 mm)

3/4 in. (19 mm)

5/32 in. dia. (3 mm) 2-pls.

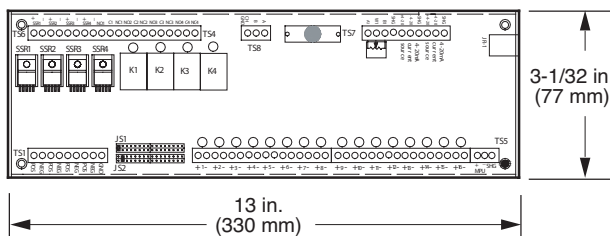
Side View



4-11/16 in. (119 mm)

## Power Supply

Front View



3-1/32 in. (77 mm)

13 in. (330 mm)

Vertical mounting suggested. Harnesses are available.

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## How to Order

### Selecting a Millennium Controller MC Series Model:

- Specify one **MCH-V-M** display module
- Specify one **MCPS-A2** power supply
- Specify one **MCCA72** power supply cable assembly 72 in. (1.82 m)
- Specify optional **I/O expansion modules** from the **Table** below
- Specify **Accessories** for connections of Expansion Modules



**Optional**  
MCCP Hold-up  
capacitor package  
(for 12 VDC cranking  
battery systems)

**Table: MODBUS RTU I/O Expansion Modules**

|                        |   |
|------------------------|---|
| <b>C267 (00004923)</b> | 8 Digital Inputs, 7 Analog Inputs, Power Supply Monitor, 8 Discrete Outputs |
| <b>C277 (00007620)</b> | 18 Thermocouples/4-20 mA  |
| <b>C287 (00005945)</b> | 4 Analog Inputs, 4 Analog Outputs   |

## Accessories

### Cables and Harnesses for All Expansion Modules (C267, C277 C287)

- 00005293 RJ45 cable assembly, 2 ft. (60.96 cm) length
- 00004925 RJ45 cable assembly, 4 ft. (121.92 cm) length
- 00005292 Terminating Resistor Module

### Cables and Harnesses for C267 Only

#### Connection Option 1

- 00007719 Interface Terminal board C267TBIF
- 00007196 Harness, C267 10-wire Molex to C267TBIF
- 00007197 Harness, C267 18-wire Molex to C267TBIF

#### Connection Option 2

- 00004924 Molex-to-raw wires harness, 2 ft. (60.96 cm), 35267HRNSKIT

### Cables and Harnesses for C287 Only

- 00008544 C287 harness kit 35287HRNSKIT

### Configuration and Programming/Software

**ISaGRAF 3.4 256 (WD16)** –Ladder logic (IEC-61131-3) programming and monitoring software for up to 256 tag names

**ISaGRAF 3.4 (WDL)** –Ladder logic (IEC-61131-3) programming and monitoring software for unlimited number of tag names

**MTools** –Display, set point, and alarm screen configuration, initial and default value setting, Modbus register map creation and file transfer utilities.



### Warranty

A limited warranty on materials and workmanship is given with this FWMurphy product.

A copy of the warranty may be viewed or printed by going to [www.fwmurphy.com/support/warranty.htm](http://www.fwmurphy.com/support/warranty.htm)



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