

## MX200 Vacuum Controller

Part Number: 2-7900-03X



### Operating Specifications

<b>Operating Range</b>	1 x 10 <sup>-11</sup> to 10,000 Torr max
<b>Communications (-034)</b>	USB/RS-232/RS-485
<b>Communications (-037)</b>	USB/EthernetIP
<b>Analog Output</b>	0 to 10 VDC (1 per sensor)
<b>Analog Output Resolution</b>	16 Bits
<b>Programmable Set Points</b>	4 per module (8 max)
<b>Set Point Type</b>	Relay
<b>Supply Voltage</b>	115/230 VAC (2/1 A), 50-60Hz
<b>Maximum Power</b>	230 W
<b>Calibration Medium</b>	Dry air or nitrogen
<b>Operating Temperature</b>	0 °C to 50 °C
<b>Storage Temperature</b>	-20 °C to 70 °C
<b>Display Readable Distance</b>	5 m (16 ft)
<b>Maximum Sensors Controlled</b>	10
<b>Maximum Sensors Displayed</b>	8
<b>Response Time</b>	≤10 ms

### Physical Characteristics

<b>Housing</b>	Aluminum
<b>Electrical Connections</b>	Power cord (IEC 60320 C-13)
<b>Weight (base unit)</b>	2.2 kg (5 lbs)
<b>Dimensions</b>	See dimensional drawings

### Features and Benefits

- Rack mountable with a highly configurable design
- USB/RS-232/RS-485 or USB/EthernetIP included on every unit for simple connection with a PC, PLC, or other equipment
- High contrast OLED display with 180° viewing angle
- Selectable units of measurement (Torr, mbar, Pascal)
- Bootloader for field upgradeable firmware
- Gas conversion functions included for Nitrogen/Air, Argon, Hydrogen, Helium, Neon, Krypton, and Carbon Dioxide
- Analog outputs (0 to 10 V DC) for every connected sensor
- User-configurable linear and logarithmic analog output ranges
- Excellent customer support
- (-037) DHCP enable or disable with programmable IP address
- (-037) Status LEDs for network/module status/port data activity
- (-037) 10 / 100 Mbit, half or full duplex port operation
- (-037) Secure web access for network and unit data and settings

### Set Points

The MX200 has up to eight relay set points. The relays are located on two optional relay modules with four set points each. Individual relay statuses are displayed on the front panel. The heavy duty relays have an SPDT (1 Form C) contact form and are rated for 24 V DC. They have a maximum current rating of 8 A at 250 V AC or 5 A at 30 V DC.

### Certifications, Compliance, and Ratings

- Certified to UL 61010-1
- CE certified to EN61326-1:2006
- NIST traceable calibration optional
- Certified to CAN/CSA C22.2 No. 61010-1-12
- EAC certified

### Description

The **MX200 Vacuum Controller** controls up to 10 Televac® vacuum sensors including cold cathode, convection, diaphragm, and thermocouple sensors. The -034 version includes USB/RS-232/RS-485 with up to 8 optional set point relays. The user interface includes six touch controls and a high contrast, 180° viewing angle green OLED screen, which displays the units of measurement and the status of set points simultaneously. Multiple gas types are supported. The MX200 is a modular unit, allowing you to choose a vacuum sensing solution specific to your needs.

The -037 version of the MX200 supports EthernetIP (EIP) and is designed as a serial port replacement to interface directly with Rockwell Automation Allen-Bradley Programmable Logic Controllers (PLCs). All data and commands can be sent and received as a Class 3 acyclic request, allowing the user to set up and read data from the MX200 through the PLC at a remote location. All pressure data is available as a Class 1 cyclic output that can be transmitted at a rate settable by the user. The unit includes status LEDs that show network and module status, as well as port activity. If desired, the EIP module comes with a built-in web server that can host a password protected web page that allows the user to change network settings and access all commands from the network.

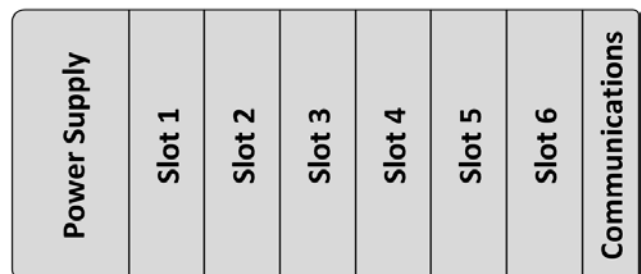
The EIP module utilizes an industry recognized HMS Anybus CompactCom device to handle the network interface. The module has been pre-certified by HMS to provide EthernetIP network conformance.

### Ordering Information

Description	Part Number
MX200 Base Unit USB/RS-232/RS-485	2-7900-034
MX200 Base Unit USB/EthernetIP	2-7900-037

Module Part Numbers	2-6200-XXX	Slots (max)
Set Point Quad Relay	-411	1 (2)
1E Dual Piezo Diaphragm	-220	1 (5)
1F Dual Piezo Diaphragm	-244	1 (5)
2A Dual Thermocouple	-486	1 (5)
4A Dual Convection	-215	1 (5)
7B Penning Magnetron Cold Cathode	-227	2 (3)
7EF DI Magnetron Cold Cathode	-285	1 (5)
Capacitance Diaphragm	-252	1 (5)



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### Electrical Connections (USB/RS-232/RS-485)

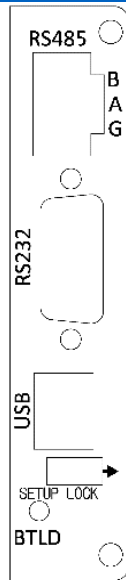
RS-232 D-Sub 9 Pin	Description
D-sub Pin 1	Ground
D-sub Pin 2	RS-232 TX
D-sub Pin 3	RS-232 RX
D-sub Pin 4	No Connection
D-sub Pin 5	Ground
D-sub Pin 6	No Connection
D-sub Pin 7	Ground
D-sub Pin 8	No Connection
D-sub Pin 9	Ground

RS-485 3 Pin	Description
3-pin Pin 1	RS-485 B (+)
3-pin Pin 2	RS-485 A (-)
3-pin Pin 3	Ground

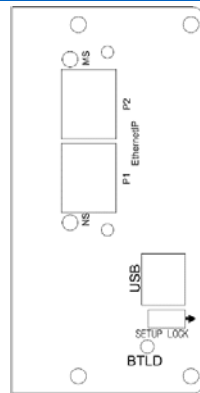
  

Other	Description
USB	USB communications
Setup Lock	Front panel lock switch
BTLD	Bootload button



### Electrical Connections (USB/EthernetIP)

P1	EthernetIP RJ45 port 1
P2	EthernetIP RJ45 port 2
NS	USB communications
MS	Module status LED
USB	USB communications
Setup Lock	Front panel lock switch
BTLD	Bootload button



### Vacuum Sensors

Description	Part Number
1E (1 to 1000 Torr) Piezo Diaphragm	2-2107-OXX
1F (10 to 10,000 Torr) Piezo Diaphragm	2-2109-OXX
2A (10 <sup>-3</sup> to 20 Torr) Thermocouple	2-2126-OXX
4A (10 <sup>-3</sup> to 1000 Torr) Convection	2-2120-OXX
7B (10 <sup>-7</sup> to 10 <sup>-3</sup> Torr) Penning CC	2-2100-2XX
7E (10 <sup>-8</sup> to 10 <sup>-2</sup> Torr) DI Magnetron CC	2-2142-OXX
7F (10 <sup>-11</sup> to 10 <sup>-2</sup> Torr) DI Magnetron CC	2-2144-052
7FC (10 <sup>-11</sup> to 10 <sup>-2</sup> Torr) DIM Cleanable CC	2-2146-052
7FCS (10 <sup>-11</sup> to 10 <sup>-2</sup> Torr) DIMC Quick Start CC	2-2146-053

### Accessories

Description	Part Number
4" (2.3U) Single-Controller Rack Kit	2-4200-57
4" (2.3U) Dual-Controller Rack Mount Kit	2-4200-61
1" Blank Module Plate	1-5300-137
Terminal Block for Set Point Relay	1-3000-39

### EthernetIP Network Interface

Connectors	(2) RJ45
Ports	10/100 Mbit, half/full duplex
DHCP	Enable or disable

### Class 1 Connections

Connection Type	Point-to-point, multicast
Target to Originator (Read) Instance ID	100
Data Size	40
Originator to Target (Write) Instance ID	150
Data Size	4
Configuration Instance	3
Supported Connections	4
Requested Packet Interval	1 to 3200 ms
Trigger Types	Cyclic, change of state
Priorities	Low, high, schedule, urgent

### Class 3 Connections

Service	0xE (get), 0x10 (set)
Class	0xA2
Instance	See ADI table
Data Value Attribute	5
Supported Connections	6
Requested Packet Interval	100 to 10000 ms
Connection Type	Point-to-point
Trigger Type	Application
Priority	Low

Please refer to the [EthernetIP manual](#) for a complete list of Class 1 and Class 3 connection details, a complete list of ADIs, and information about the Electronic Data Sheet (EDS) file.

### Cables

Sensor	10ft (3m)	20ft (6m)	35ft (11m)	50ft (15m)
1E	2-9819-010	2-9819-020	2-9819-035	2-9819-050
1F	2-9819-010	2-9819-020	2-9819-035	2-9819-050
2A	2-9800-52	2-9800-53	2-9800-55	2-9800-56
4A	2-9819-010	2-9819-020	2-9819-035	2-9819-050
7B	2-9800-09	2-9800-41	2-9800-42	2-9800-43
7E	2-9841-010	2-9841-020	2-9841-035	2-9841-050
7F	2-9841-010	2-9841-020	2-9841-035	2-9841-050
7FC	2-9841-010	2-9841-020	2-9841-035	2-9841-050
7FCS	2-9841-010	2-9841-020	2-9841-035	2-9841-050
7FCS QS	2-9837-010	2-9837-020	2-9837-035	2-9837-050

### Other

USB	1-2400-005	1.8 m (6.0 ft)
ETH	1-2400-006	1.5 m (5.0 ft)

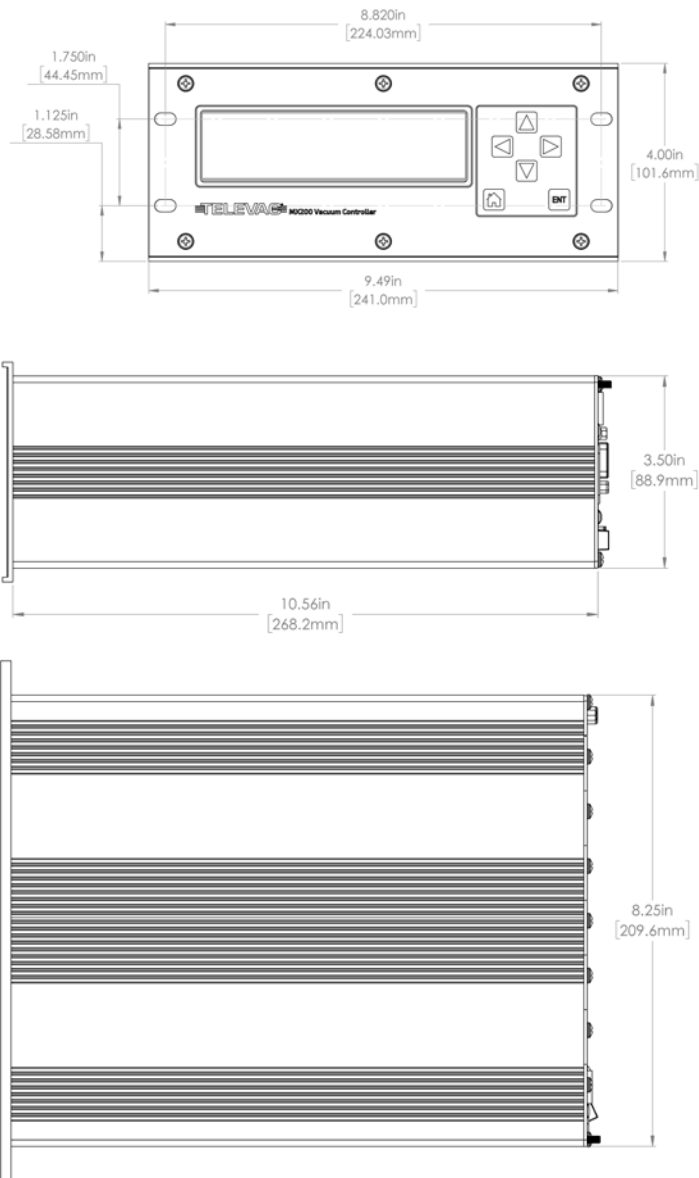
Note that we also offer radiation resistant and high temperature cables. Custom lengths can also be specified.

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### Dimensional Drawings



### Additional Documentation

- Televac® Tolerances
- AN 3008 - MX200 to PC Interfacing and Communications
- AN 3016 - MX200 EthernetIP Loading EDS Files for Rockwell Automation Allen-Bradley CompactLogix PLCS
- AN 3017 - MX200 EthernetIP Setup and Troubleshooting Guide for EthernetIP Option 1
- AN 3018 - MX200 EthernetIP Setup and Troubleshooting Guide for EthernetIP Option 2

### Company Information

#### Specialty manufacturing services that promise precision –

For more than 85 years, Fredericks has specialized exclusively in tilt and vacuum measurement products. Today, our precise manufacturing processes produce the most accurate and advanced products on the market, ensuring perfection every time. A true specialty service provider, we are willing and eager to put our experience and capabilities to good use, helping OEMs achieve even the most complex designs.

#### High performance products designed and manufactured with pride -

Fredericks is a global provider and U.S. manufacturer and designer of high-performance tilt and vacuum measurement products. Built to last, our products are made with state-of-the-art sensing technology, proven processes, and an intrinsic passion for the trade. Offering simple integration and quality and safety benchmarks, our customers benefit not just from standard-setting reliability, but from our commitment to competitive pricing and performance.

#### A partnership that prioritizes uptime, lead time, and service -

Fredericks guarantees customer satisfaction and our 'not too big, not too small' operation is what enables us to offer a true partnership experience. Our dedicated representatives and engineers offer exceptionally responsive service and some of the fastest lead times in the industry, knowing that uptime is the key to your success. With anytime-access to our leadership team and solutions that enhance your products, you will feel the Fredericks difference.

#### Vacuum measurement tools built for the toughest jobs -

Fredericks' world-class vacuum sensors, gauges, and control instrumentation are engineered for the most demanding applications and environments. Our patented Televac® and ETI vacuum brands feature cold-cathode technology, thermocouple and convection gauges, and precision-manufactured hot ionization gauges. Dedicated solely to vacuum gauging and calibration services, we provide industrial heating, national laboratories, cryogenics, and industrial gas applications, among many others, with fast lead times and industry-leading performance. Covering the entire practical vacuum range, our products deliver rapid response vacuum readings and superior sensitivity.

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