

MX200 Vacuum Controller

Part Number: 2-7900-03X



Operating Specifications

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

Physical Characteristics

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

Key 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

Certifications, Compliance, and Ratings

- Certified to UL 61010-1
- CE certified to EN61326-1:2006
- Certified to CAN/CSA C22.2 No. 61010-1-12
- EAC certified
- ISO 17025 accredited calibration optional
- NIST traceable calibration optional

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.

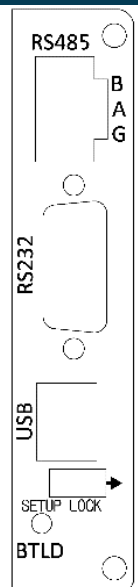
The EIP module utilizes an industry recognized HMS Anybus CompactCom device to handle the network interface. The module has been pre-certified by HMS to provide EthernetIP network conformance.

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

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



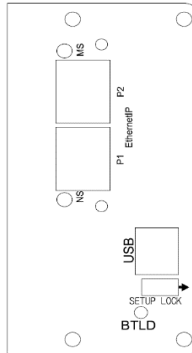
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Electrical Connections (EthernetIP/USB)

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



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 Instance ID	100
Data Size	40
Originator to Target 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

Set Point Information

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.

Ordering Information

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

MX200 Vacuum Controller Modules	Slots (max)
2-6200-411	Set Point Quad Relay 1 (2)
2-6200-220	1E Dual Piezo Diaphragm 1 (5)
2-6200-244	1F Dual Piezo Diaphragm 1 (5)
2-6200-486	2A Dual Thermocouple 1 (5)
2-6200-415	4A Dual Convection 1 (5)
2-6200-227	7B Cold Cathode 2 (3)
2-6200-285	7E, 7F, 7FC, 7FCS Cold Cathode 1 (5)
2-6200-451	Capacitance Diaphragm (24 V DC) 1 (5)
2-6200-452	Capacitance Diaphragm (15 V DC) 1 (5)

Power Supply	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Communications
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Compatible Vacuum Gauges

Part Number	Description
2-2107-0XX	1E (1 to 1000 Torr) Piezo Diaphragm
2-2109-0XX	1F (10 to 10,000 Torr) Piezo Diaphragm
2-2126-0XX	2A (10 ⁻³ to 20 Torr) Thermocouple
2-2120-0XX	4A (10 ⁻³ to 1000 Torr) Convection
2-2100-2XX	7B (10 ⁻⁷ to 10 ⁻³ Torr) Penning CC
2-2142-0XX	7E (10 ⁻⁸ to 10 ⁻² Torr) DI Magnetron CC
2-2144-052	7F (10 ⁻¹¹ to 10 ⁻² Torr) DI Magnetron CC
2-2146-052	7FC (10 ⁻¹¹ to 10 ⁻² Torr) DIM Cleanable CC
2-2146-053	7FCS (10 ⁻¹¹ to 10 ⁻² Torr) DIMC Quick Start CC

Compatible 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

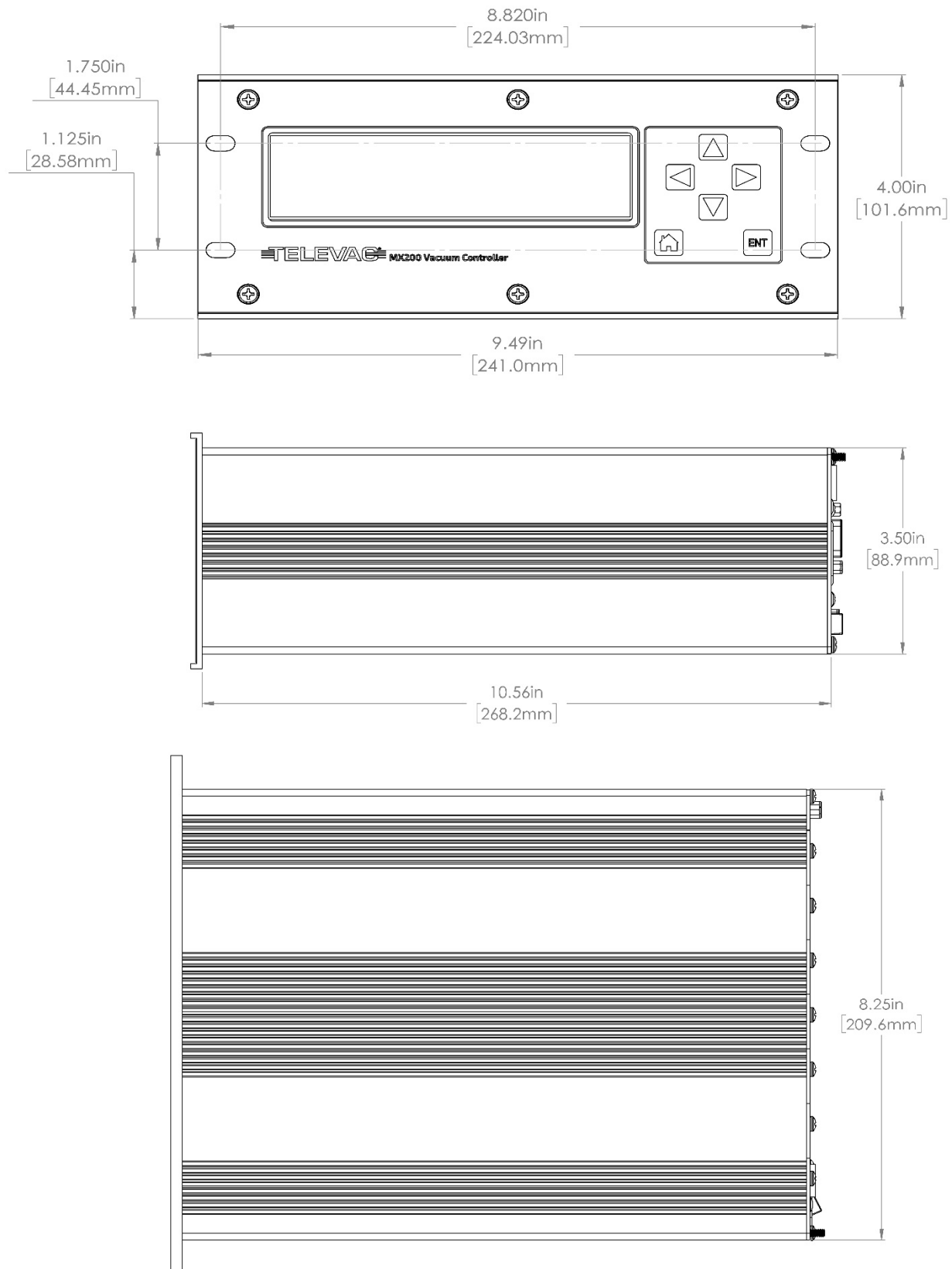
USB	1-2400-005	1.8 m (6.0 ft)
ETH	1-2400-006	1.5 m (5.0 ft)

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

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Dimensional Drawings



MX200 Vacuum Controller

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Additional Documentation

Manual	MX200 Instruction Manual
Manual	MX200 EthernetIP Instruction Manual
EDS File	MX200 EthernetIP EDS File
AN3008	MX200 to PC Interfacing and Communications
AN3010	Torr Scientific/Torr Decimal/mTorr/Micron Conversions
AN3015	Recommended Practices for Vacuum Calibration
AN3016	MX200 EthernetIP Loading EDS Files for Rockwell Automation Allen-Bradley CompactLogix PLCs
AN3017	MX200 EthernetIP Setup and Troubleshooting Guide
AN3020	Vacuum Terminology Reference
AN3029	Creating and Mapping Class 3 Connections for Rockwell Automation Allen-Bradley CompactLogix PLCs
Article	Case Study: Argonne National Laboratory
Resource	Televac® Tolerances

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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