



ASSET MONITORING PRODUCTS



PMX1500 Series Monitoring System
4 Sensor Inputs
Product Manual

TABLE OF CONTENTS

- Introduction.....3
- Product Description.....3
- Product Dimensions and Diagram4
- Mounting Instructions.....5
- Conduit Entry6
- Grounding7
- Electrical Connections9
- Configuring Relays 13
- Troubleshooting..... 14
- Warranty and Return Information 14



INTRODUCTION

CTC offers Relay and Display solutions that provide a visual display of the machinery vibration values, while also allowing a customer-defined input level to trigger a relay and external shut down protocols.

PMX1500

The PMX1500 Series system monitors a machine's condition based on its level of vibration. The system can be integrated into a circuit to shut down a machine when preset vibration levels are reached. The system detects high vibration energy sensed via the input accelerometers and actuates relays based on alert and alarm set points. The system will indicate the instantaneous vibration levels and relay status at each channel through the display meters.

The PMX1500 Series system is contained within a standard fiberglass enclosure. Mounting brackets are provided for wall-mounting the enclosure (wall anchoring screws are not included).

Rated for NEMA 4X (IP65), the PMX1500 Series can withstand harsh environments including temperatures ranging from -58 °F to 180 °F (-50 °C to 82 °C). The box is also resistant to hose-directed fluid and corrosion. Snap latches are installed on the door, allowing the box to be sealed from the elements when not in use.



PRODUCT DIMENSIONS

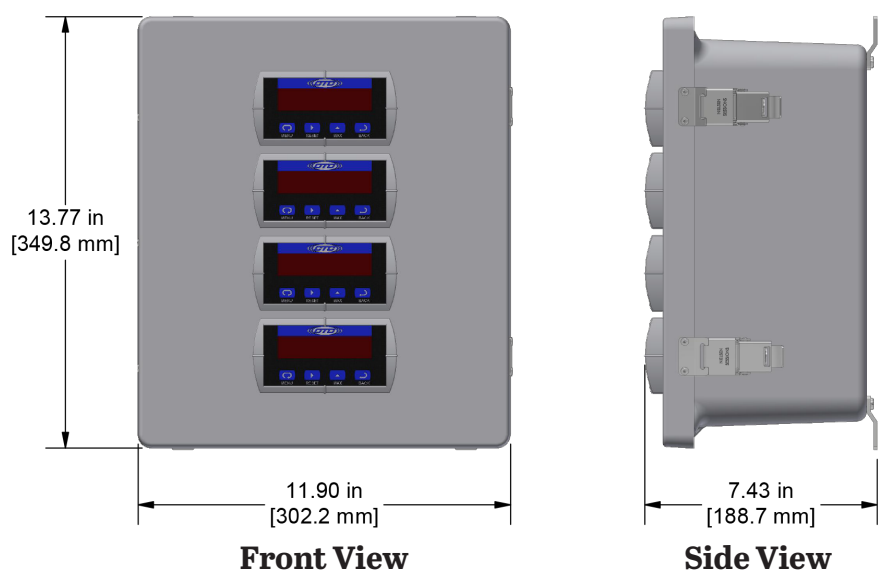


Figure 1. Dimensions

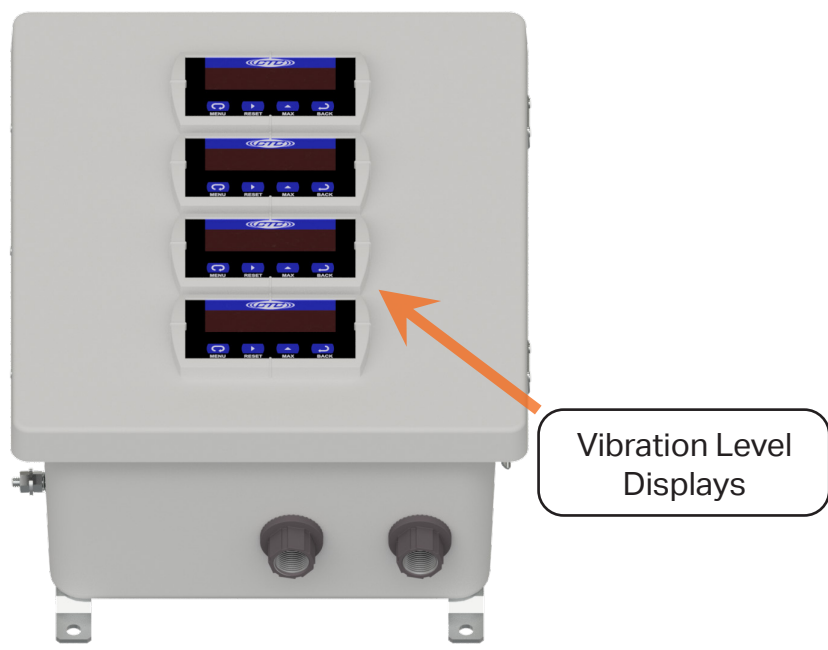


Figure 2. Diagram

MOUNTING INSTRUCTIONS

Independent stainless steel mounting feet are included on the enclosure. Wall anchoring screws are not included. **Note:** If you have purchased a PMX1500 series enclosure without cable entries provided, you should add your own entry prior to mounting the enclosure. CTC does not recommend putting holes in the top of the enclosure due to access and moisture concerns.

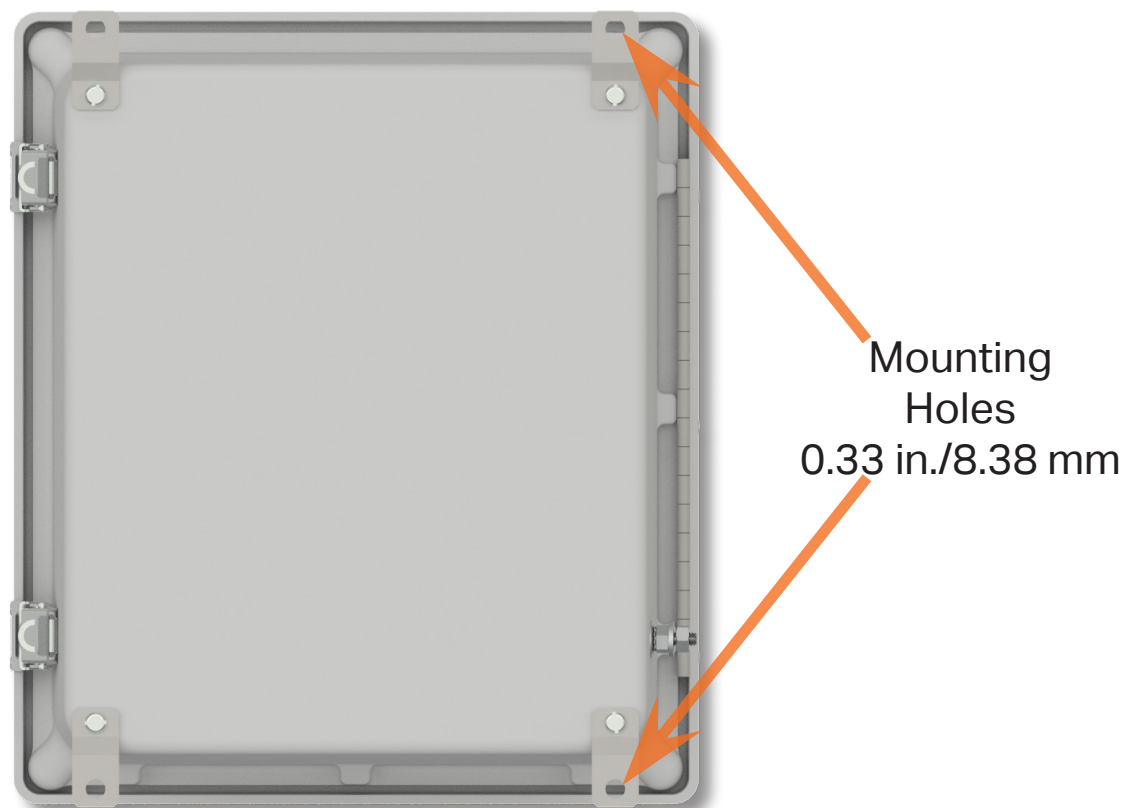


Figure 3. PMX1500 Series Rear View

CONDUIT ENTRY

If you are running conduit to your enclosure, ensure the conduit cable entry enters from the bottom of the enclosure when mounted.

Note: To ensure moisture will not flow into the enclosure, a hole should be drilled at the lowest point in the conduit to provide drainage for any moisture.

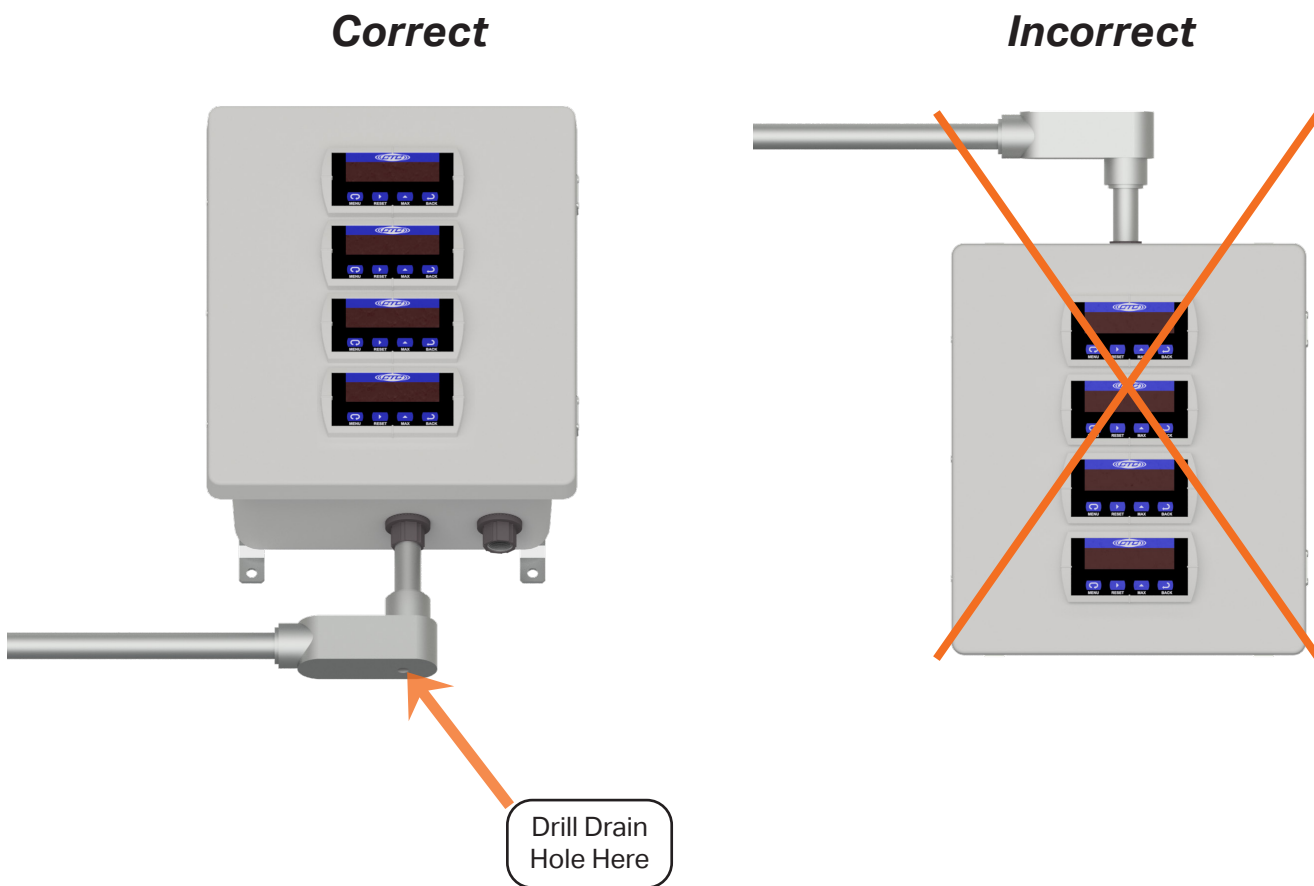


Figure 4. Conduit Entry for PMX1500

GROUNDING

Ensure the shield ground wire on the PMX1500 Series enclosure is grounded to earth ground.

A. Mounting to Earth Ground

When mounting PMX1500 Series enclosures to earth ground (such as an I-Beam), mount the shield ground wire using a mounting bolt through one of the mounting brackets on the enclosure.



Figure 5. Proper Shield Grounding Technique

B. Mounting to Non-Grounded Structure

When mounting the PMX1500 enclosure to a non-grounded structure, ensure the shield ground wire or customer-supplied ground wire is tied to a source of earth ground.

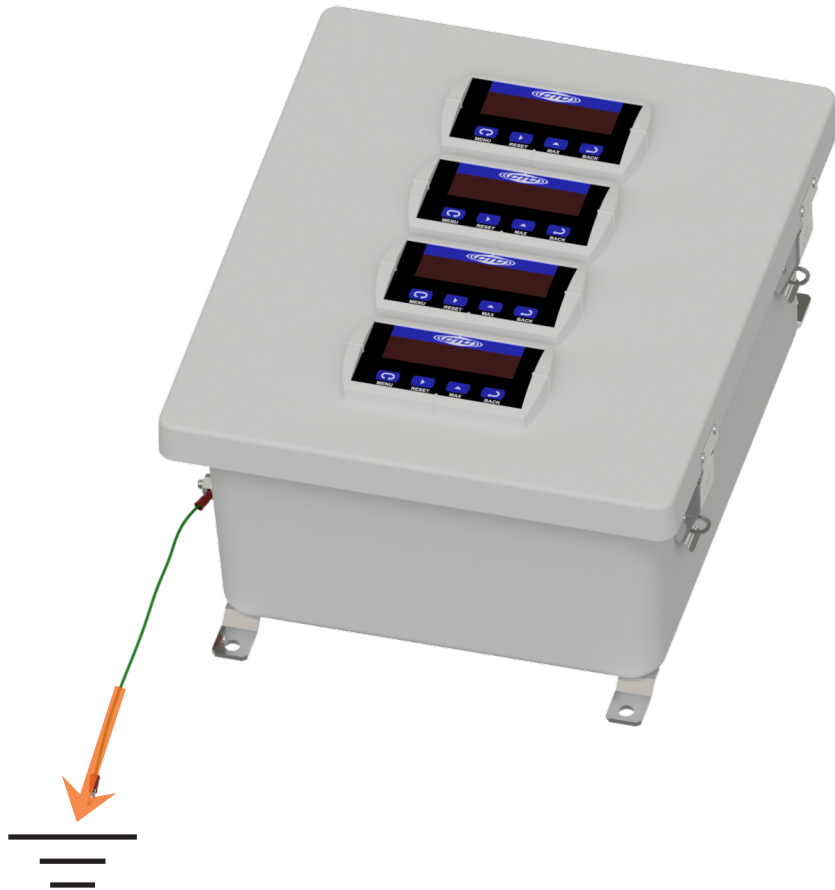


Figure 6. Ground Wire Placement

ELECTRICAL CONNECTIONS

Cables enter and exit the enclosure through conduit fittings or cord grips on the bottom of the unit. All input and output wiring is connected to the terminal blocks inside the unit. Inputs are routed through a 1.5 in. conduit fitting or cord grips (1 per channel), output wiring is routed through a 1.5 in. conduit fitting. 110 V_{AC} is needed to power the unit through the terminal on the right side of the enclosure. If input options are selected when ordering, a 0.5 in. conduit fitting is provided for AC power entry.

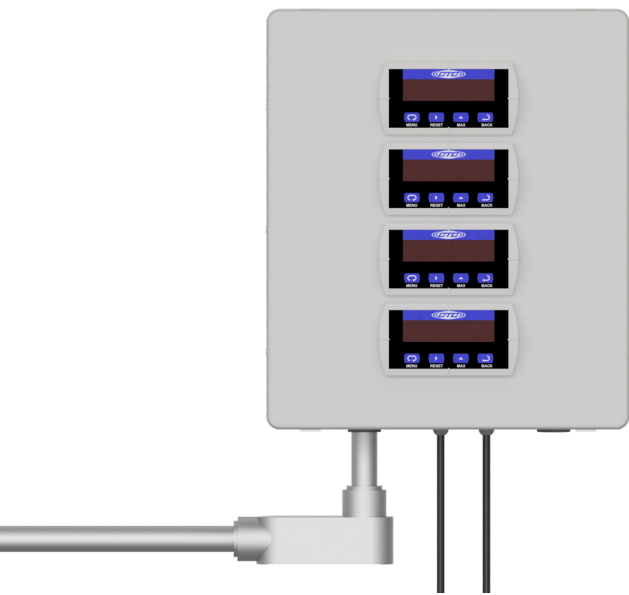


Figure 7. Front View

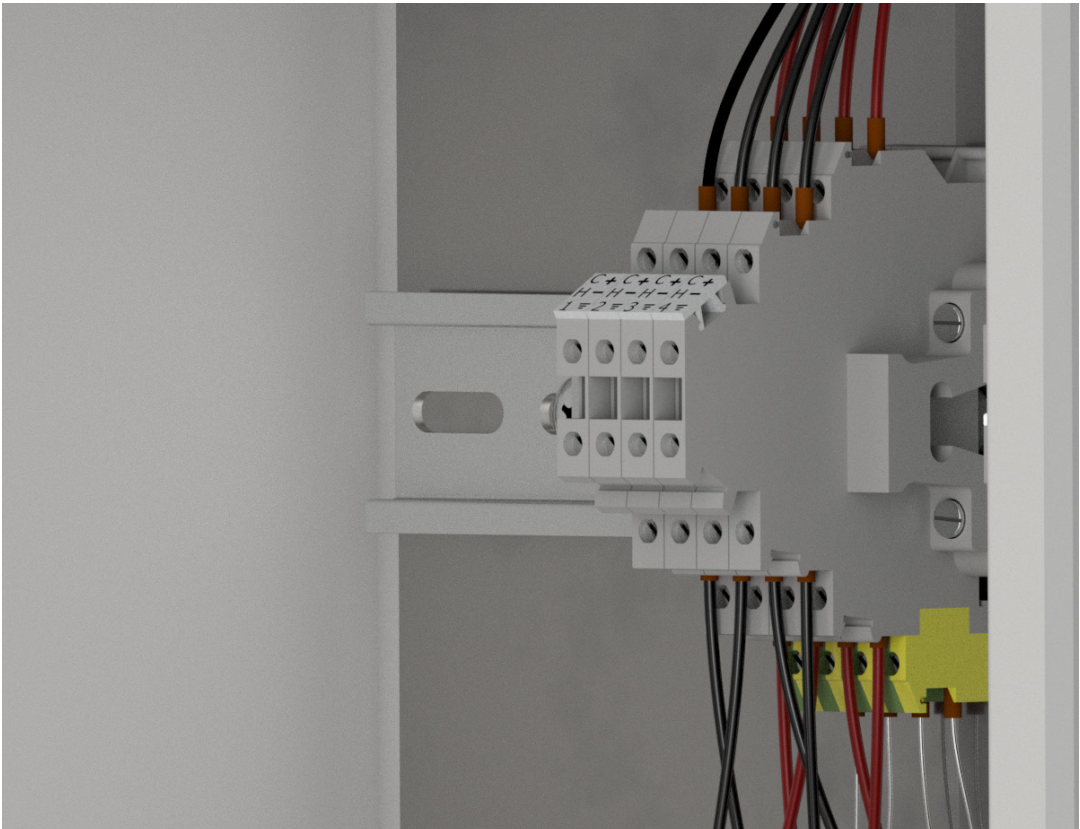


Figure 8. Bottom View

Wiring Inputs and Outputs

When purchasing a PMX1500 Series enclosure, CTC will wire the displays to the internal terminal blocks prior to shipment. Use the following pages to determine the correct way to wire sensors into the system.

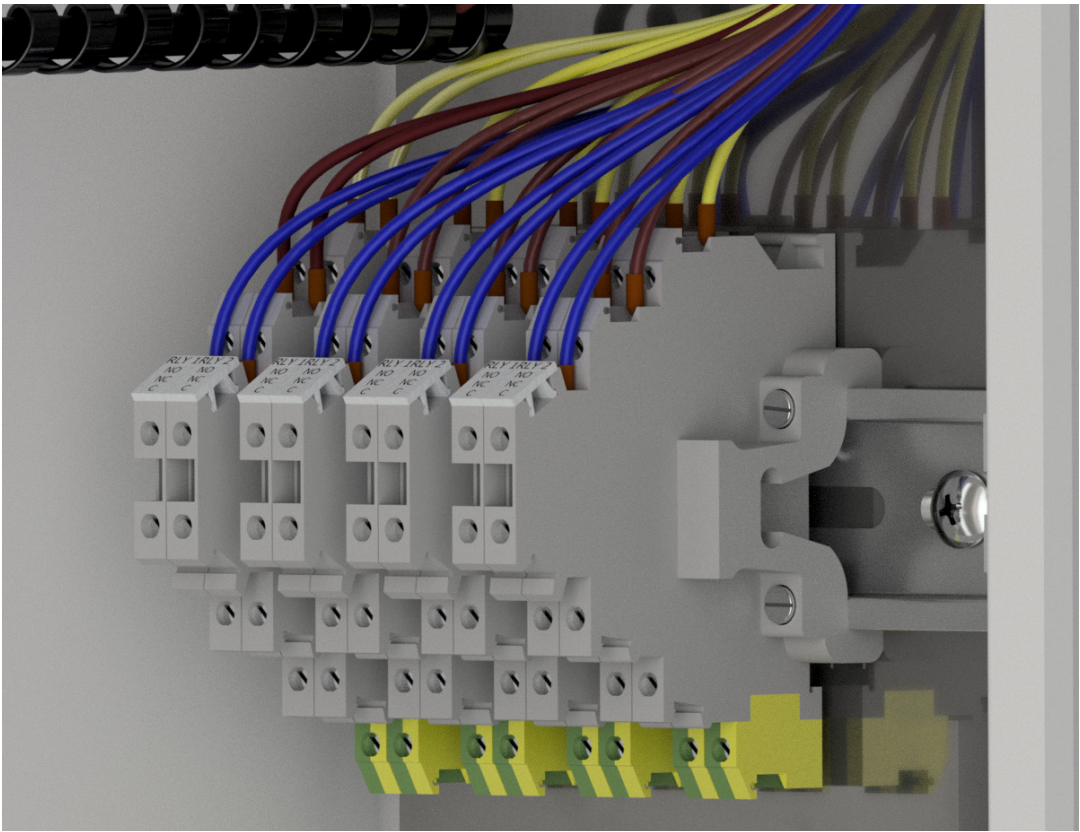
Wiring Inputs



Wiring Inputs

Terminal Block Position	Display Terminal Block Position	Cable Color	Destination
-	mA+	Black	Power In (-)
+	P+	Red	Power In (+)
N/A	P-/COM	Black	Power In (-)
Green/Yellow Terminal	N/A	Unshielded	Ground

Wiring Outputs

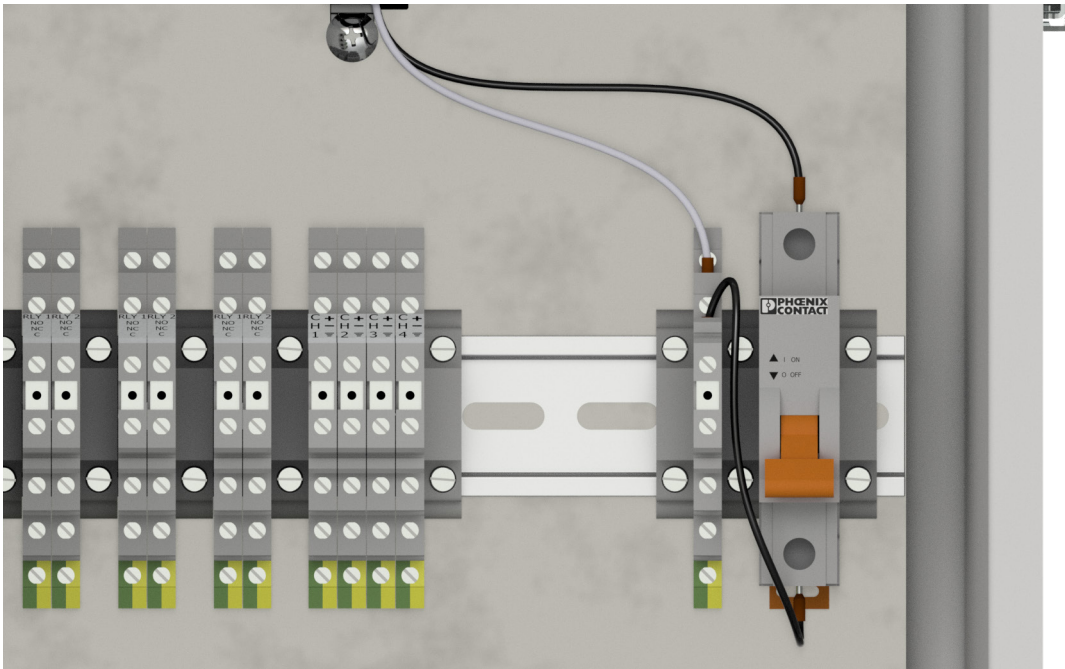


Wiring Outputs

Terminal Block Position	Display Terminal Block Position	Cable Color	Destination
Top	C	Blue	Common Out
Middle	NC	Brown	Normal Closed
Bottom	NO	Yellow	Normal Open

Wiring Power

In order to safely supply power to the relays, the PMX1500 features a circuit breaker. Below is the wiring configuration to bring live power into the enclosure.



Wire	Wire Color	Terminal Position
Ground	Green	Top
Neutral Power	White	Middle
Live Power	Black	Yellow/Green

Wiring for the Warning Light and Horn

Stack Lights with optional horn functionality come factory wired and no additional field installation is required.

CONFIGURING RELAYS

The input to the internal controller comes from the sensor or vibration transmitter. They are built with a specific full-scale range and frequency band. The full-scale range of the transmitters must be known for the controllers to display the correct vibration value. The transmitter will not display any vibration energy present at frequencies outside the filtering range. Refer to the user manual for your specific sensor or vibration transmitter for instructions on operation.

Example: Full Scale 0.00 – 1.00 IPS, Frequency Band 10 – 1000 Hz

At 0.00 IPS, 4 mA flows from the transmitter to the controller. At 0.50 IPS, 12 mA flows from the transmitter to the controller. At 1.00 IPS, 20 mA flows from the transmitter to the controller.

The monitoring channel provides two relay outputs. The system comes from the factory with a specific vibration range in IPS or mm/s. This range must be known to configure the relay set points. It is recommended that baseline and typical alarm values of vibration are also known before setup is attempted. The relays provided by the internal controller are highly configurable. Refer to the PD765 user manual for detailed programming instructions.

All of the following parameters can be adjusted:

- Relay Action – Automatic, Latching, Auto + Manual Reset, Latch with Clear
- Relay Operation – Set and Reset points (Hysteresis), On and Off time Delays

Example Setup 1:

A full-scale range of 0.00 – 1.00 IPS has been specified. The baseline vibration on the machine to be monitored is 0.18 IPS-pk. Alarm and shutdown levels of vibration are defined as 0.35 IPS-pk and 0.65 IPS-pk, respectively. Reset points are specified as 0.30 IPS-pk and 0.60 IPS-pk. Using the provided PD765 Process Controller manual, select the relay operation and action desired. For this example, we will have LOC, Latching Operation with Clear relays. Then program "Set 1" as 0.35 and "Set 2" as 0.65, then program reset points, "rST 1" as 0.30 and "rST 2" as 0.60. After relays have been programmed, scaling must be set. For this example, we will use a 4 - 20 mA input with a 0.00 - 1.00 IPS display. Program "inP1" as 4.00, then "diS1" as 0.00, then "inP2" as 20.00, then "diS2" as 1.00. This will create an input of 4 mA, display of 0.00 IPS, and at an input of 20 mA, 1.00 IPS will be displayed by the meter. The system will now actuate the LOC Relay (Relay 1) when the vibration level reaches 0.35 IPS-pk and another



LOC Relay (Relay 2) when the vibration level reaches 0.65 IPS-pk. To reset the LOC relays, the vibration level must fall below the reset point of 0.60, then press the ACK for relay two. Once the vibration level falls below 0.30, press the ACK to reset Relay 1.

TROUBLESHOOTING

If there is no sensor wired to the sensor input terminal, the corresponding transmitter for that channel will not power on. This will cause the Output Display to read low or negative values. Be sure to power the system on AFTER the sensor has been connected.

If the display fails to output a value after power has been turned on and the sensor has been wired, turn off the unit, wait several seconds, and reapply power. The internal electronics require some time to ramp up and settle before they are fully operational.

WARRANTY & REFUND

Please visit www.ctconline.com to view a complete recapitulation of our warranty and refund policies.

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