PROTECTION & RELIABILITY
OPTIMIZATION INSTRUMENTS
A CTC COMPANY

Product Manual

MNX10036 / REV A

MODEL MVR1000 Series

Mini-ViPR Multi Channel Monitoring System

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Section I
Overview

Introduction

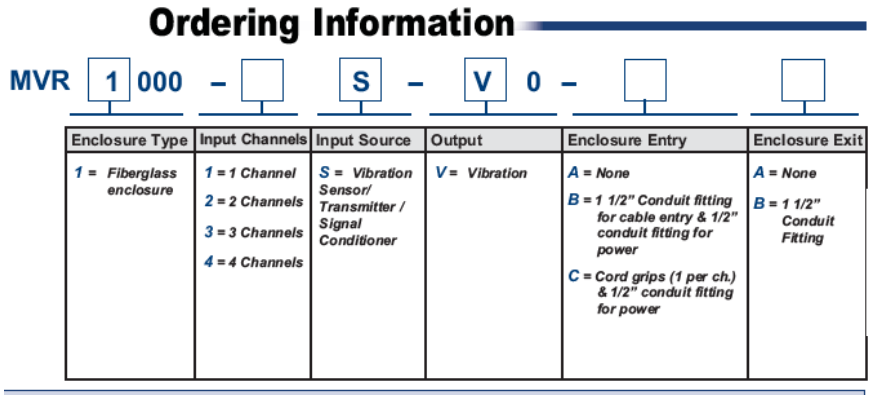
This document contains information on the operation, installation and maintenance of the PRO MVR1000 Series Multi Channel Monitoring System. This manual is an overview of the system and references the specific component manuals. User manuals are provided with the system for all configurable internal components.

Description

The PRO MVR1000 Series system monitors a machine's condition based on its level of vibration. The system can be integrated into a circuit to shutdown a machine when preset vibration levels are reached. The system detects high vibration energy being sensed by 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 system supplies outputs for Dynamic Vibration data (Waveforms) transmitted by the accelerometers. The waveforms are obtained from the BNC jacks located on the front of the enclosure, or can be wired from screw terminals identified by "Sensor Output".

Mini-ViPR Model Selection

The MVR1000 Series System has numerous options available to customize the Mini-ViPR System to specific needs. Below is a guide to help select which MVR1000 Series system fits your specific requirements. (Figure 1)



Example Part Number: MVR1000-3S-V0-CB

Figure 1- MVR Series Selection Guide

Section II
Installation

Mounting

The MVR1000 Series system is contained within a standard fiberglass enclosure, NEMA 4X Rated. Mounting brackets are provided for wall-mounting the enclosure. (Wall anchoring screws are not included).

Note: If you have purchased a MVR1000 Series System without cable entries provided, you should add your own entry prior to mounting the enclosure.

Note: CTC does not recommend putting holes in the top of the enclosure due to access and moisture concerns.

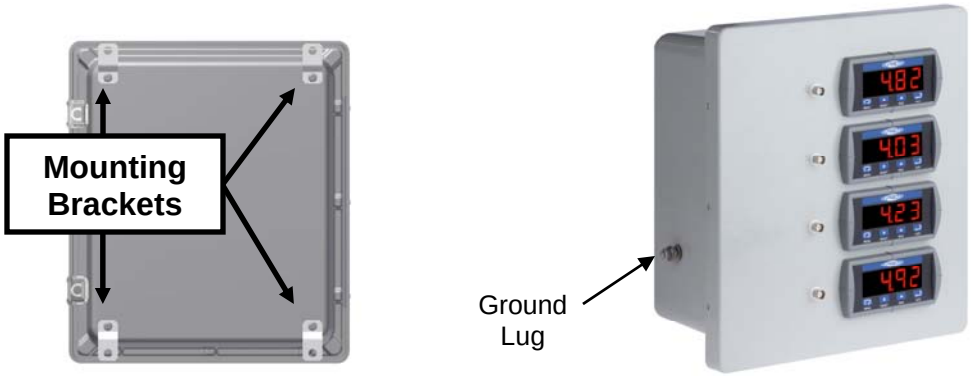


Figure 2 – Mounting & Grounding

Ensure the shield ground wire on the MVR1000 Series System is connected to earth ground.

Note: The customer is required to supply the form of connection between the ground to shield ground lug, located on the outside of the enclosure.

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.

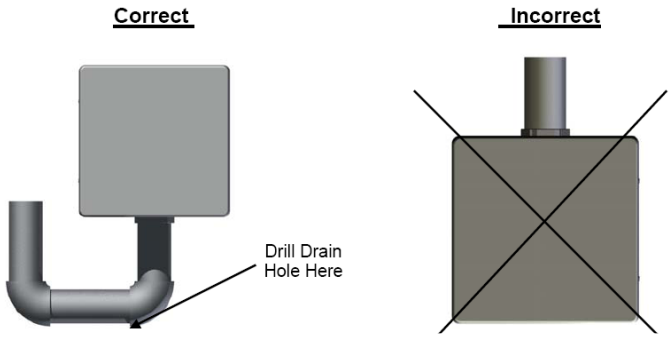


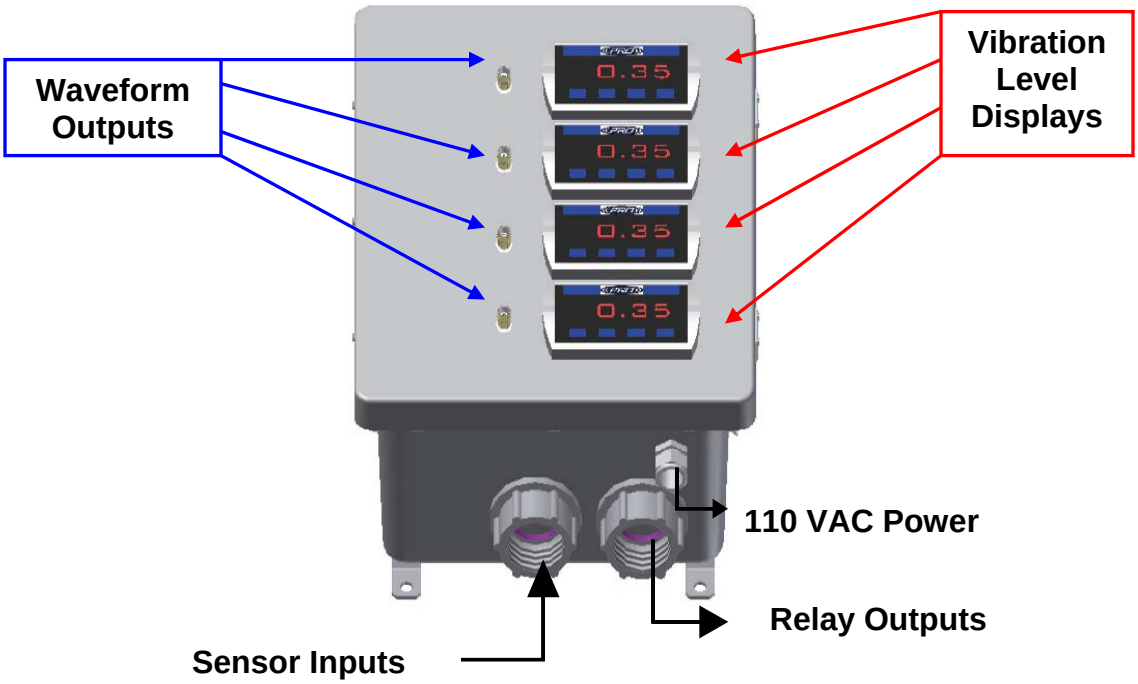
Figure 3 – Conduit Entry

Cables enter and exit the enclosure through conduit fittings and/or cord grips on the bottom of the unit. All input and output wiring is connected to the terminal blocks and signal conditioners inside the unit. All inputs routed through a 1.5" Conduit Fitting or cord grips (1 per ch.). Output wiring is routed through a 1.5" conduit fitting. 110 VAC is needed to power the unit through the terminal on the right side of the enclosure. A ½" Conduit Fitting is provided for AC power entry. (Figure 2)

NOTE: 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.

NOTE: 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 then reapply power. The internal electronics require some time to ramp up and settle before they are fully operational.

Figure 4 - Cable Entry/Exit & Power



Electrical Connections

1. Wire Sensor into terminals 13 & 14 as shown. *Refer to PRO Signal Conditioner User Manual for specific instructions on wiring.*

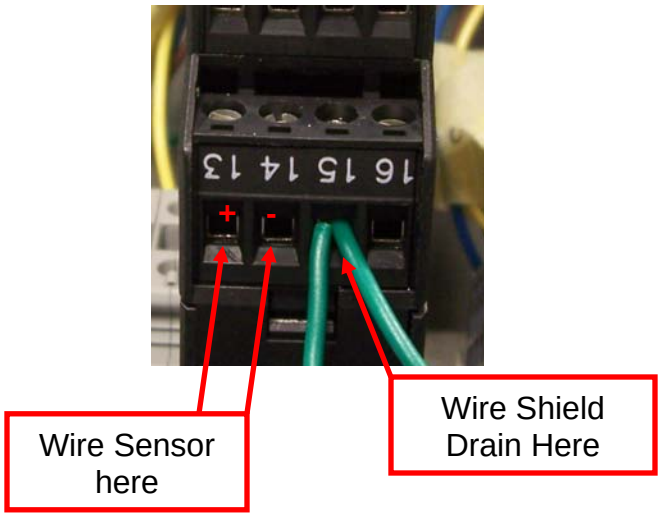


Figure 5 – Input Wiring

2. Wire relay output as shown.

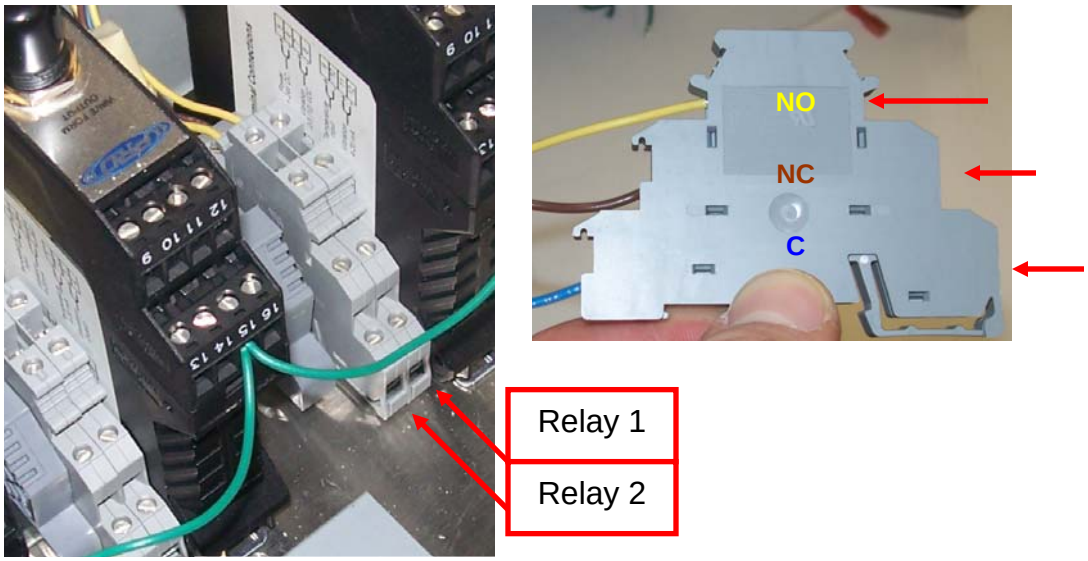


Figure 6 – Relay Wiring

Section III
Operation

Configuring Relays

The input to the internal controller comes from the vibration transmitter. They are built with a specific full scale range and frequency band. The Full scale range of the transmitters must be known in order 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 PRO Signal Conditioner User Manual for specific instructions on calibration and operation.*

Example → Full Scale 0 – 1.0 IPS , Frequency Band 10 – 1000 Hz.
At 0 IPS, 0.00 Volts flows from the transmitter to the controller
At 0.50 IPS, 2.5 volts flows from the transmitter to the controller.
At 1.0 IPS, 5.0 Volts flows from the transmitter to the controller.

The monitoring channel provides 2 relay outputs. The system comes from the factory with a specific vibration range in IPS or mm/s. To configure the relay set points, this range must be known. 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 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 – 1 IPS has been specified. Baseline Vibration on the machine to be monitored is 0.18 IPS-pk. Alarm and Shutdown levels of vibration are specified 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 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 0-5 Volt input with a 0-1 IPS display. Program "inP1" as 0.00, then "diS1" as 0.00, then "inP2" as 5.00, then "diS2" as 1.00. This will let us have an input of 0.00 Volts, display of 0.00 IPS and at an input of 5 Volts, 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. In order to reset the LOC relays, the vibration level must fall below the reset point of 0.60, then press the ACK for relay 2 and once the vibration level falls below 0.30, press the ACK to reset relay 1.

Analog Output

The analog 4-20mA signal represents the amount of vibration energy present at each channel based on the internal transmitter's full scale. I.E. a 12 mA signal from a 0 → 2.0 IPS transmitter represents a vibration level of 1.0 IPS.

To obtain the analog 4-20mA output, manual adjustment of the internal transmitters may be needed upon installation. *Refer to PRO Signal Conditioner user manual for specific instructions.*

Note: CTC does not provide the wiring to obtain the 4-20mA signal.

Section IV
Maintenance

Once the system has been calibrated and installed it requires minimal maintenance. Basic checks to ensure system integrity should be made periodically.

Visual Inspections should include examinations for the following:

- The displays are operational
- No visible electrical burns or smoke inside the enclosure
- Enclosure hinges are free from rust and securely latched
- No moisture or condensation build up inside the enclosure

General

There are no customer replaceable parts. It should provide trouble-free continuous service under normal operating conditions.

Warranty

If any PRO product should ever fail, we will repair or replace it at no charge, as long as the product was not subjected to misuse, natural disasters, improper installation or modification which caused the defect.

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