DTM20 Seismic Vibration Distributed Transmitter Monitor

(Acceleration, Velocity and Displacement)

The DTM20 distributed vibration transmitter monitor provides a simple and cost-effective solution for monitoring critical and balance of plant equipment. The DTM's smart design is extremely reliable with redundancy in power supply inputs, 4-20mA outputs and relay outputs, as well as, a modbus communication port. The DTM interfaces with almost any vibration sensor (accelerometer or velocity transducer). The DTM is fully digital and may be configured in the field or come pre-configured from the factory.

Applications Include

- ✓ **Motors**
- ✓ **Pumps**
- ✓ **Fans**
- ✓ **Blowers**
- ✓ **Engines**
- ✓ **Compressors**
- ✓ **Centrifuges**
- ✓ **Generators**
- ✓ **Turbines**
- ✓ **Turbochargers**

DTM20 Fully Configurable by Software

- ✓ **Acceleration**
- ✓ **Velocity**
- ✓ **Displacement**

DTM20 Features

- ✓ **Measures acceleration, velocity or displacement**
- ✓ **Direct Modbus RTU interface**
- ✓ **Redundant 4-20mA outputs (pk or RMS)**
- ✓ **Redundant power supply inputs**
- ✓ **Fully digital field-configurable or factory pre-configured**
- ✓ **Dual relay outputs with Alert and Danger (SPDT)**
- ✓ **LED indication of system OK, Alert and Danger**
- ✓ **Local and remote RESET/BYPASS and trip-multiply**
- ✓ **Buffered output for condition monitoring**
- ✓ **Aluminum case (copper free) for RFI/EMI protection**

Specifications

Electrical

Power Supply:

  22-30VDC, 150mA

  Galvanic isolation: power to circuits

  Accepts dual power supplies

Frequency Response ($\pm$3dB):

  Nominal Frequency:

    Acceleration: 2 - 2 KHz.

    Velocity: 2 - 2 KHz

    Displacement: 4 - 2 KHz

  Low Frequency:

    Acceleration: 0.5 - 100Hz

    Velocity: 0.5 - 100Hz (TM079VD)

    Displacement: 0.5 - 100Hz (TM079VD)

ICP Sensor Interface:

  Sensitivity:

    100mV/g for TM0782A

    4.0mV/mm/sec (100mV/in/sec) for TM0793V

    4mV/um for TM079VD

    Sensitivity of any vibration sensor can be specified

  Current Source

    Nominal 4mA@24VDC

Seismic Velocity Sensor Interface:

  Sensitivity:

    User specifies for any vibration sensor

    Software programmable

    (This type of seismic velocity sensor does not require external power)

Buffered Output:

  Original, un-filtered signal

  Impedance: 550 Ω

  Maximum cable distance: 300m (1,000ft)

  Sensitivity: same as the sensor

  Local BNC connection
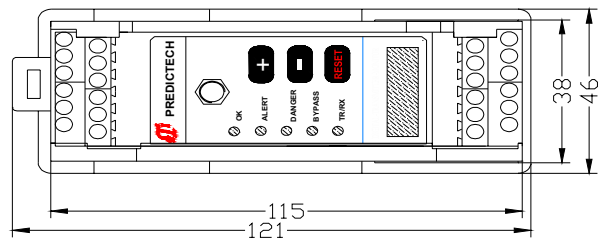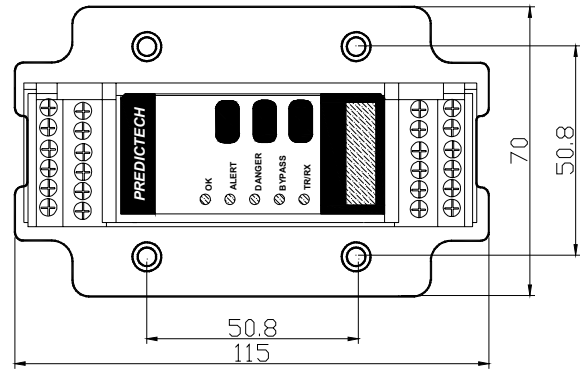
  Remote terminal connection

Overall Vibration:

  Dual 4-20mA, source

  Maximum load resistance 500 Ω

Alarm Setup:

  0 - 100% FS

  Accuracy: $\pm$0.1%

Relays:

  Seal: Epoxy

  Capacity: 0.2A/240VAC, 0.4A/110VAC or 2.0A/24VDC, resistive load

  Relay type: SPTD

  Isolation: 1,000VDC

LED Machine Condition Indicator:

  OK: System OK indication

  ALT: Vibration over Alert level

  DNG: Vibration over Danger level

  BYP: System in bypass

  TRX: Digital transmitting

RESET/BYPASS:

  Local reset: On monitor front panel

  Remote RESET/BYPASS: Shorting the connector pin RESET and COM will engage system reset and bypass

Trip-Multiply

  Shorting the connector pin Trip-Multiply and COM will engage system alarm level increases to factor pre-setting

Modbus:

  Modbus RTU. With RS485 not isolated from the system, isolation can be done with the DTM96

Physical

Dimensions: Height: 75mm (2.95")

             Weight: 2.0lbs (1.0kg)

Environmental

Temperature:
    Operation: -40°C to +85°C
    Storage: -50°C to +100°C
Humidity:
    90% non-condensing
Case:
    Aluminum casted (copper free) case

Certifications

CE certified with EMI compliance
CSA Class I, Div. 2, Groups A, B, C & D, T4
ATEX lll 3G Ex nA ll T4

Order Information

* Factory default

DTM20-AX-BX-SX

Customer fully-configurable seismic vibration DTM (requires DTM-CFG Software)

AX: Alarms and Sensor
    A0: Dual epoxy sealed relay alarms, current mode
        sensor
    A1: No alarm, current mode sensor
    A2: Dual epoxy sealed relay alarms, seismic velocity
    A3: No alarm, seismic velocity

BX: Mounting
    B0: DIN rail mount
    B1: Plate mount

SX: Approvals
    S0*: CE
    S1: CE
        CSA Class I, Div.2, Groups A, B, C & D, T4
        ATEX lll 3G Ex nA ll T4

DTM20-101-AXX-CX-GX-HX-IX-SX

Factory pre-configured seismic vibration DTM

AXX: Full Scale
    A00: 0 - 200um (8mil) pk-pk
    A01: 0 - 500um (20mil) pk-pk
    A02: 0 - 100um (4mil) pk-pk
    A03: 0 - 250um (10mil) pk-pk
    A05: 0 - 125um (5mil) pk-pk
    A06*: 0 - 50mm/s (2.0 ips) pk
    A07: 0 - 100mm/s (4.0 ips) pk
    A08: 0 - 20mm/s (0.8 ips) pk
    A11: 0 - 25mm/s (1.0 ips) pk
    A12: 0 - 5.0g pk
    A13: 0 - 10g pk
    A26: 0 - 50mm/s (2.0 ips) rms
    A27: 0 - 100mm/s (4.0 ips) rms
    A28: 0 - 20mm/s (0.8 ips) rms
    A31: 0 - 25 mm/s (1.0 ips) rms

CX: Alarms
    C0*: Dual alarms with epoxy sealed relays
    C1: No Alarm

GX: Mounting
    G0*: DIN rail mount
    G1: Plate mount

HX: Sensors (not included)
    H0*: TM0782A or any current mode accelerometer with
        100mV/g (A00-A05 not available)
    H1: TM0793V or any current mode velocity sensor with
        4mV/mm/s (A12, 13 not applicable)
    H2: TM079VD (A12, 13 not available)
    HXXX: Seismic velocity sensor, Sensitivity = XXX
        mV/in/sec (A12, 13 not available)

IX: Frequency Response
    I0*: Normal frequency (H2 not available)
    I1: Low frequency (0.5-100Hz)

SX: Approvals
    S0*: CE
    S1: CE
        CSA Class I, Div.2, Groups A, B, C & D, T4
        ATEX lll 3G Ex nA ll T4

Optional Accessories

DTM-CAL

The DTM field calibration kit is capable of calibrating any 5mm, 8mm and 11mm probe system. The kit includes:

- ✓ DTM-CFG configuration and calibration software CD
- ✓ RS485-USB converter with cable
- ✓ TM0540 proximity probe field calibration kit

DTM-CFG-K

DTM configuration and calibration software kit includes:

- ✓ DTM-CFG configuration and calibration software CD
- ✓ RS485-USB converter with cable

TM900

Power converter with isolation. It converts 95-250 VAC into 24VDC and has the capability to power up to five DTM modules.

Sensors

TM0782A-K: Accelerometer kit
TM0783A: Accelerometer with cable
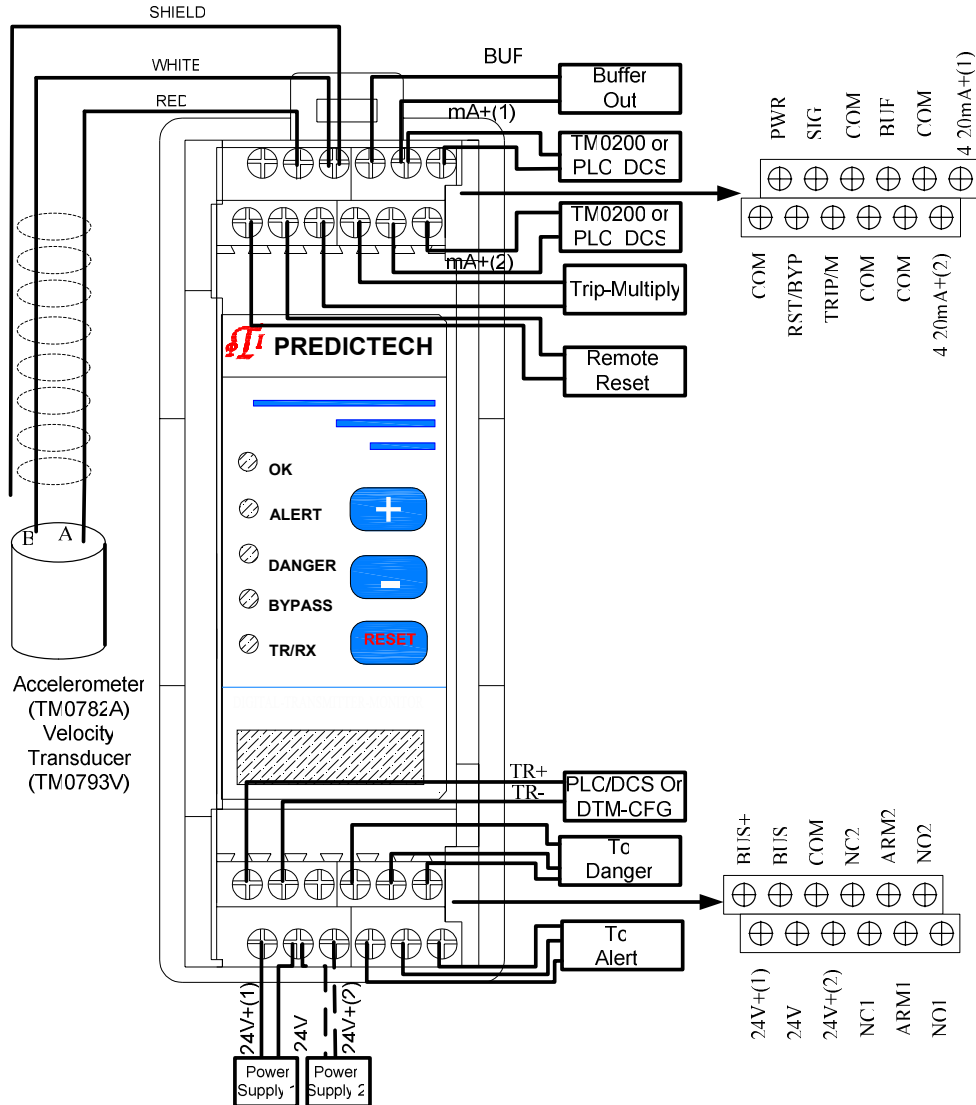**TM0793V-K:** Velocity sensor kit
TM079VD: Low frequency sensor

TM0200

3-1/2 digit display unit. Requires 110VAC or 230VAC power input.
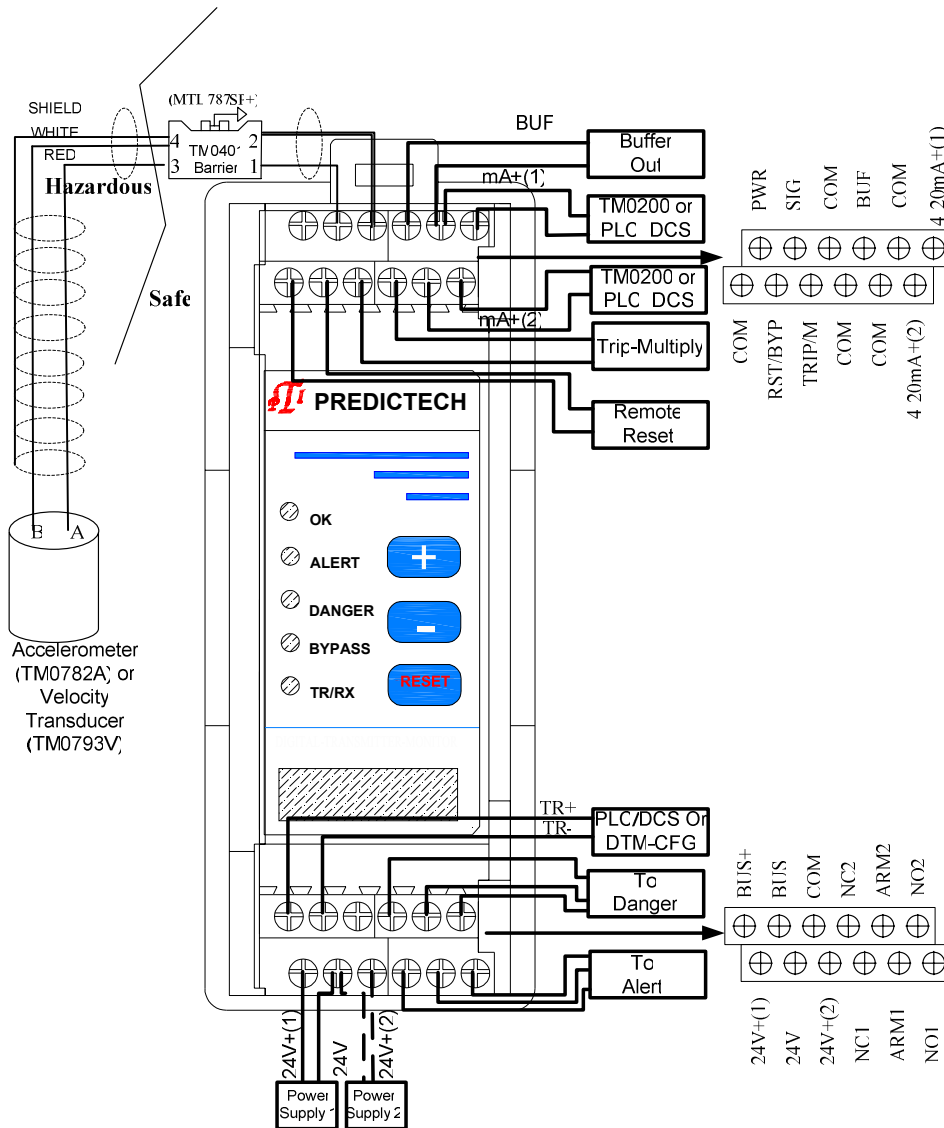
DTM20 Field-Wiring Diagram

Note:

✓ Power supply 2 is optional.

✓ Alert and Danger relays are connected as normally open. Connect ARM with NC to form a normally closed configuration.

✓ 4-20mA (2) is optional.

✓ Closing COM and RST/BYP with an external continuous or momentary switch will initiate a remote reset. Temporarily closing the switch will result in a system reset, continuous close will result in a system bypass.

✓ DTM20 series is compatible with other manufacturers' sensors (accelerometers and velocity transducers).

DTM20 Hazardous Area Field-Wiring Diagram

Note:

- ✓ Power supply 2 is optional.
- ✓ Alert and Danger relays are connected as normally open. Connect ARM with NC to form a normally closed configuration.
- ✓ 4-20mA (2) is optional.
- ✓ Closing COM and RST/BYP with an external continuous or momentary switch will initiate a remote reset. Temporarily closing the switch will result in a system reset, continuous close will result in a system bypass.
- ✓ DTM20 series is compatible with other manufacturers' sensors (accelerometer sand velocity transducers)
- ✓ Other barriers available:
  TM0402: (STAHL 9001/51-280-091-141)
  TM0407: (STAHL 9160/13-11-11)