



TM600 Series Digital-Transmitter-Monitor

TM611 Seismic Vibration Digital-Transmitter-Monitor

(Acceleration, Velocity, Displacement)

The TM611 Seismic vibration transmitter-monitor provides a simple and cost-effective solution for monitoring “balance-of-plant” equipment. The TM611’s smart design is extremely reliable with redundancy in 4-20mA outputs and relay outputs, as well as a Modbus communication port. The TM611 monitor can interface with almost any vibration sensor (accelerometer or velocity transducer).

Features

Designed with reliability

- Redundant 4-20mA outputs
- Dual dry-contact relay outputs
- Trip multiply and Bypass

Galvanic isolation for solid signal processing

- Power input isolation
- Sensor signal conditioning isolation
- Transmission 4-20mA output isolation
- Relay output isolation

Low/High Pass Filter

Programmable 8-stage low pass filter can eliminate high frequency noise better to get more reliable vibration signal.

CFG Software for Field Configuration

TM600-CFG can modify any configuration parameters of module, and can also be used for calibration.

Work with variety of vibration sensors

- Accelerometer
- Velocity sensor
- Low frequency sensor
- Electro-magnetic velocity sensor

Digital condition monitoring

Static data (trend, overall, alarms, GAP, system OK) and dynamic data (waveform, spectrum, phase reference, waterfall) will be directly transferred into server by MODBUS-TCP interface of TM691 with no needs of additional interface hardware.





TM600 Series Digital-Transmitter-Monitor

Specifications

Electrical

Power:

+24VDC:
18-30VDC, @150mA; Isolation: 1000VDC

Frequency Response (-3dB):

Nominal Frequency:

2 ~ 3 KHz

Low Frequency:

0.5 ~ 100Hz

High Frequency:

10 ~ 20 KHz (peak)

Filter:

Low Pass Filter (field programmable):

8-stage filter (160 dB /dec, 48 dB/oct)
Frequency range 100Hz - 10 kHz, can be field
programmed by CFG software

High Pass Filter (factory preset):

2-stage filter (40 dB /dec, 12 dB/oct)
4 options (0.5Hz, 2Hz, 10Hz, 100Hz) or
customized

Piezo Sensor Interface:

Sensitivity:

100mV/g
4mV/mm/s
4mV/ μ m
Or any sensitivity specified

Current Source

Nominal 4mA@24VDC

Seismic Velocity Sensor Interface:

Sensitivity:

User specified for any vibration sensor
Software programmable

Accuracy:

Typical +/-1% FS
Maximum +/-2% FS

Buffered Output:

Original vibration, un-filtered
Impedance: 150 Ω
Maximum cable distance: 300m (1000ft)
Sensitivity: same as the sensor
Local BNC connector
On line CM terminals

Overall Vibration output:

Up to two 4-20mA output
4-20mA (1):
Source. Output to controller.
Sharing signal ground
Maximum load resistance 500 Ω
4-20mA (2):
Loop. Loop powered by controller.
Galvanic isolation, 1000VDC
Power supply range: 16-30VDC
Maximum load resistance: 50*(Vs-16)
Where Vs is the loop power supply

Alarm Set point:

Range: 5 ~ 100% FS
Accuracy: \pm 0.1%.

Relays:

Seal: Epoxy.
Capacity: 0.2A/240VAC,
0.4A/110VAC
2.0A/24VDC, resistive load
Relay type: SPTD
Isolation: 1000VDC

Push Buttons:

SET: System on-site calibration and alarm setting

LED Machine Condition Indicator:

OK: System OK and Digital Transmission indication
ALM (yellow): Vibration over ALERT level
ALM (red): Vibration over DANGER level
BYP: System in BYPASS



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RESET/BYPASS:

- Front panel push button
- Remote RESET/BYPASS terminals

Trip Multiply:

- Double multiply or Triple multiply set in TM600-CFG
- Short Trip/Multi terminal to COM terminal on TM691
- System alarm level will increase by a factor of 2 or 3.

Modbus:

- RS485 Modbus RTU
- Not isolated (use TM691 for isolation)

Software programming (TM600-CFG and TM691):

- Alert and danger set-point, time delay
- ZERO and Full-Scale calibration
- Full-scale high and low setup
- Alarm latching/ non-latching, energized/ de-energized
- Alarms programmable with alert, danger or system ok
- Probe selection, linearization, and system calibration
- Monitor function change: vibration, position, or speed
- Modbus communication setup
- Trip-multiply setup
- Real-time bar-graph and alarms
- Configure speed monitor to phase reference only monitor
- 3 layers of password protection

Digital Condition Monitoring

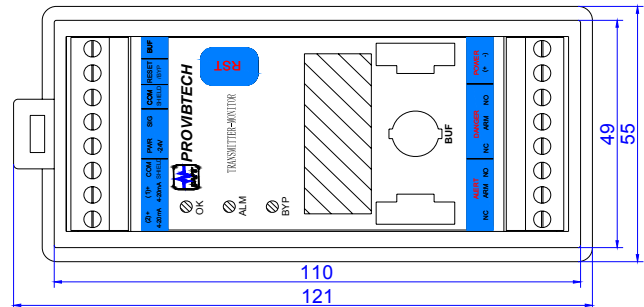
- Terminals
 - Modbus-TCP interface in TM691
- Software PCM360-LT
 - Work with PCM360-LT plant condition management software
- Dynamic waveform:
 - Real-time vibration data, 2000 sets per data acquisition.
- Alarms:
 - Up to 100 alarms can be stored in TM600
- Trend:
 - Up to 1000 trend data can be stored in TM600.
- Spectrum:
 - Up to 800 lines of resolution.

Physical

Dimension:

Height: 82mm (3.23")
See figure below

Weight: 2.0lb (1.0kg)



Rail Mounting

Environmental

Temperature:

Operation: -30°C ~ +70°C

Storage: -40°C ~ +100 °C

Humidity: 90% non-condensing

Case: Aluminum



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Ordering Information

TM611-AXX-BXX-CXX-DXX-EXX-GXX-HXX-IX-MX

Seismic monitor, can replace TM101

AXX: Full Scale

A00: 0 - 200µm pk-pk
A01: 0 - 500µm pk-pk
A02: 0 - 100µm pk-pk
A03: 0 - 250µm pk-pk
A05: 0 - 125µm pk-pk
A06*: 0 - 50mm/s pk
A07: 0 - 100mm/s pk
A08: 0 - 20mm/s pk
A11: 0 - 25mm/s pk
A12: 0 - 5.0g pk
A13: 0 - 10g pk
A14: 0 - 8mil pk-pk
A15: 0 - 20mil pk-pk
A16: 0 - 4mil pk-pk
A17: 0 - 10mil pk-pk
A18: 0 - 5mil pk-pk
A19: 0 - 2.0 ips pk
A20: 0 - 4.0 ips pk
A21: 0 - 0.8 ips pk
A20: 0 - 1.0 ips pk
A26: 0 - 50mm/s rms
A27: 0 - 100mm/s rms
A28: 0 - 20mm/s rms
A31: 0 - 25 mm/s rms
A32: 0 - 2.0 ips rms
A33: 0 - 4.0 ips rms
A34: 0 - 0.8 ips rms
A35: 0 - 1.0 ips rms
A36: 0 - 20g pk
A37: 0 - 50g pk

BXX: Power Supply

B00*: +24VDC

CXX: Alarm

C00: Epoxy Relay, Latching
C01: No Alarm.
C02*: Epoxy Relay, Non-Latching

DXX: Output

D00*: 4 ~ 20mA

EXX: Buffer Out

E00*: With Buffer Output

GXX: Mounting

G00*: DIN rail mounting

HXX: Sensor (not include)

H00*: TM0782A or any ICP accelerometer with
100mV/g (A00~A05 not available)
H01: TM0793V or any ICP velocity sensor with
4mV/mm/s (A12, 13, 36, 37 not applicable)
H02: TM079VD (A12, 13, 36, 37 not available)
H99: Custom-Design

IX: Frequency Response.

I0*: Normal Frequency (2 ~ 3 KHz, H2 not available)
I1: Low Frequency (0.5~100Hz)
I2: High frequency (10 - 20 KHz,
A12, 13, 36, 37 only with accelerometer)

IXXX-YYYY**:

XXX: Hi-pass filter;

YYYY: low pass filter

MX: Output/Communication

M1*: 4-20mA without isolation, no CM
M2: 4-20mA without isolation, with CM
M3: 4-20mA with isolation, no CM
M4: 4-20mA with isolation, with CM
M5: Dual 4-20mA, no CM
M6: Dual 4-20mA, with CM

* Denotes factory default.

*** Low pass has to be 4X more than high pass filter.



Optional Accessories

TM600-CFG-K

The TM600 configuration and calibration software kit includes:

- ✓ TM600 -CFG configuration and calibration software CD
- ✓ Network cable

TM900

Power converter with isolation. Converts 95-250 VAC into 24VDC and is capable of powering up to 7 TM611 modules.

Seismic Sensor Systems

- ✓ **TM0782A-M:** Accelerometer
- ✓ **TM0783A-M:** Accelerometer with cable
- ✓ **TM0793V-M:** Velocity sensor
- ✓ **TM079VD-V/H:** Low frequency sensor

. BUS Cable

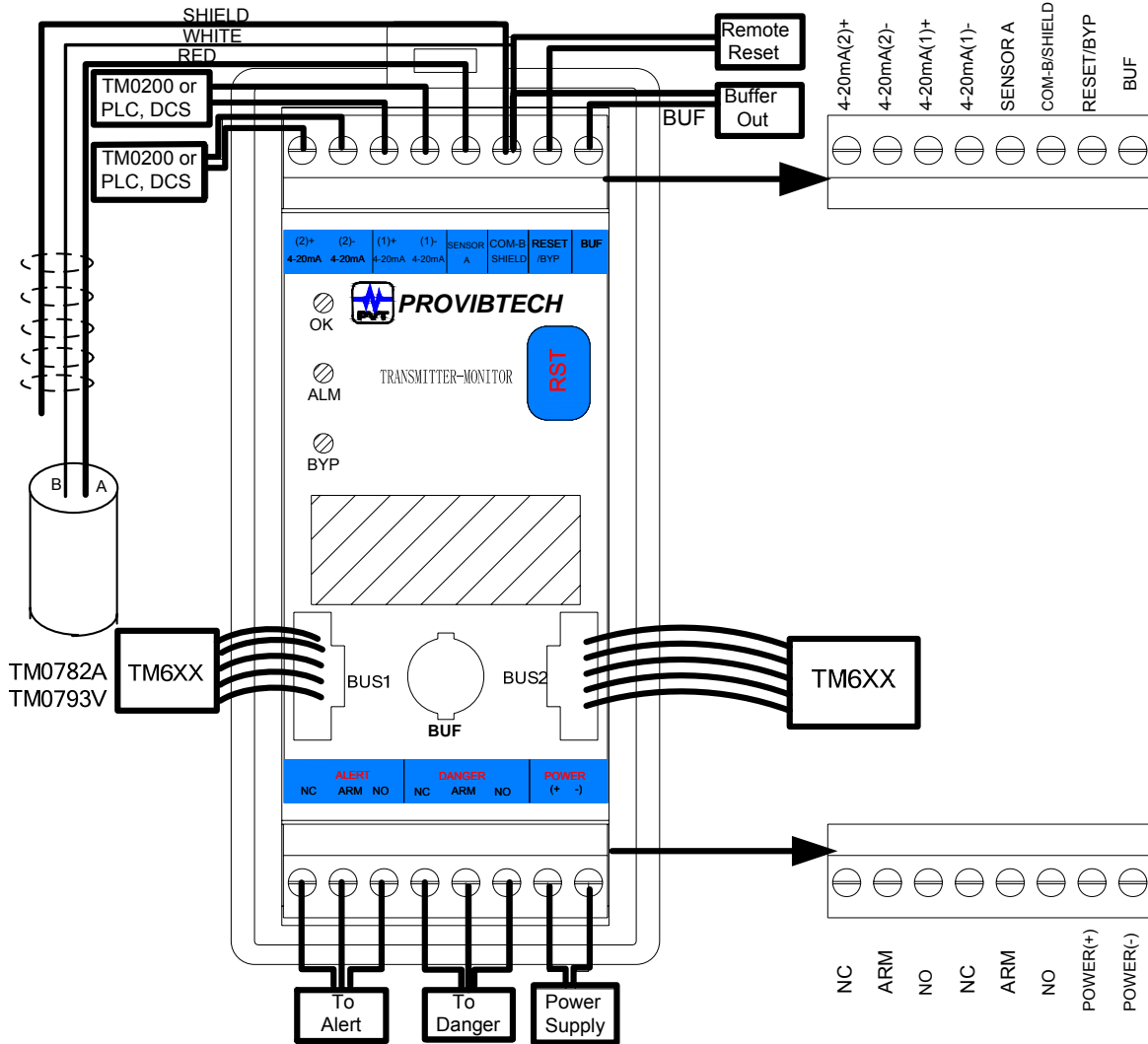
- ✓ **TM695-08:** 70mm Cable, used to connected BUS interface of TM691 to BUS2 interface of TM611 or connected BUS1 interface of TM611 to BUS2 interface of another TM611.
- ✓ **TM695-22:** 200mm Cable, used to connected BUS1 interface of TM691 to BUS1 interface of another TM611.



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TM611 System Installation

TM611 Field-Wiring Diagram



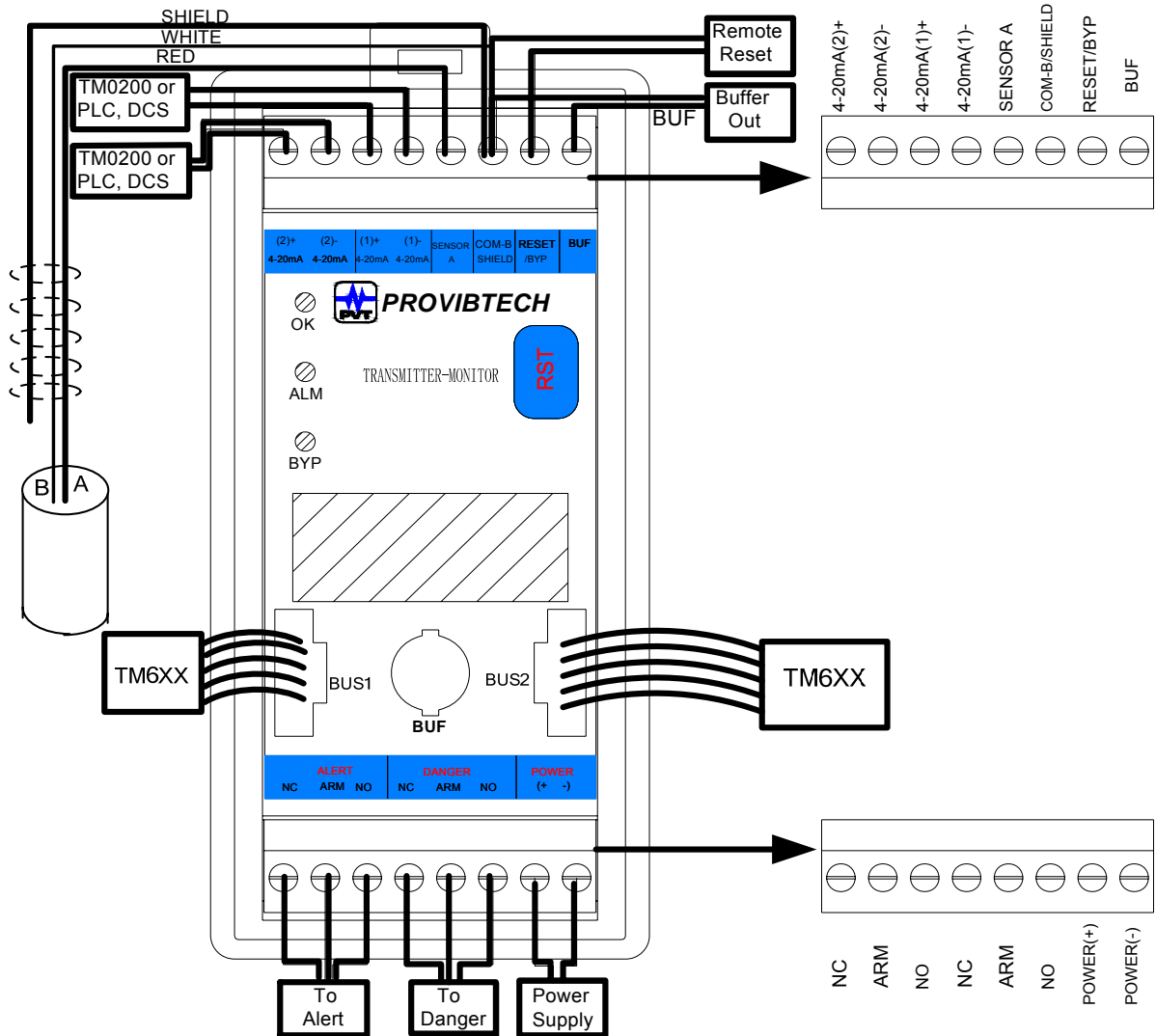
Note:

- ✓ 4-20mA (2) is redundancy outputs.
- ✓ Alert and Danger relays are shown connected as normally open. Connect ARM and NC for normally closed.
- ✓ Connecting COM and RESET/BYP with an external continuous or momentary closed switch will initiate a remote reset. Temporarily closing the switch will result in a system reset, continuous close will result in a system bypass.
- ✓ See appendix I when TM6XX used to replace TM monitor in the field.



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TM611 Field-Wiring Diagram



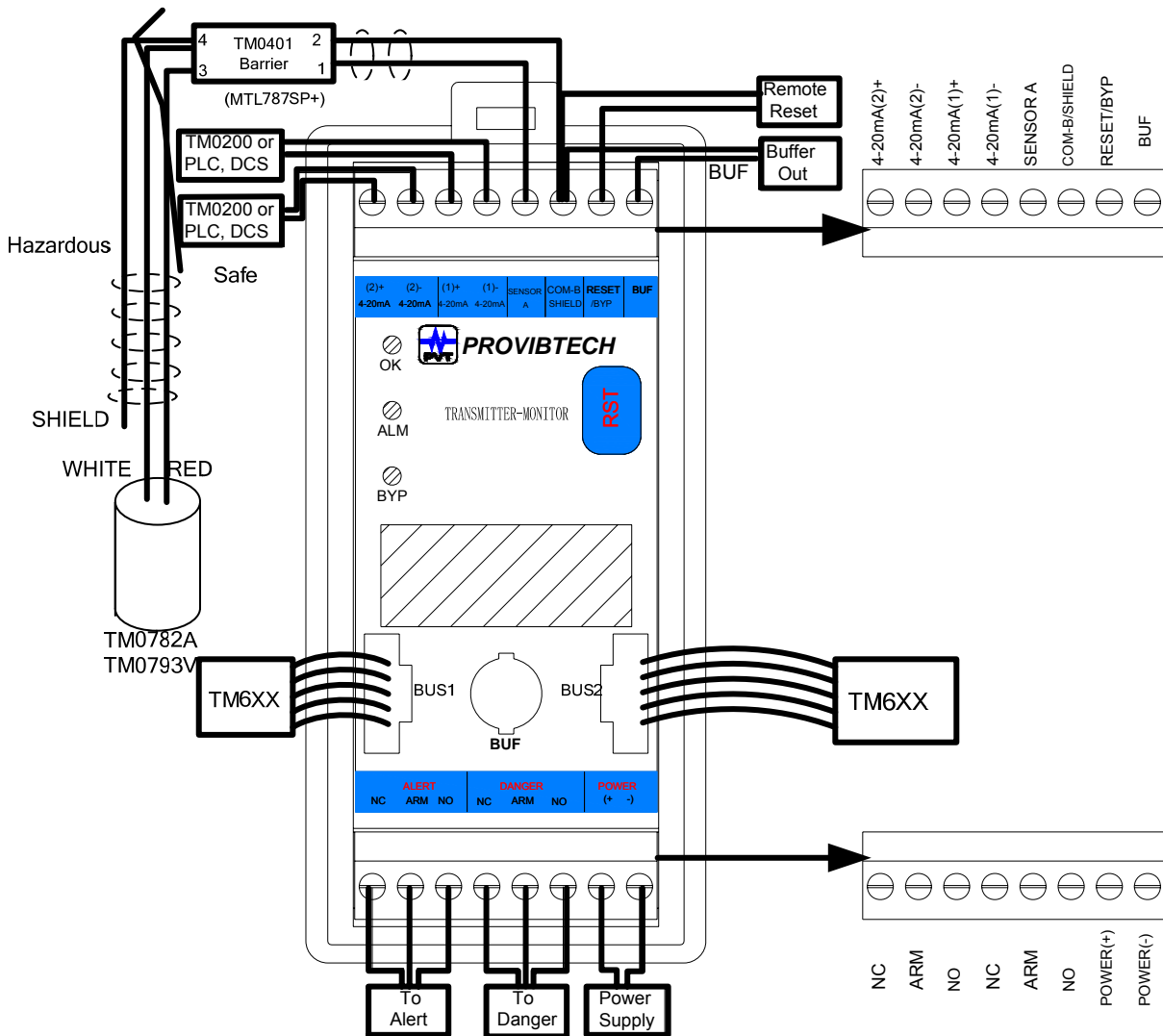
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TM611 Hazardous Area Field-Wiring Diagram



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