



DTM Distributed Transmitter Monitor

Looseness Monitor DTM20-A4

The DTM20-A4 is designed for monitoring reciprocating compressors & engines. It is a multiple parameter monitor with both impact monitoring and acceleration monitoring. Alarm can be the combination of these two parameters. You can conveniently decide the alarm level of each of the monitored parameters and setup accordingly. In addition to analog transmission, the monitor also supplies a digital output, dual alarms, and a condition monitoring. Thus greatly enhanced the analysis and monitoring capabilities of the system. The looseness monitor conforms to ISO10816-6.



Waveform and spectrum (with software)

Looseness Monitor Unique Features

Precision Looseness Monitor

Programmable impact trigger level and time base.
Impact is set in acceleration (g's) with DTM-Config software.
Highly repeatable with quantitative measurement

Multiple parameters monitoring

Not only monitoring looseness impact but also overall acceleration
Both parameters can be monitored and alarmed

Multiple outputs

Analog transmission via dual 4-20mA
Digital Modbus RTU output
Dual programmable alarms

More accurate impact response

Industrial, light weight accelerometer (100mv/g -pk constant current) makes the measurement more responsive to high frequency and repeatable

Live waveform helps trigger level setting

Within the configuration process, the live waveform can be analyzed to decide the looseness trigger level thus minimize the "estimated" uncertainty

Designed with reliability

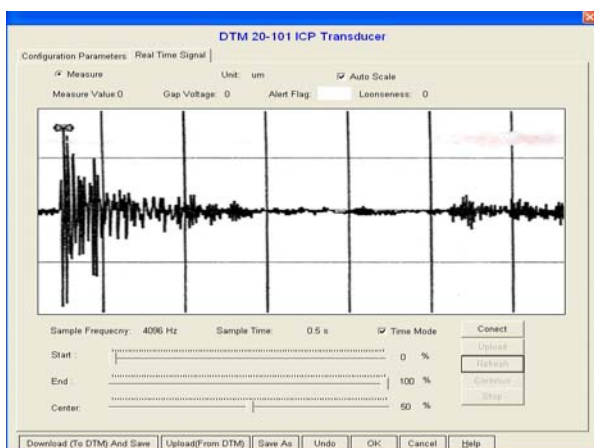
Redundant power supplies
Redundant 4-20mA outputs
Dual dry-contact relay outputs
Trip multiply and Bypass

Galvanic/optical isolation for solid signal processing

Power input isolation
Sensor signal conditioning isolation
Transmission 4-20mA output isolation
Relay output isolation
Digital output isolation with DTM96

Fully field programmable by CFG software

DTM20-CFG can easily change any configuration of the monitor.
Calibration of the system is available with CFG software





DTM Distributed Transmitter Monitor

Reciprocating condition monitoring by direct digital connection

Static registers (trend, overall, alarms, GAP, system OK)
Dynamic signal (waveform, spectrum, phase reference, waterfall)

Data will be directly transferred into server with no needs of additional interface hardware

MODBUS digital communication

Build-in Modbus RTU digital communication
More register information from Modbus

Specifications

Electrical

Power:

Redundant. Accept dual power input
20-30VDC @150mA
Galvanic isolation: 1000VDC

Frequency Response:

100~1200rpm

Piezo Sensor Interface:

Sensitivity:

100mV/g -pk

Current Source

Nominal : 4mA@24VDC

Monitor Accuracy:

Typical +/-2% FS
Maximum +/-5% FS

Buffered Output:

Original vibration, un-filtered
Impedance: 150Ω
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 outputs
4-20mA(1):
Source.
Sharing sensor ground
Maximum load resistance 500Ω

4-20mA(2):

Loop. Loop powered by controller.
Optical isolation, 1000VDC
Power supply range: 16-30VDC
Maximum load resistance: 50*(Vs-16)
Where Vs is the loop power supply

Alarm Set Point:

5 ~ 100% FS
Accuracy:
±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
+ : Adjustment increment
- : Adjustment decrement

LED Machine Condition Indicator:

OK: System OK indication
ALT: Vibration over Alert level
DNG: Vibration over Danger level
BYP: System in BYPASS
TRX: Digital transmission active

RESET/BYPASS:

Front panel push-button
Remote RESET/BYPASS terminals



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Trip-Multiply

Double or Triple Multiply set by DTM-CFG. This feature is not available with (M2,M4 and M6)

Modbus RTU

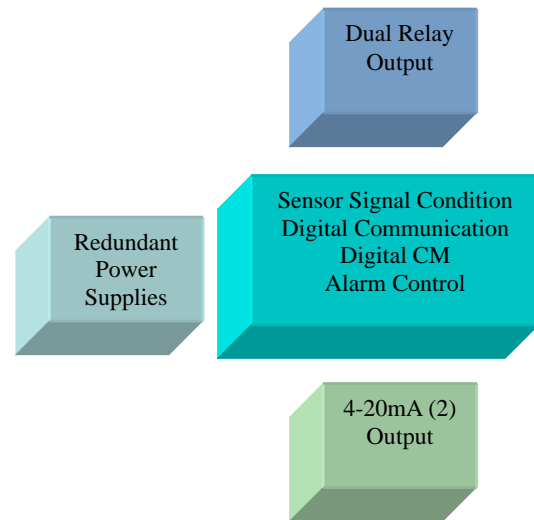
RS485 Modbus RTU (with DTM96 for isolation)

Software programming (DTM-CFG):

- Alert and danger set-point, time delay
- ZERO and Full-Scale calibration
- Alarm latching/ non-latching, energized/ de-energized
- Relay programmable with alert, danger or system OK
- Sensor selection, sensitivity setup
- System calibration
- Digital communication setup
- Trip-multiply setup
- Real-time bar-graph and alarms
- 3 layers of password protection

Digital Condition Monitoring

- Terminals
 - RS485 for both Modbus RTU and condition monitoring
- 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 DTM20.
- Trend:
 - Up to 1000 trend data can be stored in DTM20.
- Spectrum:
 - Up to 800 lines of resolution.



*Building Block of DTM20
All modules are isolated
Digital output isolation via DTM96*

Physical

- Dimension:
 - Height: 75mm (2.95")
see figure below
 - Weight: 0.9lb (0.4kg)

Environmental

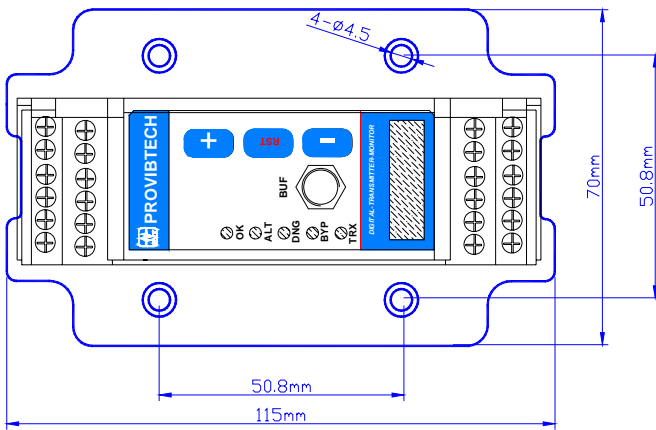
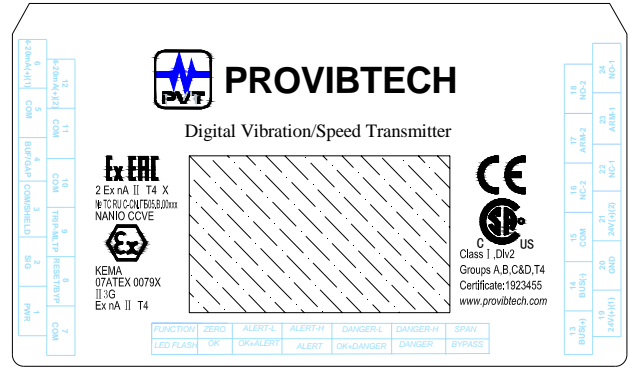
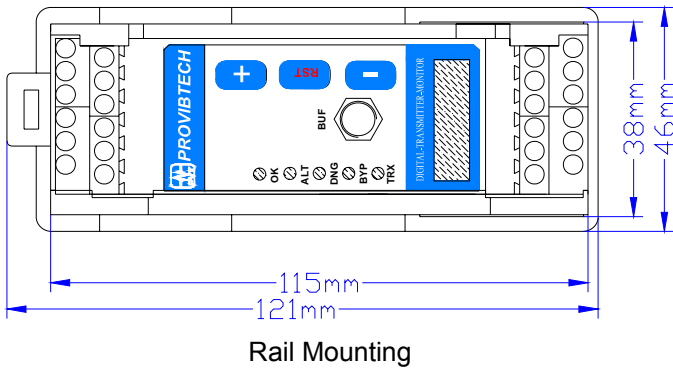
- Temperature:
 - Operation: -40°C ~ +85°C.
 - Storage: -50°C ~ +100°C.
- Humidity: 90% non-condensing.
- Case: Aluminum cast (copper free)

Certification

- CE certified with EMI compliance
- CSA: Class I, Div. 2, Grps A,B,C&D,T4
- ATEX: II 3 G Ex nA II T4
- TR CU: 2Ex nA II T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE



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Hazardous area

Marking:

ATEX Standards:

EN 60079-0

EN 60079-15

Special condition in hazardous area:

- The ambient temperature range is: $-40^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$
- DTMs must be placed inside an enclosure that is in accordance with EN 60079-15:2005.
- Provisions must be made externally to prevent the rated voltage from being exceeded by transient disturbances of more than 40 %.



Ordering Information

DTM20-A4-B0-I2-MX-SX-TXXX

Looseness monitor, fully field configurable, with Modbus RTU.

MX: Condition Monitoring,

4-20mA with Optical Isolation*

M5*: Dual 4-20mA, no Condition monitoring

M6: Dual 4-20mA, with Condition monitoring

SX: Approvals.

S0*: CE

S1: CE

CSA: Class I, Div. 2, Grps A,B,C&D,T4

ATEX: II 3 G Ex nA II T4

TR CU: 2Ex nA II T4X

№ TC RU C- US.ГБ05.B.00476

NANIO CCVE

TXXX: Running Speed

XXX: Running at XXX rpm

* Isolated 4-20mA requires external loop power.

Optional Accessories

DTM-CFG-K

The DTM configuration and calibration software kit includes:

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

PCM-TCP

Modbus RTU-TCP Converter

TM900

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

Seismic Sensor Systems

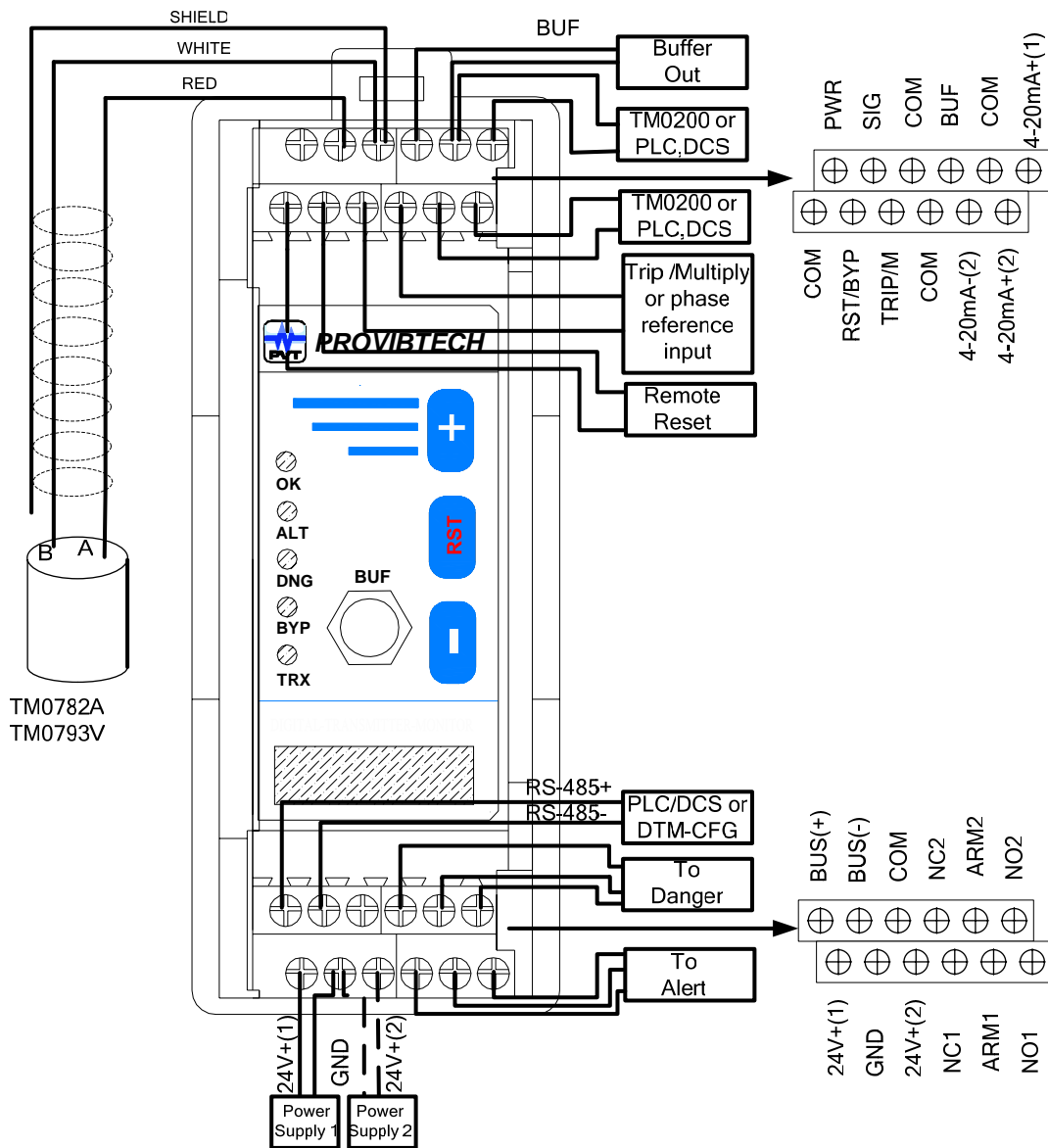
- ✓ **TM0782A-K-M:** Accelerometer kit
- ✓ **TM0783A-K-M:** Accelerometer with cable
- ✓ **TM0793V-K-M:** Velocity sensor kit
- ✓ **TM079VD-V/H-K:** Low frequency sensor



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DTM20 System Installation

DTM20 Field-Wiring Diagram



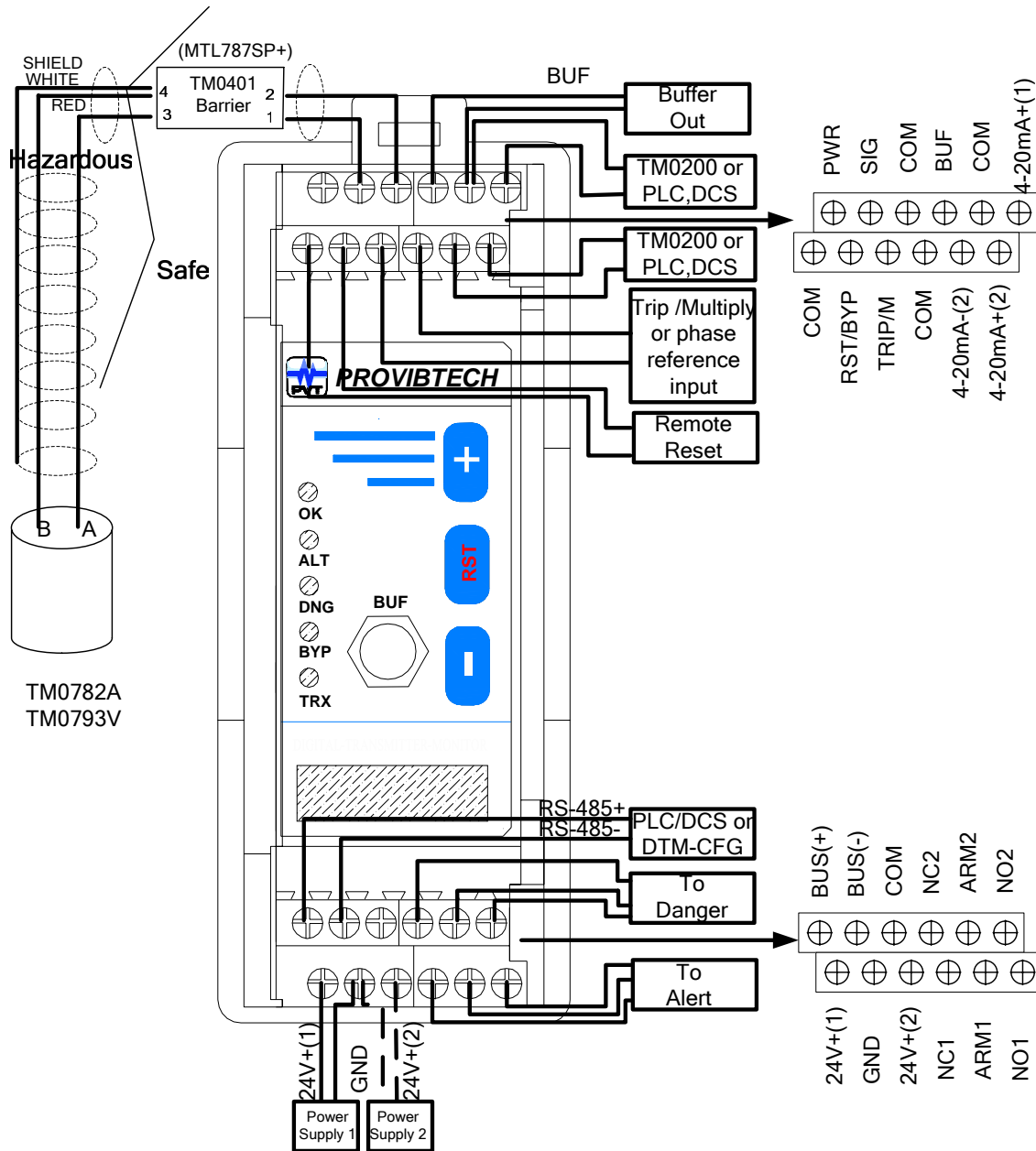
Note:

- ✓ Power supply 2 is optional connection used for redundancy.
- ✓ Alert and Danger relays are shown connected as normally open. Connect ARM and NC for normally closed.
- ✓ Connecting COM and RST/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.
- ✓ If DTM20 has the digital condition monitoring function, the Trip/Multi and COM pins are used for phase reference input. Thus, the DTM20 won't provide the Trip Multiply and the Trip Multiply property should be set to "None" in the DTM-CFG software.
- ✓ When using the signal condition monitoring function the DTM20 works with DTM10-501/502 to provide a phase reference output. In this case connect Trip/Multi of DTM20 with Trip/Multi of DTM10-501/502 and connect COM of DTM20 with COM of DTM10-501/502.



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DTM20 Hazardous Area (Div. I, Zone I) Field-Wiring Diagram



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