



## DTM10 Proximity Distributed Transmitter-Monitor

(Shaft Vibration, Thrust Position and Speed)

The DTM10 distributed vibration transmitter-monitor is ideal for monitoring machine vibration using proximity probes and a Modbus interface to a PLC or DCS system. The DTM also contains redundant power supplies and redundant 4-20mA transmissions. Using Provibtech's unique strategy, the DTM can interface with almost any proximity probe system without hardware changes.

### Applications include:

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

### DTM10 Fully Configurable via Software

- ✓ Vibration Monitor Module
- ✓ Thrust Position Monitor Module
- ✓ Speed Monitor Module
- ✓ Phase Reference Monitor module
- ✓

### DTM10 Features

- ✓ Interface with almost any manufacture's proximity probe system
- ✓ Works with or without probe driver
- ✓ Direct Modbus RTU interface
- ✓ Redundant 4-20mA outputs
- ✓ Redundant power supplies
- ✓ Measure shaft vibration, thrust position, or speed
- ✓ Full digital field-configuration
- ✓ Dual alarms (SPDT)
- ✓ LED indication of system OK, Alert , Danger, and Bypass
- ✓ Local and remote RESET/BYPASS and Trip-multiply
- ✓ Buffered Output for condition monitoring
- ✓ Aluminum case for RFI/EMI reduction
- ✓ Digital condition monitoring (optional)





## Specifications

### Electrical

#### Power Supply:

22-30VDC, 150mA.  
Galvanic isolation

#### Frequency Response (-3dB):

Nominal frequency: 4 ~ 3.0KHz  
Low frequency: 0.5 ~ 100Hz

#### Proximity probe Interface:

Sensitivity:  
5mm and 8mm probe: 8 mV/um (200 mv/mil)  
11mm probe: 4 mV/um (100 mv/mil)  
25mm probe: 2mV/um (50 mv/mil)

#### Buffered Output:

Original, un-filtered signal  
Impedance: 150Ω  
Maximum cable distance: 300m (1000ft)  
Sensitivity: same as the sensor  
Local BNC connection and terminal block

#### 4-20mA Output:

Dual 4-20mA, sourced (loop power not required)  
Maximum load resistance: 380Ω

#### Alarm Setup:

0 ~ 100% FS.  
Accuracy: ±0.1%.

#### Relays:

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

#### 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

#### Trip Multiply:

Double Multiply or Triple Multiply set in DTM-CFG  
Short Trip/Multi terminal to COM terminal  
System alarm level will increase by a factor of 2 or 3  
(DTM10-201 / 301 only)

#### Modbus:

RS485 Modbus RTU  
Not isolated (use DTM96 for isolation)

#### Local push button programming:

Alert and danger set-point, ZERO calibration

#### Software programming (DTM-CFG):

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 (optional)

Condition management software or portable vibration data collector of ProvibTech could collect, store, and analyze machine health condition based on vibration via the bus communication of the DTM10.

#### Dynamic waveform data:

Real-time vibration data could be uploaded and the waveform and spectrum plot could be view by Condition management software or portable vibration data collector.

#### Trend Data:

The vibration data could be periodically stored by the DTM10 when it's powered on. User could collect trend data and view trend plots by Condition management software or portable vibration data collector. The trend sampling interval is configured



# DTM Distributed Transmitter Monitor

by the related DTM-CFG software. DTM10's factory default is 10 hours. Every DTM10 could store maximum 1024 trend data.

### Alarm Data:

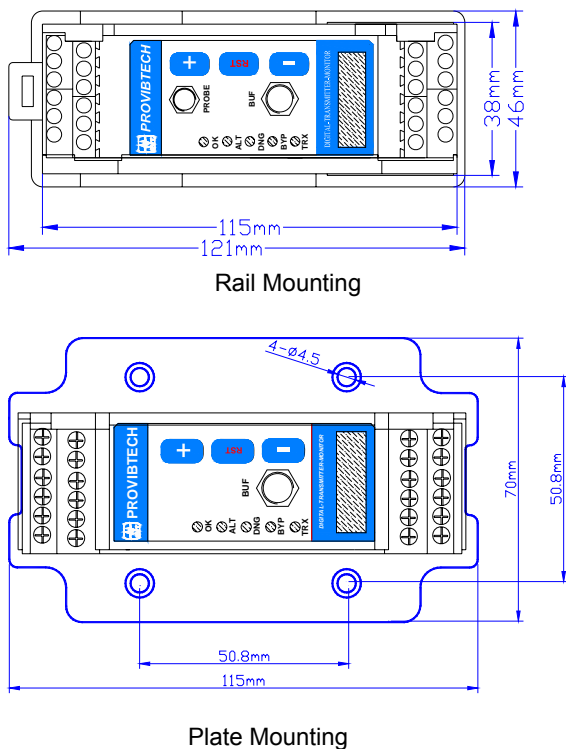
The dynamic alarm data could be stored by the DTM10 when it's powered on. The DTM10 only stores one alarm data with highest measured value. User could view waveform and spectrum plot of alarm data by Condition management software or portable vibration data collector.

### 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

### Certification

CE certified with EMC compliance

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

ATEX: II 3 G Ex nA II T4

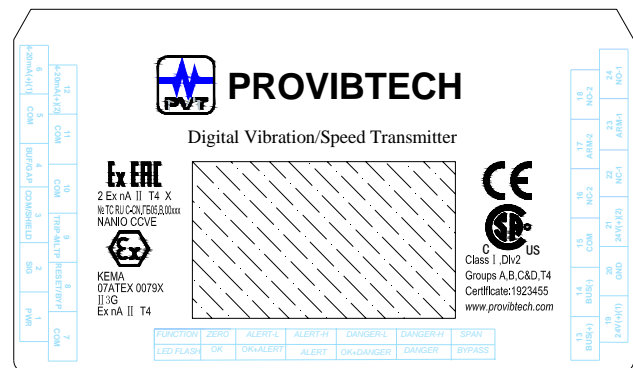
TR CU: 2Ex nA II T4 X

№ TC RU C-US.ГБ05.В.00476

NANIO CCVE

### 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

### DTM10-AX-BX-CX-EXX-MX-SX

#### Customer configurable proximity distributed transmitter-monitor

Distributed vibration monitor, fully field configurable, with Modbus RTU.

#### AX: Alarms.

- A0: With Epoxy sealed relays
- A1: No Alarm

#### BX: Mounting.

- B0: DIN rail mounting.
- B1: Plate mounting.

#### CX: External Proximity Driver.

- C0: Not required (Requires Probe and Extension Cable) (301, 302, 502 type modules)
- C1: Required (Requires Probe, Extension Cable and Probe Driver) (201, 202, 501 type modules)

#### EXX: Probe and Cable (Series and Length) -Purchased Separately

- E00\*: TM0180, 5m Cable
- E01: TM0180, 9m Cable
- E02: 8mm Probe, 3300, 5m Cable
- E03: 8mm Probe, 3300, 9m Cable
- E04: 8mm Probe, 7200, 5m Cable
- E05: 8mm Probe, 7200, 9m Cable
- E06: TM0105, 5m Cable
- E07: TM0105, 9m Cable
- E08: TM0110, 5m Cable
- E09: TM0110, 9m Cable
- E10: 11mm Probe, 3300, 5m Cable
- E11: 11mm Probe, 3300, 9m Cable
- E12: 11mm Probe, 7200, 5m Cable
- E13: 11mm Probe, 7200, 9m Cable
- E99: Other probe systems (requiring field calibration)

#### MX: Digital Communication

- M1\*: With Modbus
- M2: With Modbus and digital 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 T4 X
- № TC RU C-US.ГБ05.B.00476
- NANIO CCVE

### DTM10-201-AX-CX-GX-IX-MX-SX

#### Factory configured for vibration (probe driver required)

#### AX: Full Scale.

- A0\*: 0 ~ 200um pk-pk
- A1: 0 ~ 1000um pk-pk
- A2: 0 ~ 100um pk-pk
- A3: 0 ~ 10mil pk-pk
- A4: 0 ~ 50mil pk-pk
- A5: 0 ~ 5.0mil pk-pk
- A6: 0 ~ 200um pk-pk (0.5 ~ 100Hz)
- A7: 0 ~ 1000um pk-pk (0.5 ~ 100Hz)
- A8: 0 ~ 100um pk-pk (0.5 ~ 100Hz)

#### CX: Alarms.

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

#### GX: Mounting.

- G0\*: DIN rail mounting.
- G1: Plate mounting.

#### IX: Frequency Response.

- I0\*: Normal Frequency (4~3000Hz)
- I1: Low Frequency (0.5~100Hz)

#### MX: Digital Communication

- M1\*: With Modbus
- M2: With Modbus and digital 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 T4 X
- № TC RU C-US.ГБ05.B.00476
- NANIO CCVE



## DTM Distributed Transmitter Monitor

### DTM10-202-AX-CX-GX-SX

**Factory configured for axial position (probe driver required)**

**AX: Full Scale.**

- A0\*: -1.0 - 0 - 1.0mm (-40 - 0 - 40mil)  
(Requires TM0180 or other 8mm proximity probe transducer; TM0105 or other 5mm proximity probe transducer)
- A1: -2.0 - 0 - 2.0mm (-80 - 0 - 80mil)  
(Requires TM0110 or other 11mm proximity probe transducer)
- A2: -5.0 - 0 - 5.0mm (-0.2 - 0 - 0.2inch)  
(Requires TM0120 or other 25mm, 35mm proximity probe transducer)
- A3: -12.0 - 0 - 12.0mm (-0.5 - 0 - 0.5inch)  
(Requires TM0150 or other 50mm proximity probe transducer)

**CX: Alarms.**

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

**GX: Mounting.**

- G0\*: DIN rail mounting.
- G1: Plate mounting.

**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 T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE

### DTM10-501-AX-CX-FXX-GX-SX

**Factory configured for speed (probe driver required)**

**AX: Full Scale.**

- A0: 0 ~ 1,000 rpm
- A1\*: 0 ~ 3,600 rpm
- A2: 0 ~ 6,000 rpm
- A3: 0 ~ 10,000 rpm
- A4: 0 ~ 30,000 rpm
- A5: 0 ~ 50,000 rpm
- A6: phase reference output
- A7: phase reference output for digital condition monitoring

**CX: Alarm.**

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

**FXX: Teeth per Revolution.**

- F01\*: 1
- FXX: Customer specify, number of teeth =XX

**GX: Mounting.**

- G0\*: DIN rail mounting.
- G1: Plate mounting.

**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 T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE



## DTM10-301-AX-CX-EXX-GX-IX-MX-SX

Factory configured for vibration (built-in probe driver)

### AX: Full Scale.

- A0\*: 0 ~ 200um pk-pk
- A1: 0 ~ 500um pk-pk
- A2: 0 ~ 100um pk-pk
- A3: 0 ~ 10mil pk-pk
- A4: 0 ~ 25mil pk-pk
- A5: 0 ~ 5.0mil pk-pk
- A6: 0 ~ 200um pk-pk (0.5 ~ 100Hz)
- A7: 0 ~ 500um pk-pk (0.5 ~ 100Hz)
- A8: 0 ~ 100um pk-pk (0.5 ~ 100Hz)

### CX: Alarms.

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

### EXX: Probe and Cable.

- E00\*: TM0180, 5m Cable
- E01: TM0180, 9m Cable
- E02: 8mm Probe, 3300, 5m Cable
- E03: 8mm Probe, 3300, 9m Cable
- E04: 8mm Probe, 7200, 5m Cable
- E05: 8mm Probe, 7200, 9m Cable
- E06: TM0105, 5m Cable
- E07: TM0105, 9m Cable
- E08: TM0110, 5m Cable
- E09: TM0110, 9m Cable
- E10: 11mm Probe, 3300, 5m Cable
- E11: 11mm Probe, 3300, 9m Cable
- E12: 11mm Probe, 7200, 5m Cable
- E13: 11mm Probe, 7200, 9m Cable

### GX: Mounting.

- G0\*: DIN rail mounting.
- G1: Plate mounting.

### IX: Frequency Response.

- I0\*: Normal Frequency (4~3000Hz)
- I1: Low Frequency (0.5~100Hz)

### MX: Digital Communication

- M1\*: With Modbus
- M2: With Modbus and digital 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 T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE

## DTM10-302-AX-CX-EXX-GX-SX

Factory configured for axial position (built-in probe driver)

### AX: Full Scale.

- A0\*: -1.0 - 0 - 1.0mm (-40 - 0 - 40mil)  
(Requires TM0180 or other 8mm proximity probe transducer)
- A1: -2.0 - 0 - 2.0mm (-80 - 0 - 80mil)  
(Requires TM0110 or other 11mm proximity probe transducer)

### CX: Alarms.

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

### EXX: Probe and Cable.

- E00\*: TM0180, 5m Cable
- E01: TM0180, 9m Cable
- E02: 8mm Probe, 3300, 5m Cable
- E03: 8mm Probe, 3300, 9m Cable
- E04: 8mm Probe, 7200, 5m Cable
- E05: 8mm Probe, 7200, 9m Cable
- E06: TM0105, 5m Cable
- E07: TM0105, 9m Cable
- E08: TM0110, 5m Cable
- E09: TM0110, 9m Cable
- E10: 11mm Probe, 3300, 5m Cable
- E11: 11mm Probe, 3300, 9m Cable
- E12: 11mm Probe, 7200, 5m Cable
- E13: 11mm Probe, 7200, 9m Cable

### GX: Mounting.

- G0\*: DIN rail mounting.
- G1: Plate mounting.

### 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 T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE



## DTM10-502-AX-CX-EXX-FXX-GX-SX

Factory configured for speed (built-in probe driver)

### AX: Full Scale.

- A0: 0 ~ 1,000 rpm
- A1\*: 0 ~ 3,600 rpm
- A2: 0 ~ 6,000 rpm
- A3: 0 ~ 10,000 rpm
- A4: 0 ~ 30,000 rpm
- A5: 0 ~ 50,000 rpm
- A6: phase reference output
- A7: phase reference output for digital condition monitoring

### CX: Alarms.

- C0\*: Dual alarms with epoxy sealed relays
- C1: No Alarm

### EXX: Probe and Cable.

- E00\*: TM0180, 5m Cable
- E01: TM0180, 9m Cable
- E02: 8mm Probe, 3300, 5m Cable
- E03: 8mm Probe, 3300, 9m Cable
- E04: 8mm Probe, 7200, 5m Cable
- E05: 8mm Probe, 7200, 9m Cable
- E06: TM0105, 5m Cable
- E07: TM0105, 9m Cable
- E08: TM0110, 5m Cable
- E09: TM0110, 9m Cable
- E10: 11mm Probe, 3300, 5m Cable
- E11: 11mm Probe, 3300, 9m Cable
- E12: 11mm Probe, 7200, 5m Cable
- E13: 11mm Probe, 7200, 9m Cable

### FXX: Teeth per Revolution.

- F01\*: 1
- FXX: Customer specify, number of teeth =XX

### GX: Mounting.

- G0\*: DIN rail mounting.
- G1: Plate mounting.

### 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 T4 X
- № TC RU C- US.ГБ05.B.00476
- NANIO CCVE

## Optional Accessories

### DTM-CAL

The DTM field calibration kit is capable of calibrating any 5mm, 8mm, or 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

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.

### Proximity Sensor Systems

- ✓ **TM0180:** 8mm probe
- ✓ **TM0105:** 5mm probe
- ✓ **TM0110:** 11mm probe
- ✓ **TM0181:** Extension cable
- ✓ **TM0182:** Probe driver
- ✓ **TM0120:** 25mm probe system

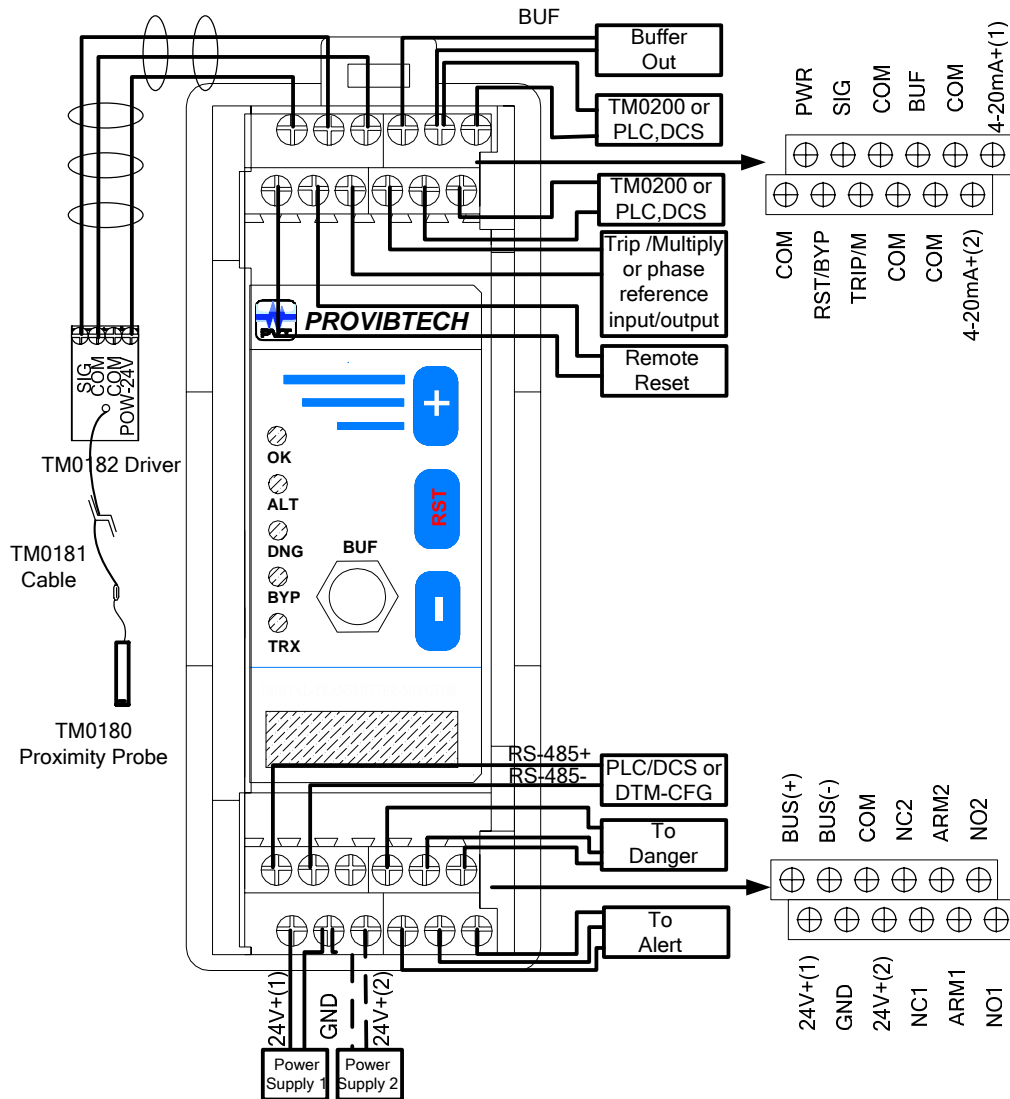
\* Denote factory default.



# DTM Distributed Transmitter Monitor

## DTM10 System Installation

### DTM10-201/202/501 Field-Wiring Diagram



#### Note:

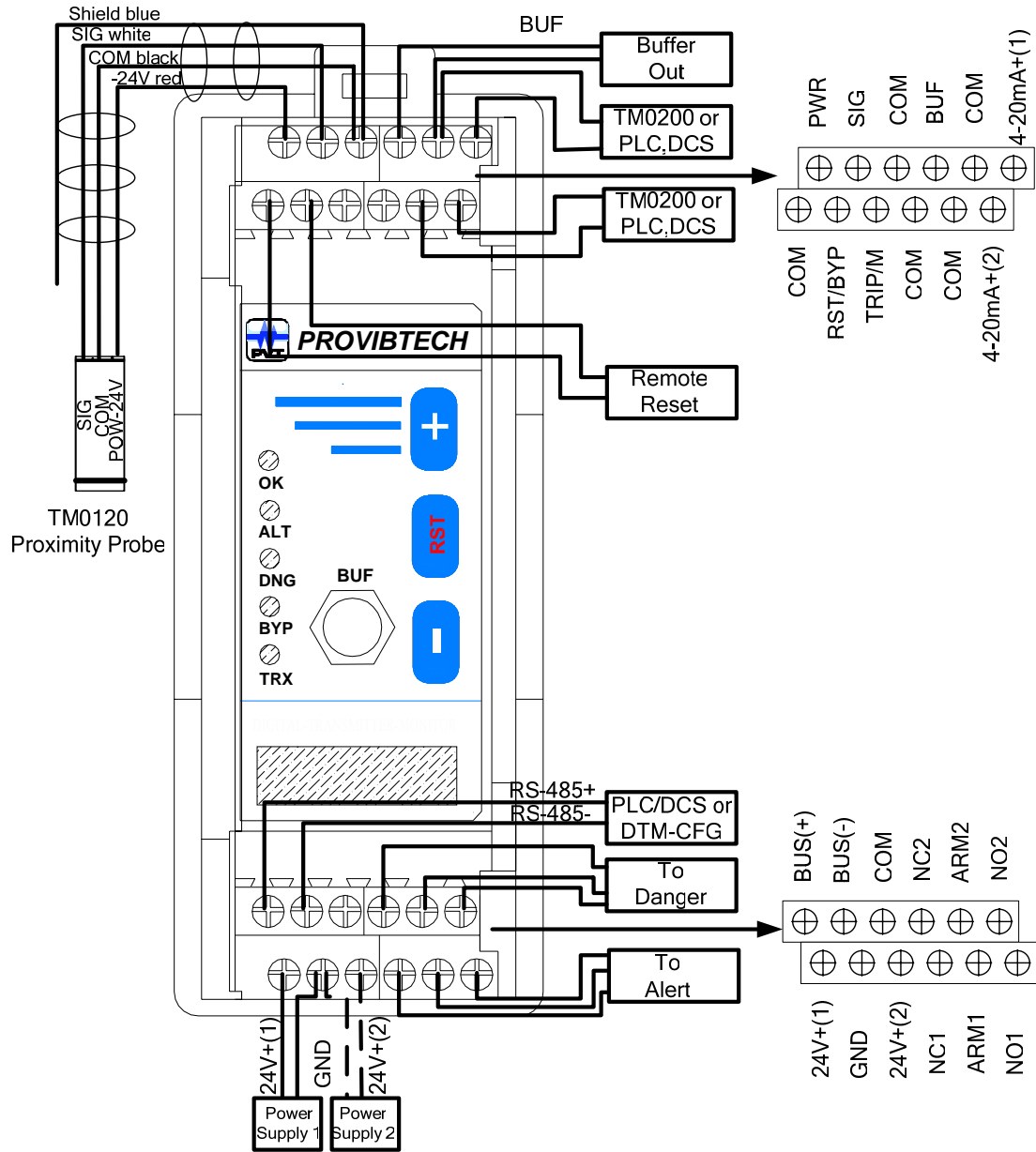
- ✓ Power supply 2 and 4-20mA(2) are optional outputs used for redundancy.
- ✓ Alert and Danger relays are shown connected as normally open. Connect ARM and NC for normally closed.
- ✓ Connecting COM and RST/BYP with an external continuous or momentary closed switch will initiate a remote reset. Temporarily closing the switch will result in a system reset, continuous close will result in a system bypass.
- ✓ If the DTM10-201 has the digital condition monitoring function, the Trip/Multi and COM pins are used for phase reference input. Moreover, the DTM10-201 won't provide Multiply Alarm function anymore, so you should set Multiply Alarm property to "None" by DTM-CFG software.
- ✓ If Full Scale of DTM10-501 is phase reference output for digital condition monitoring (A7), Trip/Multi terminal provides the phase reference signal for the DTM10-201, DTM10-301, DTM20-101 or DM200. A DTM10-501 can provide the phase reference signal for up to 6 DTMs or DM200s.





# DTM Distributed Transmitter Monitor

DTM10-202 Field-Wiring Diagram (Interfacing with TM0120)



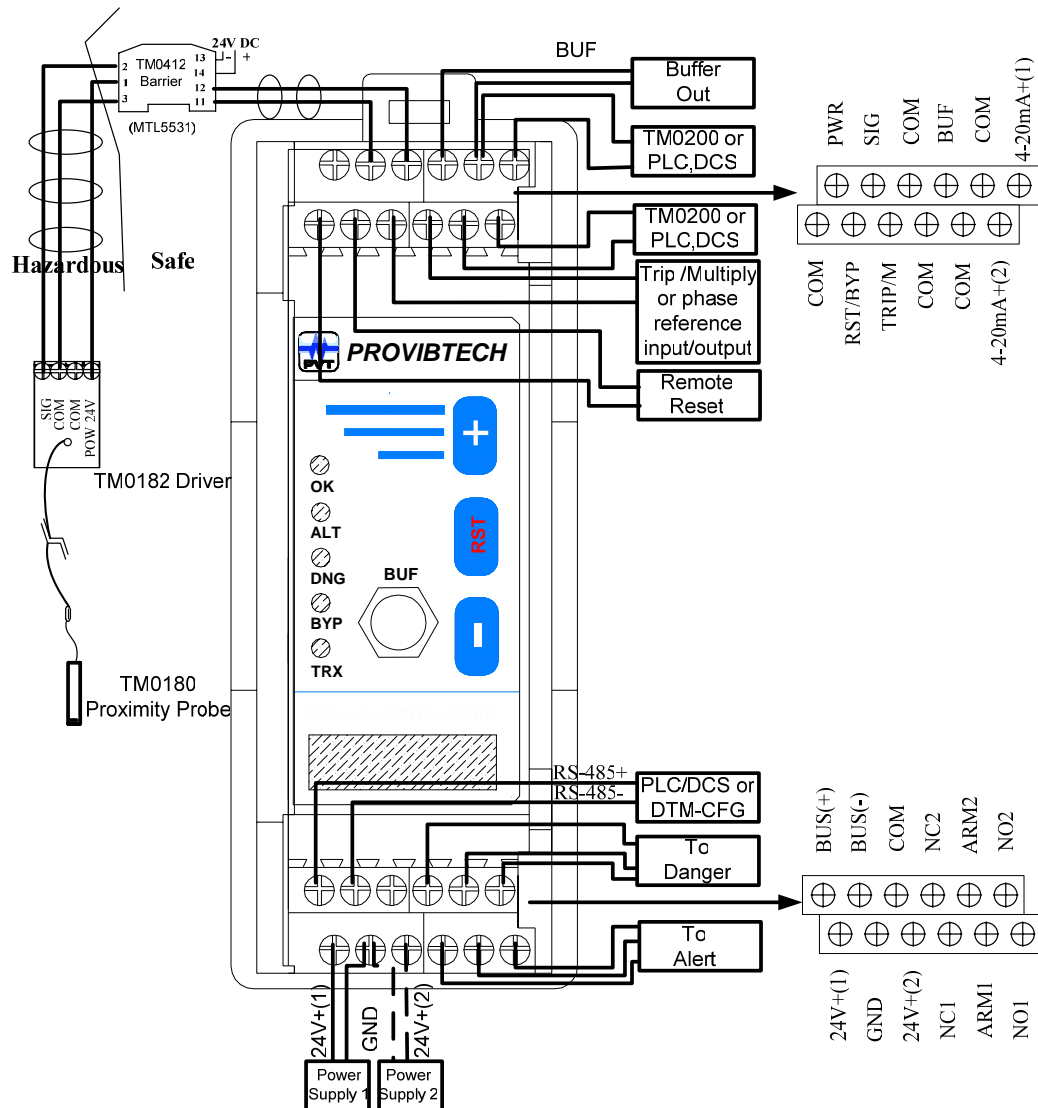
**Note:**

- ✓ Power supply 2 and 4-20mA(2) are optional outputs 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.



# DTM Distributed Transmitter Monitor

## DTM10-201/202/501 Hazardous Area Field-Wiring Diagram



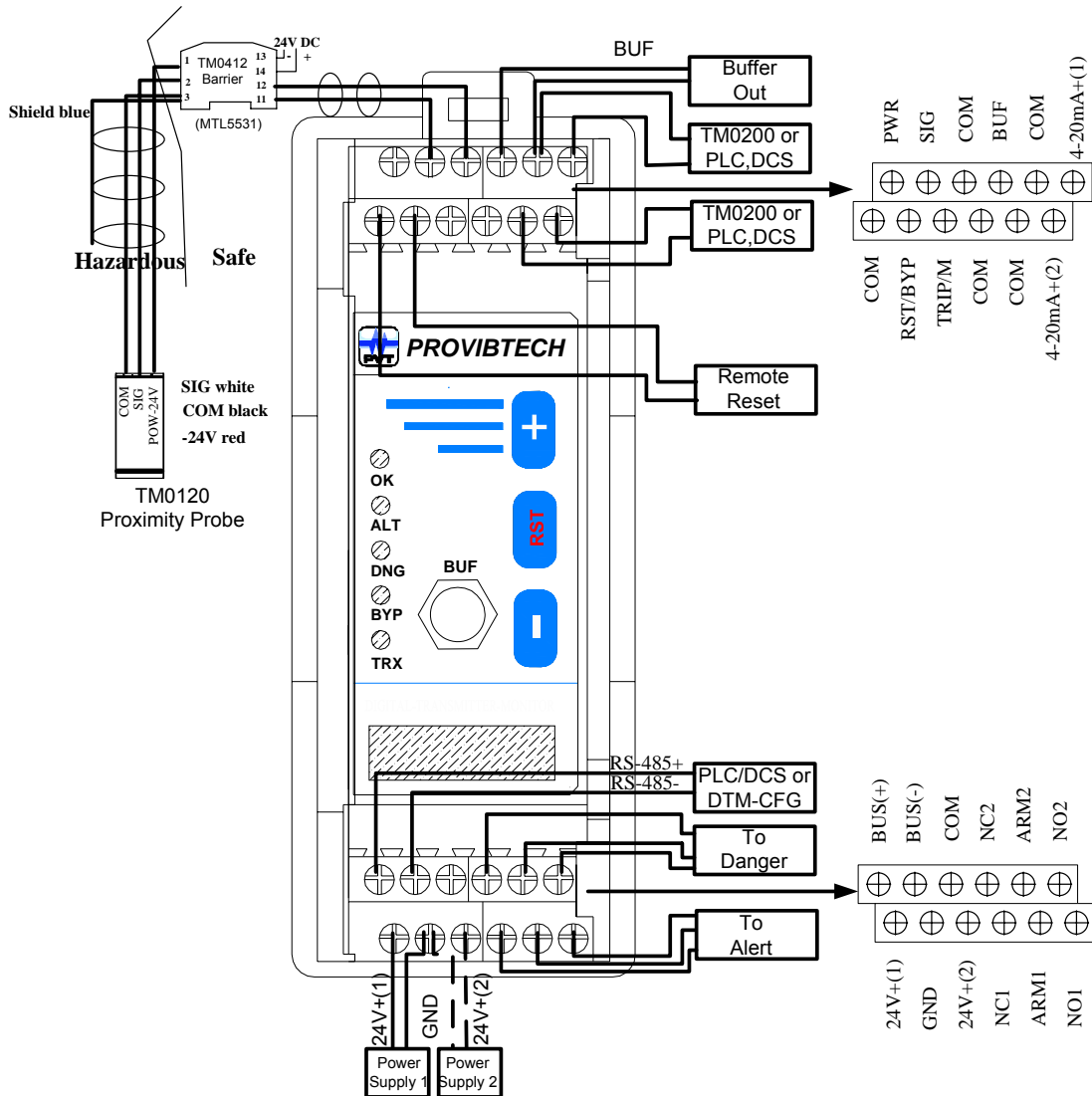
### Note:

- ✓ Power supply 2 and 4-20mA(2) are optional outputs 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 the DTM10-201 has the digital condition monitoring function, the Trip/Multi and COM pins are used for phase reference input. Moreover, the DTM10-201 won't provide Multiply Alarm function anymore, so you should set Multiply Alarm property to "None" by DTM-CFG software.
- ✓ If Full Scale of DTM10-501 is phase reference output for digital condition monitoring (A7), Trip/Multi terminal provides the phase reference signal for the DTM10-201, DTM10-301, DTM20-101 or DM200. A DTM10-501 can provide the phase reference signal for up to 6 DTMs or DM200s.
- ✓ Other barriers available:  
TM0414: (STAHL 9002/00-260-138-001)



# DTM Distributed Transmitter Monitor

## DTM10-202 Hazardous Area Field-Wiring Diagram (Interfacing with TM0120)



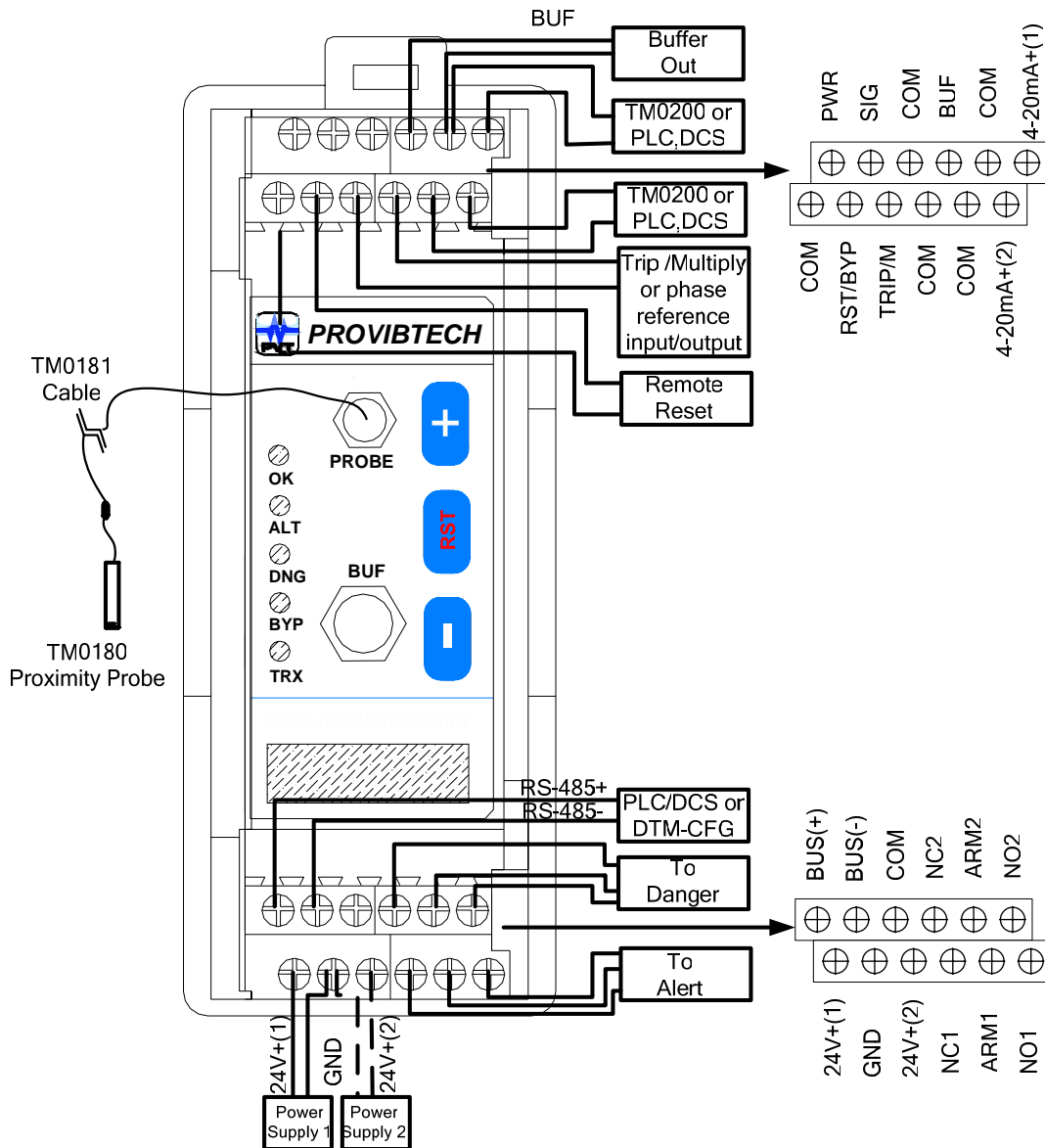
### Note:

- ✓ Power supply 2 and 4-20mA(2) are optional outputs 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.
- ✓ Other barriers available:  
TM0414: (STAHL 9002/00-260-138-001)



# DTM Distributed Transmitter Monitor

## DTM10-301/302/502 Field-Wiring Diagram



### Note:

- ✓ Power supply 2 and 4-20mA(2) are optional outputs 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 the DTM10-301 has the digital condition monitoring function, the Trip/Multi and COM pins are used for phase reference input. Moreover, the DTM10-301 won't provide Multiply Alarm function anymore, so you should set Multiply Alarm property to "None" by DTM-CFG software.
- ✓ If Full Scale of DTM10-502 is phase reference output (A6), Buffer output terminal will provide phase reference signal.
- ✓ If Full Scale of DTM10-502 is phase reference output for digital condition monitoring (A7), Trip/Multi terminal provides the phase reference signal for the DTM10-201, DTM10-301, DTM20-101 or DM200. A DTM10-502 can provide the phase reference signal for up to 6 DTMs or DM200s.