DTM10 Proximity Distributed Transmitter Monitor

(Radial Shaft Vibration, Thrust Position and Speed)

The DTM10 distributed vibration transmitter monitor provides a simple and cost-effective solution for monitoring critical and balance of plant equipment. The DTM 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 can interface with almost any proximity system (Proximity probe, extension cable and with or without probe driver). The DTM is fully digital and can be fully field-configurable or factory pre-configured.

Applications Include

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

DTM10 Fully Configurable by Software

- ✓ **Radial Vibration**
- ✓ **Thrust Position**
- ✓ **Speed**
- ✓ **Phase Reference**

DTM10 Features

- ✓ **Interface with any manufacturers' proximity probe system**
- ✓ **Works with or without probe driver**
- ✓ **Direct Modbus RTU interface**
- ✓ **Redundant 4-20mA outputs**
- ✓ **Redundant power supply inputs**
- ✓ **Isolation among power supply, signal input/ output and relay output**
- ✓ **Measures radial shaft vibration, thrust position, speed and phase reference**
- ✓ **Fully digital field-configurable**
- ✓ **Dual relay outputs (SPDT)**
- ✓ **LED indication of system OK, Alert, Danger, Bypass, and digital transmitting**
- ✓ **Local and remote RESET/BYPASS and Trip-multiply**
- ✓ **Buffered output for condition monitoring**
- ✓ **Aluminum case for RFI/EMC protection**

Specifications

Electrical

Power Supply:
   20-30VDC, 100mA
   Accepts dual power supply inputs

Frequency Response (±3dB):
   Normal frequency: 4 - 4.0 KHz
   Low frequency: 0.5 - 100Hz

Galvanic isolation:
   Among power, circuits and alarms

Proximity Probe Interface:
   Sensitivity:
      5mm and 8mm probe: 8 mV/um (200 mv/mil)
      11mm probe: 4 mv/um (100 mv/mil)
      25mm probe: 0.787 mv/um (20 mv/mil)
   Calibration:
      Requires two specifying probe systems for factory calibration.
      Field calibration with any manufacturers' 5mm, 8mm and 11mm probes is available with TM0540 or TM0541 proximity probe static calibrator.

Buffered Output:
   Original, un-filtered signal
   Impedance: 150Ω
   Maximum cable distance: 300m (1,000ft)
   Sensitivity: same as the sensor
   Local BNC connection
   Remote terminal connection
   For phase reference monitor, buffered outputs TTL compatible signal

Overall Vibration:
   Dual 4-20mA, source
   Maximum load resistance 500Ω

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: SPDT
   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: Shoring the connector pin RESET and COM will engage system reset and bypass

Trip-Multiply:
   Shorting the connector pin Trip Multi and COM will engage system alarm level increases to factory set levels

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

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
   Speed monitor or phase reference only monitor
   3 layers of password protection

Physical

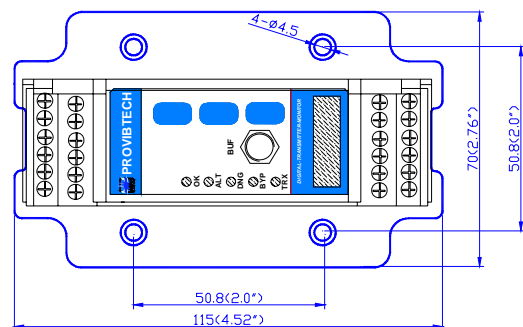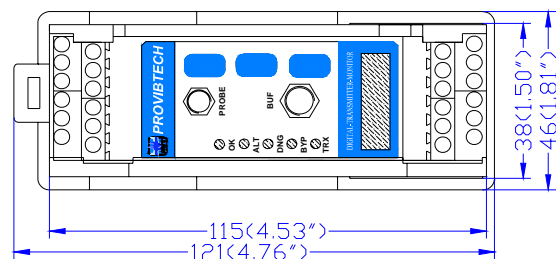Dimensions: Height: 75mm (2.95")
         Weight: 2.0lbs (1.0kg)

Plate Mounting

Rail Mounting

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 EMC compliance

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

ATEX lll 3G Ex nA ll T4

GOST R: 2ExnAIIT4X

Order Information

DTM10-AX-BX-CX-EXX-SX

Customer fully-configurable proximity DTM (requires DTM-CFG software)

AX: Alarm

A0: Dual alarms with epoxy sealed relays

A1: No alarm

BX: Mounting

B0: DIN rail mount

B1: Plate mount

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)

SX: Approvals

S0*: CE

S1: CE

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

ATEX lll 3G Ex nA ll T4

GOST R: 2ExnAIIT4X

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

Factory pre-configured for radial vibration (probe driver required)

AX: Full Scale

A0*: 0 - 200um pk-pk

A1: 0 - 1,000um 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 - 1,000um 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 mount

G1: Plate mount

IX: Frequency Response

I0*: Normal frequency

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

GOST R: 2ExnAIIT4X

DTM10-202- AX-CX-GX-SX

Factory pre-configured for axial (thrust) 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)

AX: Full Scale continued

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: Mount

G0*: DIN rail mount

G1: Plate mount

SX: Approvals

S0*: CE

S1: CE

CSA Class l, Div.2, Groups A, B, C & D, T4

ATEX lll 3G Ex nA ll T4

GOST R: 2ExnAIIT4X

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

Factory pre-configured for speed/ phase reference (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

CX: Alarms

C0*: Dual alarms with epoxy sealed relays

C1: No alarm

FXX: Teeth per Revolution

F01*: 1

FXX: Customer specifies, number of teeth =XX

GX: Mount

G0*: DIN rail mount

G1: Plate mount

SX: Approvals

S0*: CE

S1: CE

CSA Class l, Div.2, Groups A, B, C & D, T4

ATEX lll 3G Ex nA ll T4

GOST R: 2ExnAIIT4X

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

Factory pre-configured for radial shaft vibration (with 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 (not included)

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: Mount

G0*: DIN rail mount

G1: Plate mount

IX: Frequency Response

I0*: Normal frequency

I1: Low frequency (0.5-100Hz)

SX: Approvals

S0*: CE

S1: CE

CSA Class l, Div.2, Groups A, B, C & D, T4

ATEX lll 3G Ex nA ll T4

GOST R: 2ExnAIIT4X

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

Factory configured for axial (thrust) 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 (not included)

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: Mount

G0*: DIN rail mount

G1: Plate mount

SX: Approvals

S0*: CE

S1: CE
   CSA Class l, Div.2, Groups A, B, C & D, T4
   ATEX lll 3G Ex nA ll T4
   GOST R: 2ExnAlIT4X

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

Factory pre-configured for speed/ phase reference (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

CX: Alarms

C0*: Dual alarms with epoxy sealed relays

C1: No alarm

EXX: Probe and Cable (not included)

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 specifies number, number of teeth =XX

GX: Mount

G0*: DIN rail mount

G1: Plate mount

SX: Approvals

S0*: CE

S1: CE
   CSA Class l, Div.2, Groups A, B, C & D, T4
   ATEX lll 3G Ex nA ll T4
   GOST R: 2ExnAlIT4X

* Factory default

Optional Accessories

DTM-CAL

The DTM field calibration kit is capable of calibrating with 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 is capable of powering up to five DTM modules.

Probe systems

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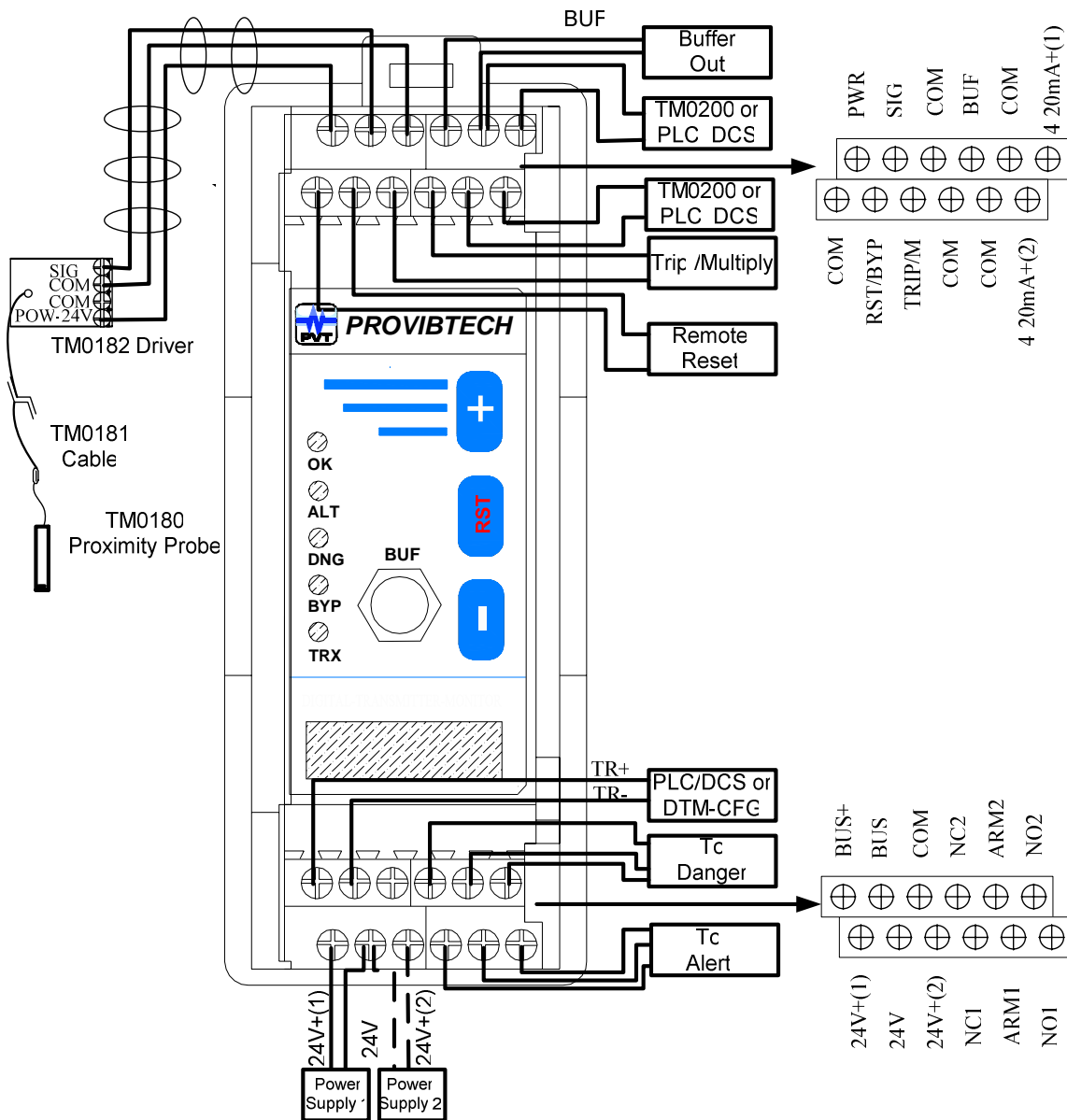- ✓ **TM0120:** 25mm probe system

TM0200

3-1/2 digit display unit. Requires 110VAC or 230VAC power input.
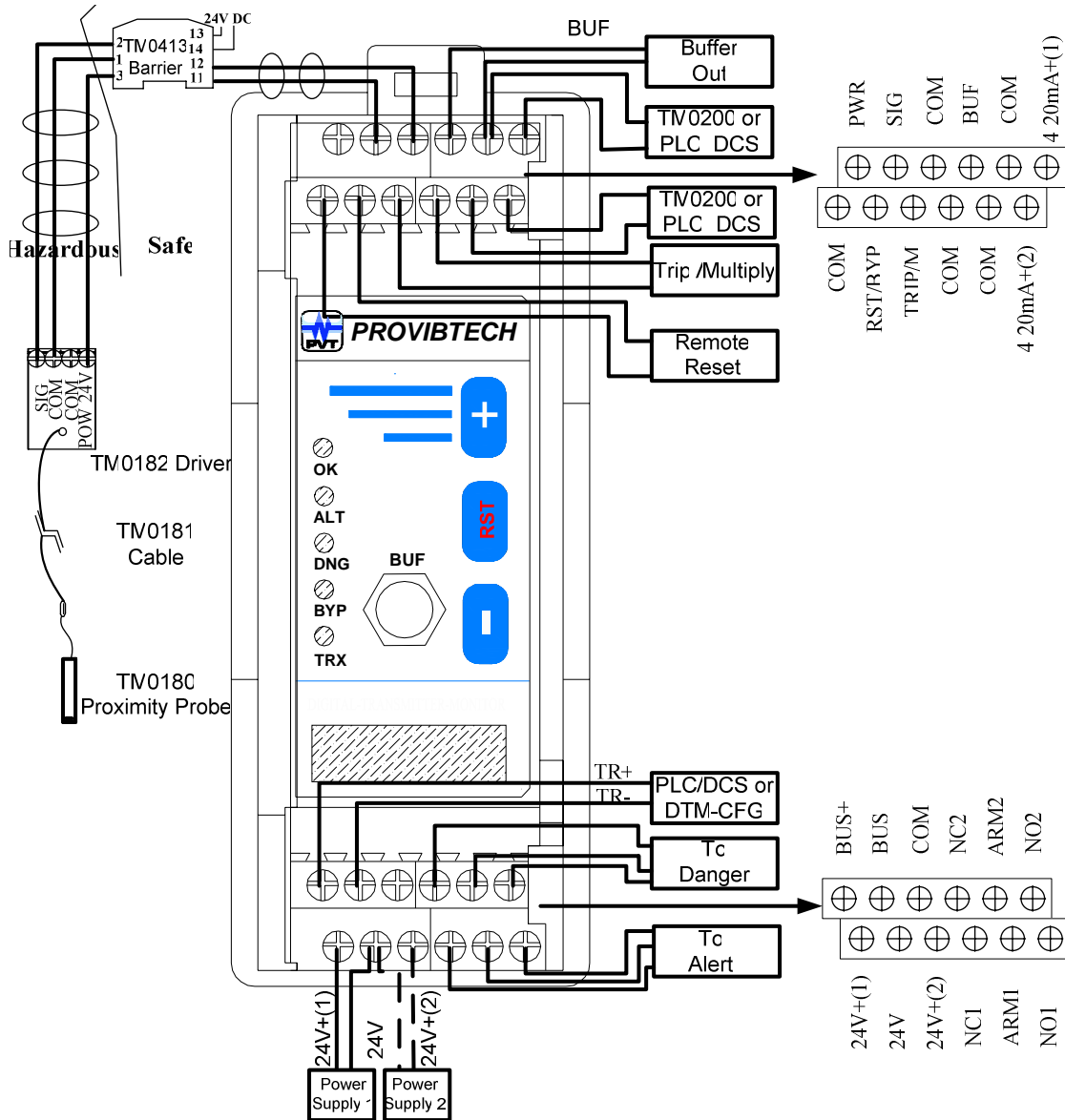
DTM10-201/202/501 Field-Wiring Diagram

Notes:

✓ 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

✓ DTM10 series is compatible with other manufacturers' probes, extension cables and probe drivers

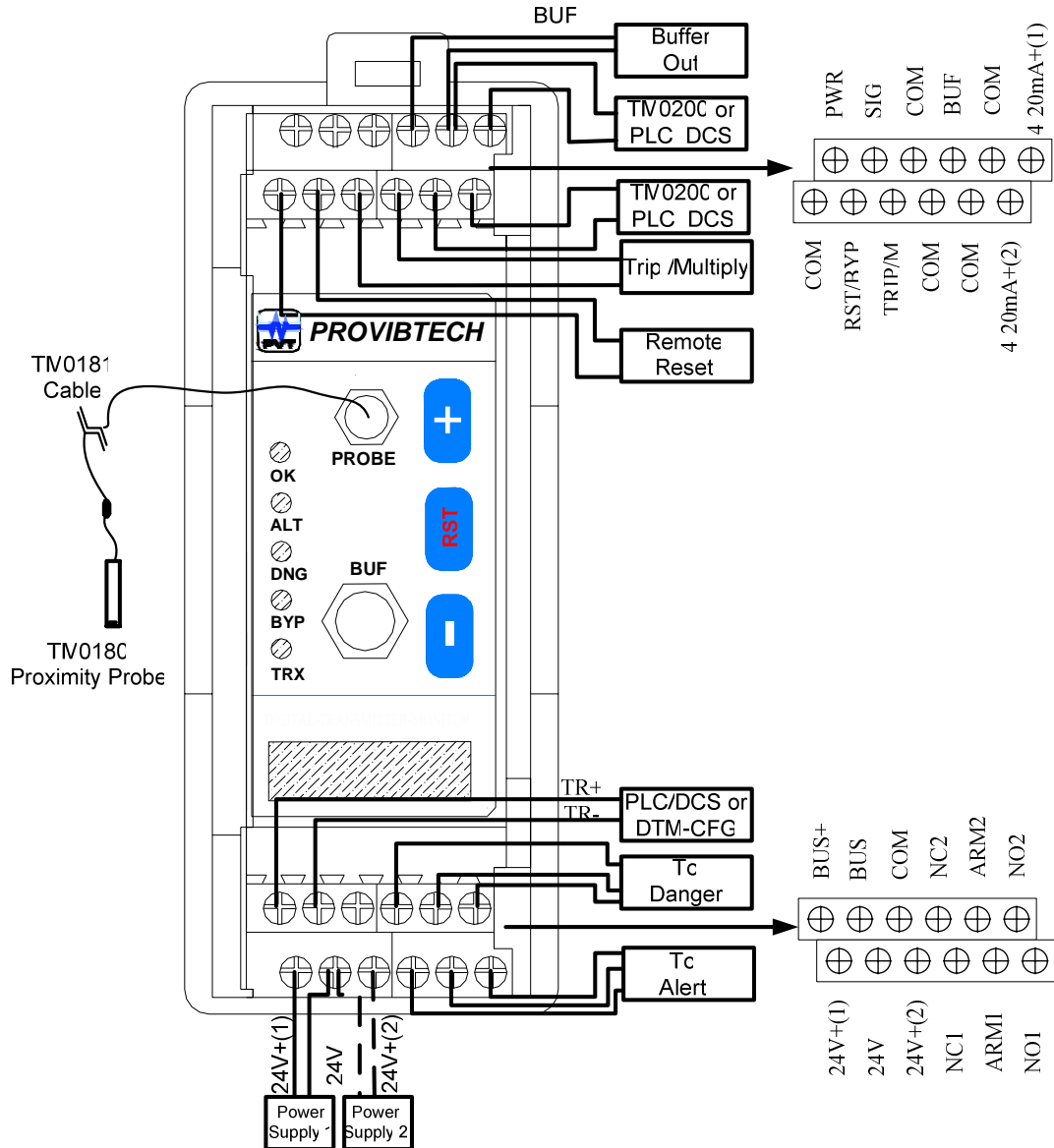## DTM10-201/202/501 Hazardous Area Field-Wiring Diagram

Notes:

- ✓ Power supply 2 is optional
- ✓ Alert and Danger relays are connected with 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.
- ✓ DTM10 series is compatible with other manufacturers' probes, extension cables and probe drivers.
- ✓ Other barriers available:
  TM0404: (MTL5042)
  TM0414: (STAHL 9002/00-260-138-001)

DTM10-301/302/502 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.
- ✓ DTM10 series is compatible with other manufacturers' probes, extension cables and probe drivers.