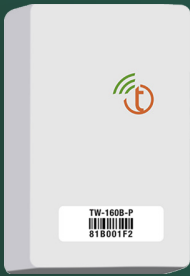**MDT**

Pulse Metering Data Transceiver

Standard and MAX Range Systems

Product Overview

The Tehama Pulse MDT records data from meters that generate a pulse output and transmits the totalizer count via radio towards the DCAP. It is compatible with nearly all water, gas and electric utility meters that use a reed switch or a piezoelectric pulse generator.

Our Pulse MDT is available in two radio technologies, our original Standard Range and our MAX Range System. The Standard Range is our original, first generation system, which we continue to fully support and maintain. Both are powered by two AA Lithium batteries with expected battery life up to eight years.

The Pulse MDT is also available with either a single pulse input for single meter usage or dual pulse inputs for co-located hot and cold water meters or other two-meter combinations.

Other variations and features are available such as:

- Top-of-the-hour synchronize Time of Use (ToU) with 15-minute interval data
- Submersible version for pit or outdoor installation (see Submersible Data sheet)
- Integrated Remote Display, California approved (See Display MDT Data sheet)

Specifications

Input	• Pulse signal from water, electric, gas, run-time, or BTU meters
MDT Data Storage	• Non-ToU: no local storage • ToU units: Over 2300 data pts. (24+ days @ 15 Min interval)
Data Resolution	• Non ToU: 1-hour interval • ToU: 15-minute interval, Top of the Hour synchronized
Max Pulse Rate	20 pulses per second, 25mS minimum pulse width
Radio	902 – 928 MHz; FCC and IC Certified for all modes • Standard: Open field range of one mile • MAX: Open field range approaching 10 miles
LED	Indicates on/off and RF network connection status. From button press: • Solid Green: good Link Quality • Solid Amber: OK Link Quality • Red or Flashing: poor Link Quality or syncing to Network
Operating Environment	-20 to 145 degrees F, up to 90% RH, non-condensing.
Power	Two AA Lithium batteries
Typical Battery Life	6-8 years @ 50 to 90 deg. F, reduced at temperature extremes
Dimensions	4.3" x 2.2" x 1.2"
Warranty	Five years. For more detailed information, please visit our warranty page. Note that the warranty does not cover batteries.

Continual product enhancements may cause specifications to change without notice.
*Actual range may vary depending on installation location and topography

Models

Standard System			
Single Pulse MDT	TW-160B-P	Single pulse input counter, one-hour interval data, no on-board memory	
Dual Pulse MDT	TW-160B-PP	Dual pulse input counter, one-hour interval data, no on-board memory	
Single Pulse MDT, Time-of-Use enabled	TW-160B-PT	Single Pulse input, 15-minute guaranteed (*) Time-of-Use interval data with on-board data memory. Readings are synchronized to the top of the hour for accurate billing.	
MAX System			
Single Pulse MDT	TW-170B-P	Single pulse input counter, one-hour interval data, no on-board memory	
Dual Pulse MDT	TW-170B-PP	Dual pulse input counter, one-hour interval data, no on-board memory	
Single Pulse MDT, Time-of-Use enabled	TW-170B-PT	Single Pulse input, 15-minute guaranteed (*) Time-of-Use interval data with on-board data memory. Readings are synchronized to the top of the hour for accurate billing.	

*: Adequate repeater coverage is required for guaranteed delivery.
Other combinations and sensor inputs are available by special order. Please contact Tehama for details.

Note Standard and MAX Range systems are NOT compatible: only Max Range MDTs must be used with a Max Range Repeater (and Max Range DCAP) and vice versa for Standard.

Refer to AN-119 in the documents section of our website for more information.

MDT Configuration

All MDTs come with a pre-set configuration; there are no settings to change on the MDT itself. Settings such as count factor or Units are set in our software.

New MDTs are shipped from the factory in a powered-off state. They can be powered on using a hidden button under the Tehama Wireless logo. The LED lights up when the button is pressed for visible feedback.

Turn ON or Off:

- Press & hold button until LED blips off (roughly 3 seconds), then release.

- A pulse input will also turn on an MDT.

Power-up LED Flashing at a 1 second rate:

- Indicates MDT / Repeater is listening for DCAP or other Repeaters.

- Once a beacon is heard, the flashing rate will double in speed.

- Once a Connection is established, the LED stays solid for 10 seconds.

- If the attempt to connect to all beacons fails, LED flashing stops after 60 seconds.

Check the status of an MDT or Repeater by tapping the button:

- Unit is OFF if you see 2 flashes after the button is released.

- Unit is Asleep (On but out of range) if you see 1 flash only. The button press will wake up the unit to try to re-connect to Network. Finding an MDT in the sleep state is usually an indication of poor placement or inadequate Repeater coverage.

- Unit is Connected and operating normally if the LED stays on for 10 seconds.

- Green indicates a robust radio link, Orange an OK link, and Red a poor link.

Reset Count:

- Press and hold button until power-up flashing sequence starts (12-15 seconds). The LED will blip off at the 3 second mark then go off for a few seconds at about 10 seconds.

MDT to Meter Wiring

Polarity Connection Concerns

Most Water & Gas Meters

The polarity does not matter for most Water and Gas meters which typically use a magnetic reed type switch.
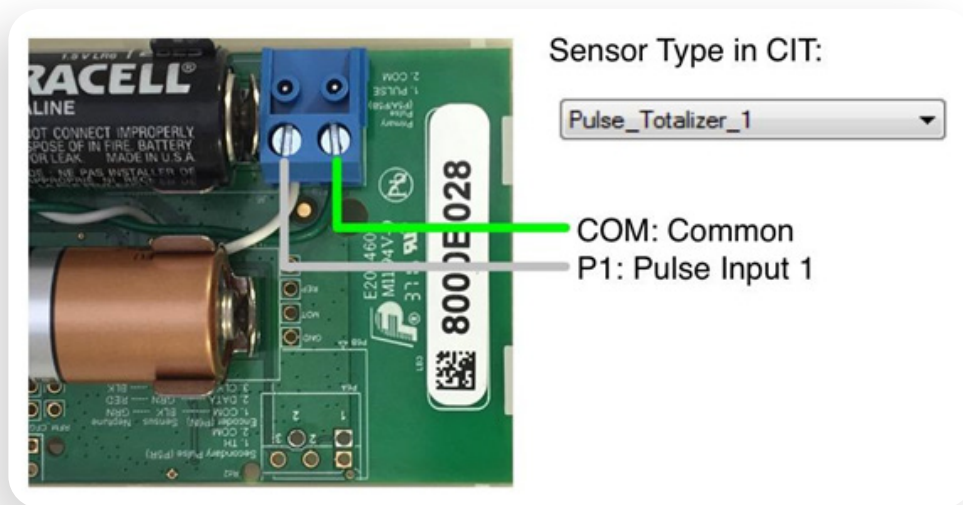
Electric Meters

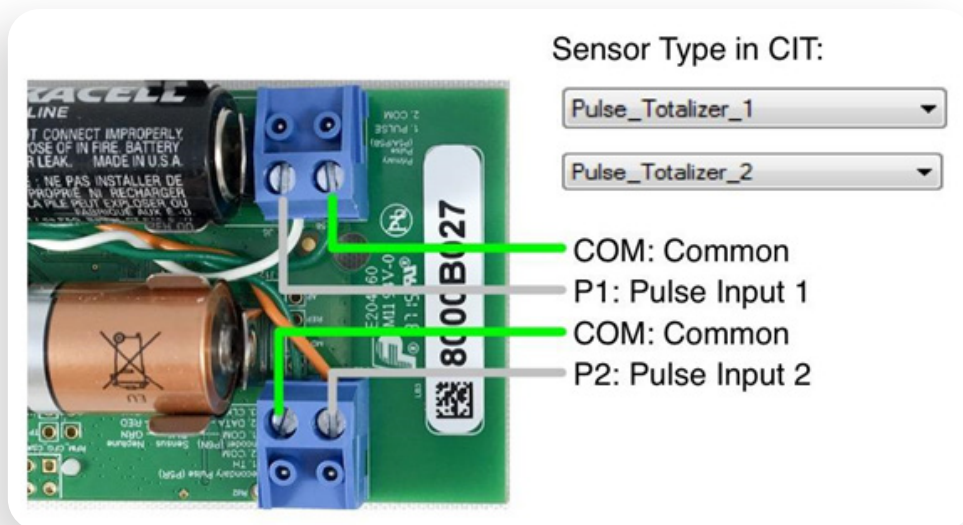The polarity is important for connecting to most Electric meters.

- The Pulse Input (P1 or P2) goes to the meter's pulse output terminal, labeled variously WH+, P1, "+", or ISOLATED OUTPUT 10/100/1000.

- The Common input goes to the common terminal, variously labeled ISOL COM, "-", or COM.

Wiring Guide

TW-160/170/180 B-P Single Pulse Input MDTs

TW-160/TW-170/180 B-PP Dual Pulse Input MDTs

Note that you can swap the Meter connectors and the polarity remains correct.

Device Placement

> **Warning:** All radio devices should be placed at least 8 inches (20 cm) away from people in order to minimize RF exposure.

With the DCAP Unit powered up, the repeater backbone should next be placed. Start with units closer to the DCAP and use the Repeater LED feedback indication to verify the range is acceptable. At first, just the minimum numbers of repeaters need be placed; however, it is necessary that they be within range (solid 10 second LED "flash" when button pushed) for the backbone to be reliable. Repeater to Repeater (or DCAP) range in open field scenarios is measured in miles for our MAX system, however building construction materials, terrain, and poor location choices can reduce this down to hundreds of feet or less.

Once the initial Repeater placement is complete, the MDT placement phase begins. Again, the LED feedback can be used to verify that MDTs are communicating with the network. Additional repeaters can be placed in areas where MDTs are unable to connect to the backbone. MDT to Repeater (or DCAP) range in open field scenarios is in excess of a mile for MAX, or roughly 2000 feet for Standard. Again building construction materials, terrain, and poor location choices can reduce this down to a hundred feet or less.

The CIT software can also be used in the placement phase to provide more detailed information such as Link Quality and Signal Strength readings generated by MDT and Repeaters.

Wiring Instructions

Units should never be placed directly on a metal surface or within a metal enclosure. Mounting on a metal surface will significantly affect the radio performance of the device, be it an MDT or a Repeater.

Recommended placement

- Mount on nearby wall away from meter and copper /metal piping or conduit.
- RF performance is best when mounted on wallboard.
- Use keyhole shape to mount on screw in wall.
- Designed for #6 Drywall screw.
- Separate case to tighten screw if desired.
- Note Antenna Pattern shown on the right.
- Radio signal slightly attenuated along the long axis of the MDT case.

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