

**MDT**

# Metering Data Transceiver with Runtime Measurement

Standard and MAX Range Systems

## Product Overview

The Tehama Wireless Runtime MDT records the "On" time in seconds of various distributed energy measurements. It comes in two versions, our Standard and MAX Range. The Standard Range is our original, first generation system, which we continue to fully support and maintain.

The running count is stored and transmitted to the DCAP once an hour. Versions of the Runtime MDT detect a 24VAC thermostat control state or a dry contact/relay switch input.

Optionally the unit can be ordered with an internal temperature sensor for ambient readings or external thermistor with the dry contact version. The thermostat version also detects the integrity of the connection and will generate an alert if the connection has been tampered with.

The unit is powered by two AA batteries providing a five to seven year battery life under normal conditions. An optional line powered variation is also available for the dry contact switch version.

The local MDT time base for time stamping data is driven by a highly accurate watch crystal and is regularly updated from the DCAP via the RF network.

## Specifications

|                       |   |
|-----------------------|---|
| Inputs Options        | <ul style="list-style-type: none"> <li>• 24 VAC zone value/thermostat control signals</li> <li>• Dry Contact (Relay) from control signal</li> <li>• Internal thermistor temperature sensor</li> <li>• External thermistor temperature sensor</li> </ul> |
| Data Resolution       | 1 hour reading and transmission interval  |
| Radio                 | Frequency: 902 – 928 MHz; FCC Certified<br>Standard (TW-160): 10mW, Open field range over 1 mile*<br>Max (TW-170): 80mW, Open Field range approaching 10 miles*   |
| LED                   | Bi-color LED Indicates on/off and RF network connection quality   |
| Operating Environment | -20 to 145 degree F, up to 90% RH, non-condensing.  |
| Power                 | <ul style="list-style-type: none"> <li>• Two AA Alkaline (standard)</li> <li>• Two AA Lithium (Optional, for sub-freezing temperatures)</li> <li>• 2.5 to 3.3V DC input (L3-RC versions)</li> </ul>   |
| Typical Battery Life  | 5 to 7 years @ 50° to 90° F, Reduced at extreme temperatures  |
| Dimensions            | 3.5" x 2.1" x 1.2"  |

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

## Models

| Standard System                                |  |  |
|--|--|--|
| 24VAC input Runtime MDT, Battery powered       | TW-160B-R<br>TW-160B-RI                  | -R: 24VAC thermostat control runtime counter, Counts number of seconds circuit is energized and circuit fault. 1-hr interval RF transmissions.<br>-RI: Adds internal temperature measurement   |
| Dry contact input Runtime MDT, Battery powered | TW-160B-RC<br>TW-160B-RCI<br>TW-160B-RCX | -RC: Relay control signal runtime counter. Counts number of seconds relay input is closed 1-hr interval RF transmissions.<br>-RCI: Adds internal temperature measurement<br>-RCX: Add external thermistor support (thermistor sold separately) |
| Dry contact input Runtime MDT, Line powered    | TW-160LC-RC(I)                           | Same functions as battery models but uses external DC 2.5 to 3.3V external power source  |
| MAX System                                     |  |  |
| 24VAC input Runtime MDT, Battery powered       | TW-170B-R<br>TW-170B-RI                  | -R: 24VAC thermostat control runtime counter, Counts number of seconds circuit is energized and circuit fault. 1-hr interval RF transmissions.<br>-RI: Adds internal temperature measurement   |
| Dry contact input Runtime MDT, Battery powered | TW-170B-RC<br>TW-170B-RCI<br>TW-170B-RCX | -RC: Relay control signal runtime counter. Counts number of seconds relay input is closed 1-hr interval RF transmissions.<br>-RCI: Adds internal temperature measurement<br>-RCX: Add external thermistor support (thermistor sold separately) |
| Dry contact input Runtime MDT, Line powered    | TW-170LC-RC(I)                           | Same functions as battery models but uses external DC 2.5 to 3.3V external power source  |

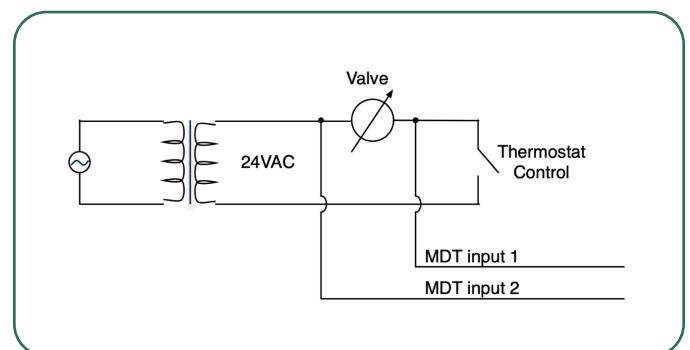
## Usage

The Runtime MDTs connect across the 24VAC terminals of a typical thermostat control signal, typically at the baseboard heating zone valve. Can also be connected at the thermostat across the 24VAC C (Common) signal and the W (White) control signal. The polarity of the connection does not matter. A typical wiring diagram is shown here:

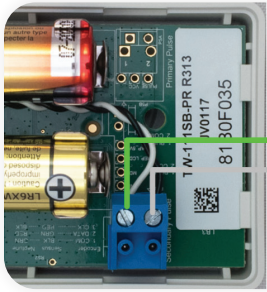
Whenever the thermostat energizes the valve, the MDT will increment a "Seconds" runtime counter. The units for the runtime count can easily be changed to Minutes or Hours from within the Tehama software using the count factor on the Sensor View -> General Configuration tab. For minutes enter 0.0166667 (1/60). For Hours enter .00027778 (1/3600).

The unit samples the circuit every 30 seconds and will stop or start counting if the circuit state has changed. The sampling will take place even if the MDT has been manually turned off. If a unit is off, but it detects the voltage associated with an active circuit, the MDT will turn on and begin to transmit its data every hour.

If an MDT is on and transmitting, but detects that it is no longer connected to an active circuit, it will send an indication of circuit break and the CIT will display Disconnected in the Runtime Count field.



## Wiring Instructions




Sensor Type in CIT:

COM: Runtime input 1  
 P1: Runtime Input 2

*Wiring order does NOT matter*

○ TW-160B-R and TW-170B-R, 24VAC Runtime version

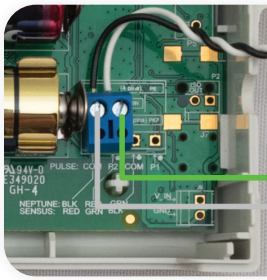


Sensor Type in CIT:

COM: Runtime input 1  
 P1: Runtime Input 2

*Wiring order does NOT matter*

○ TW-160B-RC and TW-170B-RC, dry contact/relay input Runtime version




Sensor Type in CIT:

P2: Runtime Input 1  
 COM: Runtime input 2

*Wiring order does NOT matter*

○ Wiring, TW-140B-R (Manufactured before Q4, 2016)

## Connector Specifications



**TW-160/170 Removable Connector Specs:**

Used on all TW-160/165 MDTs Pulse MDTs. Connector is compatible with other transmitters and some meters on the market.

|                             |                |
|-----------------------------|----------------|
| Wire size (solid/stranded): | 14 to 22 AWG   |
| Strip Length                | 1/4 inch (6mm) |
| Blade Type                  | 2.5mm Flat     |