Metering Data Transceiver with Runtime Measurement

Standard, MAX, and LoRaWAN Systems

tehama
wireless

Product Overview

The Tehama Wireless Runtime MDT records the "On" time in seconds of various distributed energy measurements. It comes in a few versions, our Standard, MAX Range and LoRaWAN. 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/Gateway 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.

Most MDTs are powered by two inexpensive field-replaceable AA batteries. 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/Gateway via the RF network.

Specifications

Inputs Options	• 24 VAC zone value/thermostat control signals • Dry Contact (Relay) from control signal • Internal thermistor temperature sensor • External thermistor temperature sensor
Data Resolution	1 hour reading and transmission interval
Radio	Frequency: 902 – 928 MHz; FCC Certified Standard (TW-160): 10mW, Open field range over 1 mile* MAX/LoRaWAN: 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	• Two AA Alkaline (standard) • Two AA Lithium (Optional, for sub-freezing temperatures) • 2.5 to 3.3V DC input (L3-RC versions)
Typical Battery Life	6-8 years @ 50 to 90 deg. F, reduced at temperature extremes
Dimensions	3.5" x 2.1" 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		
24VAC input Runtime MDT, Battery powered	TW-160B-R TW-160B-RI	-R: 24VAC thermostat control runtime counter, Counts number of seconds circuit is energized and circuit fault. 1-hr interval RF transmissions. -RI: Adds internal temperature measurement
Dry contact input Runtime MDT, Battery powered	TW-160B-RC TW-160B-RCI TW-160B-RCX	-RC: Relay control signal runtime counter. Counts number of seconds relay input is closed 1-hr interval RF transmissions. -RCI: Adds internal temperature measurement -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 TW-170B-RI	-R: 24VAC thermostat control runtime counter, Counts number of seconds circuit is energized and circuit fault. 1-hr interval RF transmissions. -RI: Adds internal temperature measurement
Dry contact input Runtime MDT, Battery powered	TW-170B-RC TW-170B-RCI TW-170B-RCX	-RC: Relay control signal runtime counter. Counts number of seconds relay input is closed 1-hr interval RF transmissions. -RCI: Adds internal temperature measurement -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
LoRaWAN System		
24VAC input Runtime MDT, Battery powered	TW-180B-R TW-180B-RI	-R: 24VAC thermostat control runtime counter, Counts number of seconds circuit is energized and circuit fault. 1-hr interval RF transmissions. -RI: Adds internal temperature measurement
Dry contact input Runtime MDT, Battery powered	TW-180B-RC TW-180B-RCI TW-180B-RCX	-RC: Relay control signal runtime counter. Counts number of seconds relay input is closed 1-hr interval RF transmissions. -RCI: Adds internal temperature measurement -RCX: Add external thermistor support (thermistor sold separately)
Dry contact input Runtime MDT, Line powered	TW-180LC-RC(I)	Same functions as battery models but uses external DC 2.5 to 3.3V external power source

* Adequate Repeater/Gateway coverage is required for guaranteed delivery.
** Extra cloud storage fees required
Other combinations and sensor inputs are available by special order. Please contact Tehama for details.

Note Standard, MAX, and LoRaWAN products are NOT compatible with each other. MAX MDTs must be used with MAX Repeaters and DCAPs; likewise for Standard. LoRaWAN uses Gateways.

Refer to AN-119 for more information. Also available in the Support/Documents section of our website.

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 easy 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.
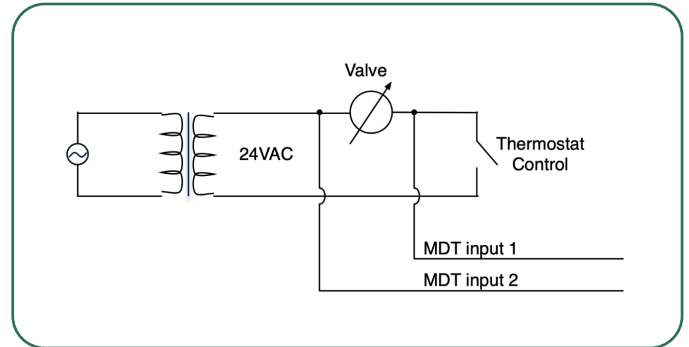
Wiring Instructions

Sensor Type in CIT:

RunTime_Counter ▾

COM: Runtime input 1
P1: Runtime Input 2

Wiring order does NOT matter

TW-160B-R, TW-170B-R & TW-180B-R, 24VAC Runtime version
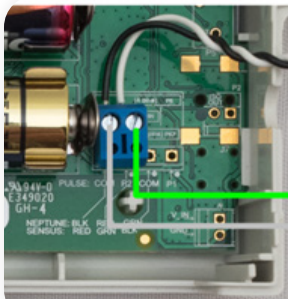

Sensor Type in CIT:

RunTime_P1 ▾

COM: Runtime input 1
P1: Runtime Input 2

Wiring order does NOT matter

TW-160B-RC, TW-170B-RC & TW-180B-RC dry contact/relay input Runtime version

Sensor Type in CIT:

RunTime_Counter ▾

P2: Runtime Input 1
COM: Runtime input 2

Wiring order does NOT matter

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

Connector Specifications

TW-160/170/180 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