How to Replace LCDT with TTD

Please read the Installation & Operation manual for the TTD. This will familiarize you with the new features and configurability available in the TTD.

Certification

In this LCDT replacement configuration, the TTD will not carry a NEMA 4 rating due to the mounting stud removal mentioned in the installation section below.

Hazardous Area Classification

The TTD has CSA Class I, Division 2, Groups B, C and D approval. This differs from LCDT which has CSA Class I, Division 1, Group D approval. Consult with your AHJ for a review of classification for the area where the LCDT is installed for verification that it may fit into Class I, Division 2 classification.

Installation

1. The TTD-2 model (part # 50700601) offers exact drop-in replacement option for both models of LCDT-NO and LCDT-NC.
   a. Systems powered by 12- or 24-VDC (battery powered) or CD negative ground ignition are fully compatible.
   b. Systems powered by 120-VAC line voltage will require a 24-VDC power supply installed to power the TTD.
   c. CD positive ground ignition systems are not supported by TTD.

2. This guideline is for typical installations with fuel valve, ignition and power input connection changes and are meant to supplement the TTD installation diagram 50-08-0718.
   a. Refer to the drawing in the TTD Installation & Operation manual for clarification on your specific installation.
   b. To find all information about TTD features and options as well as the downloadable installation & operations manual, go to https://www.fwmurphy.com/products/controllers/ttd.

3. Mount the TTD head.
   a. Only three (3) of the TTD mounting studs are used to mount to the original LCDT mounting holes.

LCDT mounting holes circled
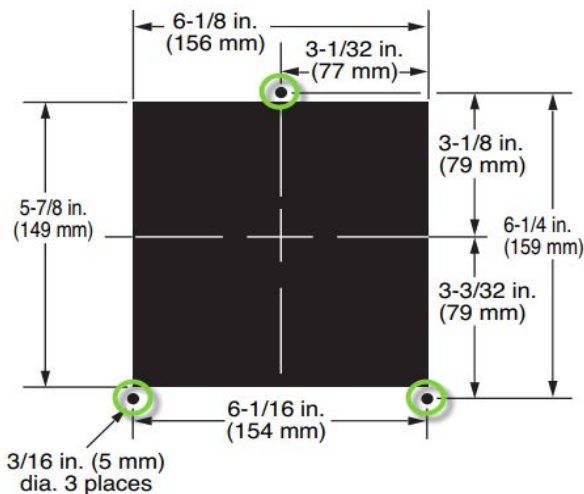
b. On the TTD, remove the mounting studs (5) circled below. Use pliers to turn them counterclockwise to unscrew from the bezel. Removing studs in this matter will not affect warranty of the TTD.
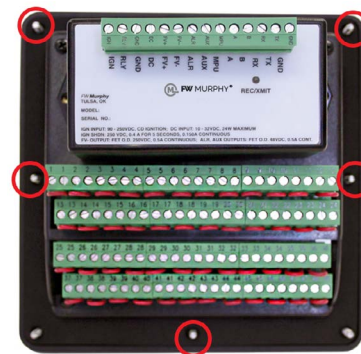
Remove the circled TTD mounting studs.

c. Align the TTD studs with the 2 bottom holes and insert into the LCDT opening. They will fit into the old holes. The top center stud will be on the top edge of the cutout.

d. Install a star nut on the bottom studs first, then on the top center stud. The top center nut will catch the edge of the sub panel plate as shown below. For vibration or stability concerns a 5/32" x 7/8" stainless fender washer is recommended.

e. Tighten the three 5/16" star nuts to 9 in. lbs. (1 Nm).
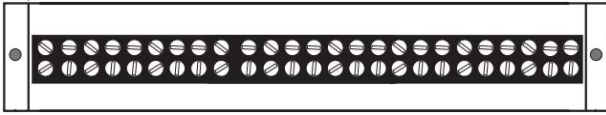

Fender washer with star nut on top stud (option)

5/16" star nuts on three studs

4. Connect the Sensor Wiring for NO or NC.

   a. **For Normally Open:** Remove the LCDT-TB-NO from the panel.

     i. Single wire normally open, (ground to shutdown) sensors will be wired to the matching sensor channel on the TTD.

     ii. Leave the factory-installed jumper installed across matching TTD terminals, and terminate the sensor wire to either of the matching terminals on the TTD.
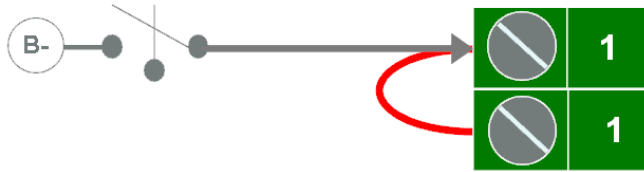
Normally open sensor wiring to TTD (typical)

   b. **For Normally Closed:** Remove the LCDT-TB-NO from the panel.
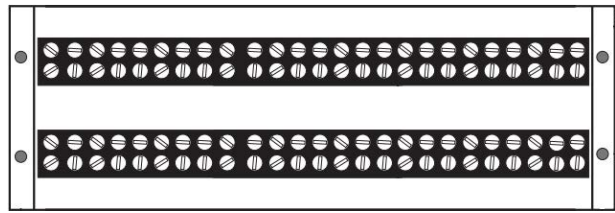
     i. Two wire normally closed sensors will be wired to the matching sensor channel terminals on the TTD.

     ii. Remove the factory-installed jumper installed across matching TTD terminals and insert one wire into each of the matching terminals on the TTD.

Normally closed sensor wiring to TTD (typical)

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5. Connect the power supply wiring.

   a. The LCDT power supply will not be used, but the explosion-proof enclosure may be used as a junction box to extend wiring to the TTD.

   b. Extend the wires located inside the power supply enclosure and re-route up to the TTD mounted inside the enclosure.

   c. Follow the wiring changes as applicable, LCDT-PS-CD-N CD ignition powered wiring changes to new TTD.

LCDT-PS-120/24/12

| CD Ignition Powered Wiring Changes (LCDT-PS-CD-N to New TTD)		
LCDT Terminal	Description	New TTD Terminal
1 (IGN)	Ignition (power)	IGN (IGN SD)
2 (FV+)	Fuel valve coil +	FV+
3 (FV-)	Fuel valve coil -	FV-
4 (GND)	Chassis ground	GND
5 (NO)	Shutdown Alarm Relay Normally Open (to run)	ALR***
6 (Com)	Shutdown Alarm Relay Common	
7 (NC)	Shutdown Alarm Relay Normally Closed (to run)	
***TTD does not have a dry contact for the shutdown alarm but will ground the ALR terminal through internal solid state FET when a shut-down alarm occurs.		

d. Follow the wiring changes as applicable, LCDT-PS-120/24/12 DC powered wiring changes to new TTD.

DC Powered Wiring Changes (LCDT-PS-120/24/12 to New TTD)		
LCDT Terminal	Description	New TTD Terminal
1 (C)	Ignition relay common	Not available
2 (NO)	Ignition relay normally open	IGN*
3 (C)	Fuel relay common	FV-**
4 (NO)	Fuel relay normally open	FV+**
5 (C1)	Shutdown Alarm Relay Normally Open (to run)	ALR***
6 (NC1)	Shutdown Alarm Relay Common	
7 (NO1)	Shutdown Alarm Relay Normally Closed (to run)	ALR***
8 (+)	DC+ power input	DC
9 (-)	DC- power input	GND
10 (GRD)	Ground	GND
11 (N)	120 VAC power input	Not available
12 (H)	120 VAC power input	Not available
*TTD does not have a dry contact for ignition but will ground the IGN terminal to stop the equipment through internal solid state FET. Behavior of the IGN terminal is configurable for open to GND to run or closed to GND to run. ** TTD does not have a dry contact for fuel valve. Verify Fuel valve wiring against wiring guidelines shown in TTD Installation & Operation Manual. Behavior of the FV- terminal is configurable for open to GND to run or closed to GND to run. ***TTD does not have a dry contact for the shutdown alarm but will ground the ALR terminal through internal solid state FET when a shut-down alarm occurs.		

e. Follow the wiring diagrams for the TTD as needed.
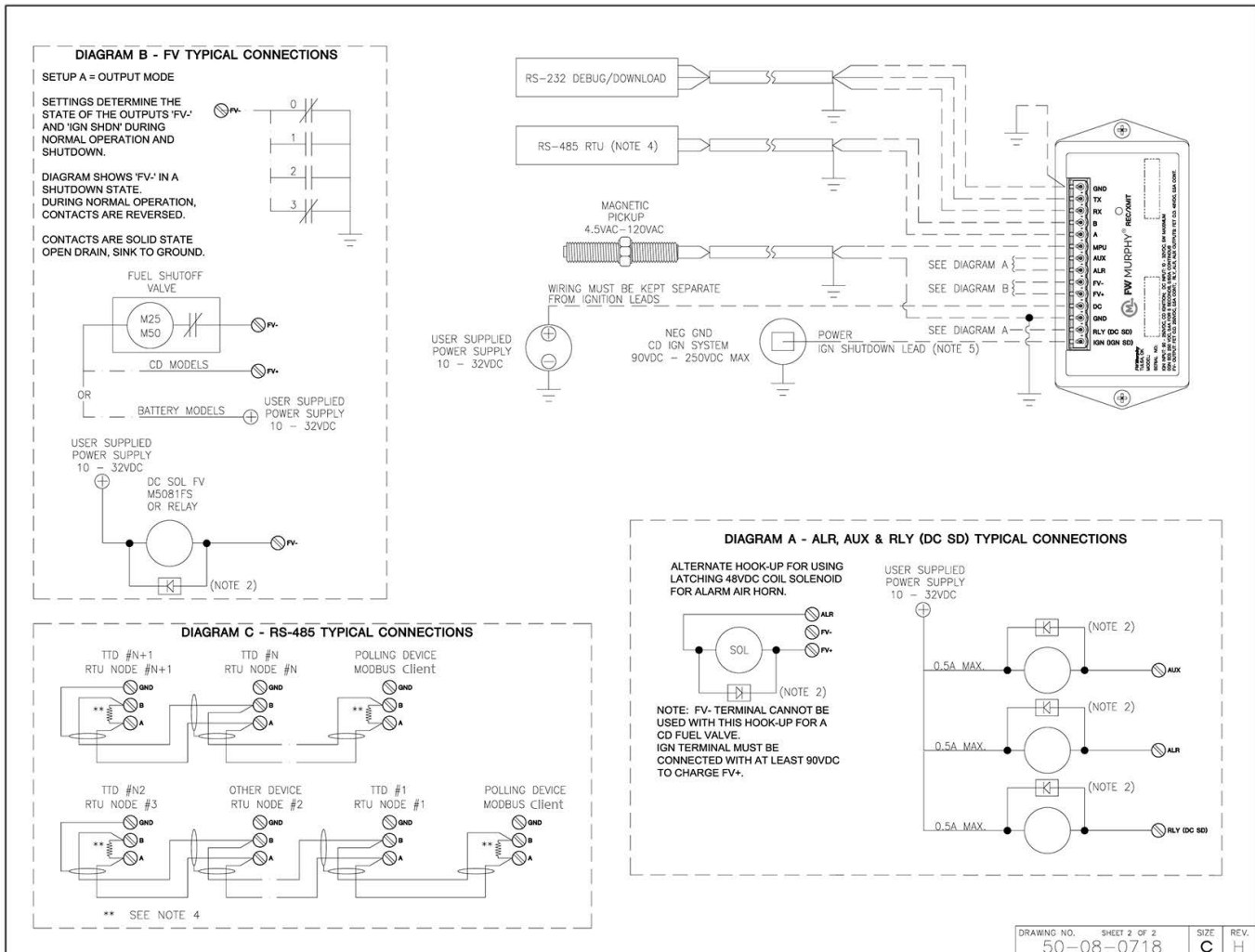
6. Post installation steps TTD setup checks.

   a. To setup the desired startup B1 lockout time, press and hold Setup/Enter key to access the Timer (Setup #1) menu. This menu also has the ignition ground delay to burn unspent fuel. If eyelets E1 and E2 are missing in the LCDT power supply, then there should be a 3-5 second time entered for Timer 4 in the menu for Ignition Ground delay.

   b. To emulate the input channel setup map of the LCDT, press and hold Setup/Enter key to access the Sensor Mode (Setup #2) menu and select that option as 4 or 5 as needed for the application.

	Template Settings		B1 Lockout	B2 Lockout	Class A	Class C	Over-speed	Remote Reset	Remote Lockout	Local ESD	Remote ESD
0	Only when SETUP 2 is set to 0 can individual channels be set in SETUP 3										
1	TTD	Default	N/A	N/A	(1-46)	N/A	N/A	(45*)	(46*)	(47**)	(45**)
2	TTD	MARK II	8 (16-23)	N/A	32 (1-15, 24-40)	4 (41-44)	N/A	(45*)	(46*)	(47**)	(45**)
3	TTD	MARK III	9 (1-9)	N/A	31 (10-30, 32-40, 48)	4 (41-44)	N/A	(45*)	(46*)	(47**)	(45**)
4	TTD	MARK IV, LCDT	15 (1-15)	N/A	25 (16-40)	N/A	N/A	(45*)	(46*)	(47**)	(45**)
5	TTD	MARK IV, LCDT +	15 (1-15)	N/A	25 (16-40)	4 (41-44)	N/A	(45*)	(46*)	(47**)	(45**)
6	TTD	Generic	16 (1-16)	4 (17-20)	20 (21-40)	4 (41-44)	N/A	(45*)	(46*)	(47**)	(45**)
20	DD-20	Altronic	8 (10-17)	N/A	11 (20-27, 30-32)	N/A	N/A	(45*)	(46*)	N/A	N/A
40	DD-40	Altronic	16 (10-17, 0-27)	N/A	21 (30-37, 40-47, 1-8)	N/A	N/A	(45*)	(46*)	N/A	N/A

   c. Use Setup #5 to preset the package's run-hourmeter.

   d. Use Setup #A to set the behavior of the Ignition and Fuel Valve outputs. Mode 0 will emulate the behavior of the Ignition and Fuel valve operation of open to ground to run, closed to ground to stop like the LCDT. Mode 0 will emulate the behavior of the Ignition and Fuel valve operation of open to ground to run, closed to ground to stop like the LCDT.