

# TTD™ Series Configurable Fault Annunciator



## Features

- Fully-Configurable Fault Annunciator
- Alarm and Shutdown Control System for Engine-Driven Pumps and Compressors
- Monitors 48, User-Configurable, Sensor Inputs From N.O. and/or N.C. Censors
- User Selectable Templates Provide Ease of Retrofit by Selecting Configuration of Existing Annunciators via Display Keypad or Download From Computer With Windows Based MConfig® Installed.
- Intuitive Icons Display Status and Operating Mode for Ease of User Operation.
- Serial Communications Port with Selectable Baud Rates up to 38,400
- Universal Power Supplies Powered by 12/24VDC or CD Ignition (Neg. Ground).
- CSA Class I, Division 2, Groups B, C, and D.
- Optional Tachometer Function with Overspeed and Underspeed Protection Using CD Ignition or Magnetic Pickup Input.
- Optional Prelube and Postlube Functionality.
- Optional lubricator No-Flow Detection for up to 4 Proximity Switches.
- One Display Head is Common to all Configurations Allowing Fewer Spare Parts Required to be Maintained in the Field.
- Internal Monitoring of DC Supply, CD Ignition, and Internal Battery Voltage

The TTD product is a solid-state fault annunciator and shutdown control system designed to protect engines, pumps, compressors and their associated equipment. The TTD model will accept 48 sensor inputs from normally open and/or normally closed sensors. Each of the 48 inputs can be configured for "Shutdown" or "Alarm Only". Any input can be locked out by one of the two Start-Run timers, or configured as Class C, ESD or Ignore. The annunciator provides for both closing of a fuel valve and grounding of an ignition after a time delay.

Incorporated in the TTD non-volatile memory:

- Run Hours/Elapsed Time Meter
- Last 10 Shutdowns with associated run hours
- Last 4 Alarms with associated run hours
- Selectable Modbus RTU slave RS232/RS485 serial communications
- Selectable baud rates

## Optional Features:

- Pre/Post lube timed functionality (hours roll over at 99,999)
- Tachometer w/ Overspeed and Underspeed setpoints and running hours.
- Lubricator No-Flow detection for up to 4 proximity switches.

## The TTD Annunciator Has Two Separate Components:

### Display Head

The Display Head displays operational and configuration data. Configuration parameters are entered via keypad or downloaded from MConfig software. The Display Head will accept digital inputs directly on the back of the unit. Power is provided to the Display Head via a direct Phoenix connector or a cable connecting to a remote mounted power supply. The Display Head contains the microprocessor, the Liquid Crystal Display (LCD), the membrane keys for configuring the sensors inputs and the sensor input terminal blocks.

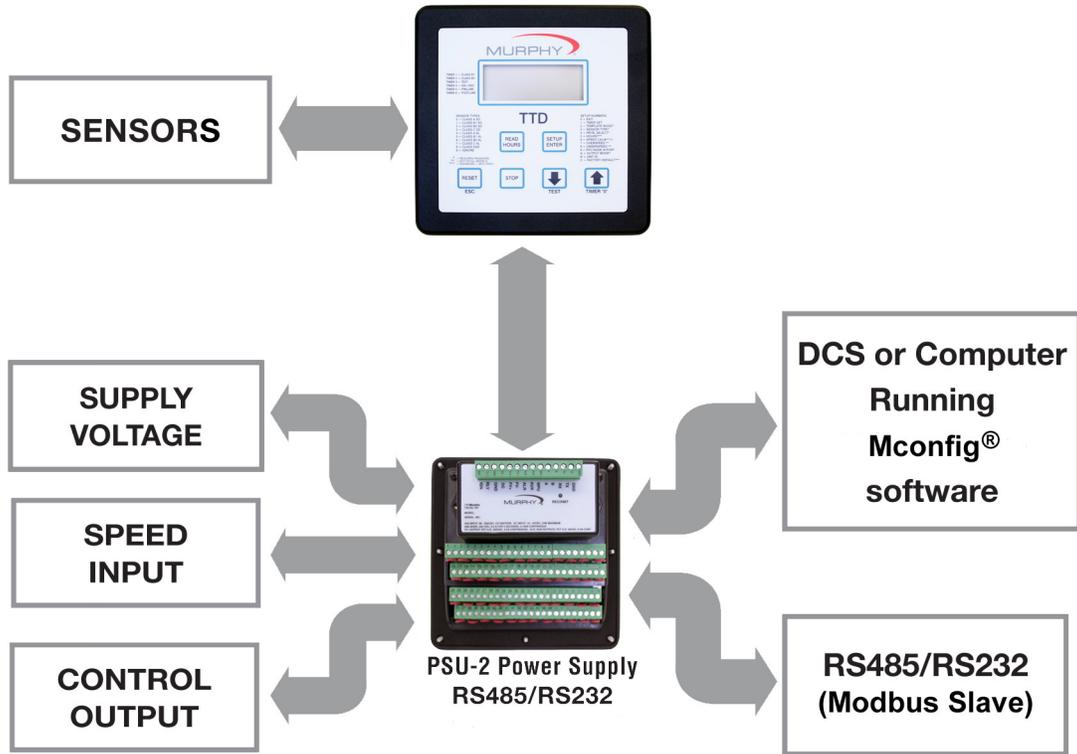
The TTD liquid crystal display annunciates any fault from the sensor inputs, displays engine speed, and run hours/elapsed time meter. Other features for the TTD are: built-in "Test Mode" function to test the sensor circuits without causing a fault shutdown, Pre-lubrication and Post-lubrication timers, and on-board backup battery to retain the fault display after shutdown on ignition powered units.

### Power Supply

The Power Input and Control Output Terminals are mounted on the Plug-in Power Supply (PSU-2) or other Modbus RTU Master devices. Power Supplies also include an RS485/RS232 serial communication port (MODBUS RTU slave) to interface with micro-controllers, PC's, PLC's, and/or communication and control systems. The serial communication provides read and write register capability and selectable baud rate up to 38,400.

All Power Supply models are reverse polarity protected and can be powered by 10-32vdc or 90- 400vdc negative ground CD ignition. The TTD annunciator is fully operable with the internal battery; the external DC power enables communications support (Modbus slave) and turns on the display backlight.

# TTD System



## TTD-H Display Head



Normal Operation Display  
(yellow background\*)



Shutdown/Warning Display  
(red background\*)

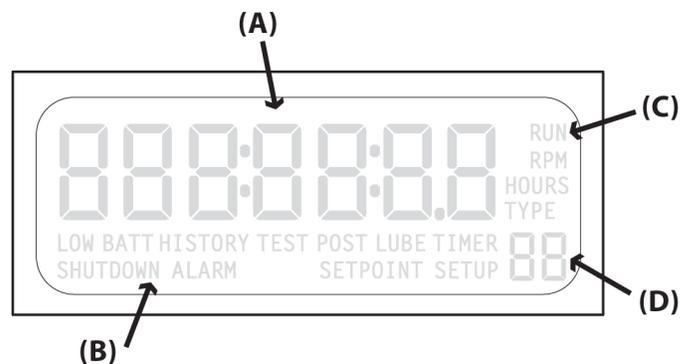


Back View w/PSU-2

### TTD Intuitive Display Icons

The TTD system features a static LCD display (A) with backlight (external DC is required). The applicable icon and number (B, C and D) will be displayed to clarify the display readings or alert the operator to an operating condition.

\* When powered by DC source.



## Specifications

### Power Requirements:

**PSU-2:** 10-32VDC, 10W (max); 90-400VDC CD Ignition, 750uA @ 100VDC (max)

**On-Board Backup Power:** Lithium battery, 6 VDC, 1300 mAh.

**Digital Inputs:** 48 (a.k.a. Channels)

**Sensor Types:** Discrete Input, N.O./N.C., intrinsically safe (with use of PSU-1) or non-incendive (with use of PSU-2)

### Magnetic Pickup Input:

**One Magnetic Pickup Sensor Input:** 3.6 - 120 VAC, 2-10 kHz.

### Outputs:

**IGN:** 0.4A @ 400VDC\* for 5 seconds  
0.15A @ 400VDC(\*) cont. duty

**RLY:** 0.5A @ 48VDC cont. duty

**FV-:** 0.5A @ 400VDC(\*) cont. duty

**ALR:** 0.5A @ 48VDC cont. duty

**AUX:** 0.5A @ 48VDC cont. duty

### Operator Interface:

**Display Type:** LCD, Static, 80 segment, custom text with LED Backlight

**Display Viewable Area:** ~ 2.79 x 1 in. (71.04mm x 25.4mm)

**Display Contrast:** Automatic

**Display Backlight:** Yellow (Normal Operation); Red (Shutdown) (Backlight will only be available when unit is powered by DC or AC.)

**Voltage Level Monitor:** Monitor and display voltage level of DC Supply, CD Ignition, and internal battery.

**Keypad:** 6 switches: Ridge Embossed, Metal Dome, Tactile 14 Oz. Trip Force

**Enclosure Cutout:** 5.50 x 5.50 inches (133 mm).

**Operating Temperature:** -40 to +85 degrees C

**Viewable Temperature:** -40 to +85 degrees C

**Storage Temperature:** -40 to +85 degrees C

**Tachometer Accuracy:** ±0.5% of the display reading or ±1 RPM, whichever is greater.

**Resettable Hourmeter Range:** 0 to 99999 hrs.

**Non-Resettable Hourmeter Range:** 0 to 99999 hrs.

\* CSA approved for 250VDC maximum

**Hourmeter Accuracy:** ±1 hour per year.

### Communication Ports: 1

A single bi-color (GREEN/RED) LED is provided to give visual indication of active transmit and receive traffic. Only one connection will be active at any time.

**Interface:** Factory configured for RS485; field-selectable for 3-wire RS232 or RS485.

**Baud/Stop Bit Selections:** 9600, 19.2K, 38.4K<sup>†</sup>; N,8,1; N,8,2

**Protocol:** Modbus RTU

**Connection:** There are 2 screw terminal connectors for RS485. There are 2 screw terminal connectors for RS232. There is 1 screw terminal common for both ports labeled as GND.

### Third Party Approvals:

TTD-H, PSU-2: CSA Class I, Division 2, Groups B, C, and D.

TTD-H: IEC 60529 - IP66 (NEMA 4 & 4X equivalent)

### Intuitive Display Icons:

Display status and assist in setup and operation. The appropriate icon will turn on to indicate unit status or navigation through the setup features.

**RUN** – Run mode

**RPM** – Screen Value

**HOURS** – Screen Value

**TYPE** – Channel Type Configuration

**LOW BATT** – Low Battery Warning (displayed when condition exists)

**HISTORY** – Shutdown History

**TEST** – Test Mode

**LUBE** – Pre-lubrication Timer

**POSTLUBE** – Post-lubrication Timer

**SHUTDOWN** – Stop Mode

**ALARM** – Alarm(s) Warning (displayed when condition exists)

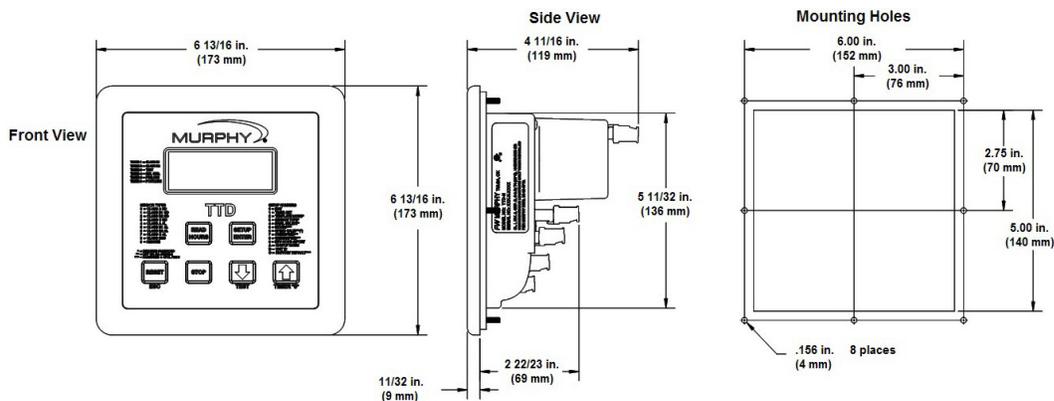
**SETPOINT** – Edit Set-point Value

**SETUP** – Setup Menu(s)

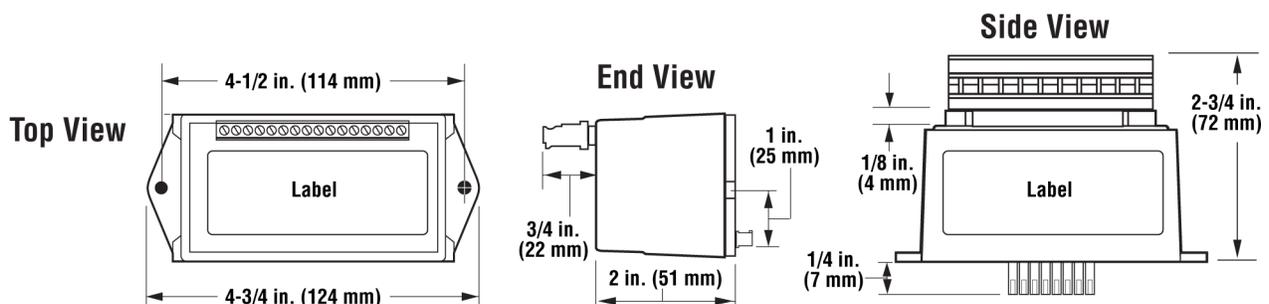
<sup>†</sup> 38.4K baud will not be available when IGN input is selected as the source for RPM calculations. When MPU is selected, this feature is available for selection.

## Dimensions

### Display Head



### Power Supply (PSU-2)

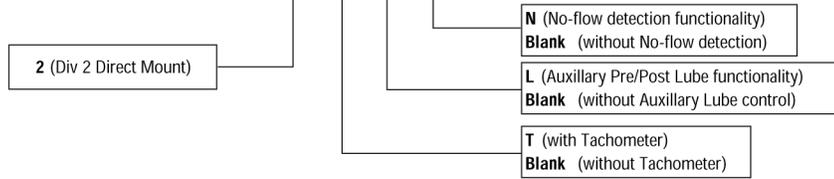


## How to Order

Order a standard TTD-H display and your choice of power supply features to complete the TTD annunciator order.

Base Model: **PSU-2 - X - X - X**

Specify model number (see chart below). List your power supply options by placing a dash (-) between each option.



MODEL NUMBER (X indicates components and features included in Model)	PSU-2 (Class 1 Grps. B.C. & D, Div 2 Power Supply, Direct Mounted)	Tachometer w/ Overspeed functionality	Auxillary Pre/Post Lube functionality	No-flow detection functionality
PSU-2	X			
PSU-2-T	X	X		
PSU-2-L-N	X		X	X
PSU-2-T-L-N	X	X	X	X

## TTD Replacement Parts and Assemblies

TTD-H	(50700597)	Display head
PSU-2	(50700596)	Div 2 Power Supply
PSU-2-T	(50700594)	Div 2 Power Supply w/ Tach
PSU-2-L-N	(50700944)	Div 2 Power Supply w/ Pre/Post Lube and No-Flow
PSU-2-T-L-N	(50700942)	Div 2 Power Supply w/ Tach, Pre/Post Lube, and No-Flow
Backup Battery	(00005125)	Lithium battery, 6VDC, 1300mAh
Choke	(50000774)	Ignition Choke Filter
TTD-H Plug Kit	(00009741)	Printed Replacement Terminal Plugs for TTD-H Sensor Inputs
PSU-2 Plug	(00009768)	Printed Replacement Plug for PSU-2 Power Connector