



PC-Programmable Temperature
Transmitter with Display

TDY

User's Manual

All product names are registered trademarks of their respective companies.

Customer Support

Moore Industries is recognized as the industry leader in delivering top quality to its customers in products and services. We perform a sequence of stringent quality assurance checks on every unit we ship. If any Moore Industries product fails to perform up to rated specifications, call us for help. Our highly skilled staff of trained technicians and engineers pride themselves on their ability to provide timely, accurate, and practical answers to your process instrumentation questions. Our headquarters and other facilities phone numbers are listed below.

There are several pieces of information that can be gathered before you call the factory that will help our staff get the answers you need in the shortest time possible. For fastest service, gather the complete model and serial number(s) of the problem unit(s) and the job number of the original sale.

Locations

World Headquarters

16650 Schoenborn Street
North Hills, California
91343-6196, **U.S.A.**
Tel: (818) 894-7111
Fax: (818) 891-2816
E-mail: info@miinet.com
TOLL FREE: 1-800-999-2900
www.miinet.com

Europe

1 Lloyds Court, Manor Royal,
Crawley
W. Sussex RH10-9QU
United Kingdom
Tel: 01293 514488
Fax: 01293 536852
FREE PHONE: 0800 525107
sales@mooreind.com

Australia

Sydney, NSW
3/1 Resolution Drive
Caringbah, New South Wales 2229
Australia
Tel: (02) 8536-7200
Fax: (02) 9525-7296
sales@mooreind.com.au

China

Room 402, No. 57,
Lane 651, Xipu Road,
Xinqiao Town, Songjiang District,
Shanghai, 201612, P. R. China
Tel: 86-21 62491499
Fax: 86-21 62490635
E-mail: sales@mooreind.sh.cn

BeNeLux

Guido Gezellestraat 106
BE-2630 Aartselaar
Belgium
Tel: 03/448.10.18
Fax: 03/440.17.97
info@mooreind.eu

Perth, WA
6/46 Angove Street
North Perth, Western Australia 6006
Australia
Tel: (08) 9228-4435
Fax: (08) 9228-4436
sales@mooreind.com.au



www.miinet.com

Table of Contents

Introduction.....	5
The TDY	5
Specifications	6
Input Type & Accuracy.....	7
Ordering Information	8
Everything You Need is Included	8
Default Factory Configuration	8
Configuring a TDY.....	9
What is First.....	9
What is Next.....	9
Installing the Software.....	10
Gathering the Equipment Needed	10-11
PC Configuration Software Summary	12
Keeping What You've Got Safe—Using the “Get Setup” Function	13
Selecting Input Type, Wiring, etc.....	14
Scaling the Input (also: Setting Reverse Output)	15
Setting the Display.....	16
Scaling the Output	17
Trimming the Input.....	18
Trimming the Output.....	18
Setting Miscellaneous Functions--Engineering Unit Readout, Input Filtering, Upscale or Downscale Drive, and Broken Wire Detection	19

Setting Output Damping.....	20
Using the Loop Test.....	20
Creating a Custom Linearization Table.....	21-22
Managing Configuration Files.....	23
Saving the Configuration Files to Disk.....	23
Retrieving a Configuration File from Disk.....	23
Retrieving a Configuration File from a Connected TDY.....	23
Installing and Connecting the TDY.....	24
Connecting the TDY in an Application.....	24
Recommended Ground Wiring Practices.....	24
CE Conformity.....	24
Dimensions.....	25-26
Installation in Hazardous Locations.....	27
Specific Conditions of Use.....	27
Operating the TDY.....	29
Maintaining the TDY.....	29
Troubleshooting the TDY.....	29
Configuration Software Error Messages.....	29
Contacting Customer Support.....	30
Intrinsically Safe Diagrams.....	31-32
Return Procedures and Warranty Info.....	33

Introduction

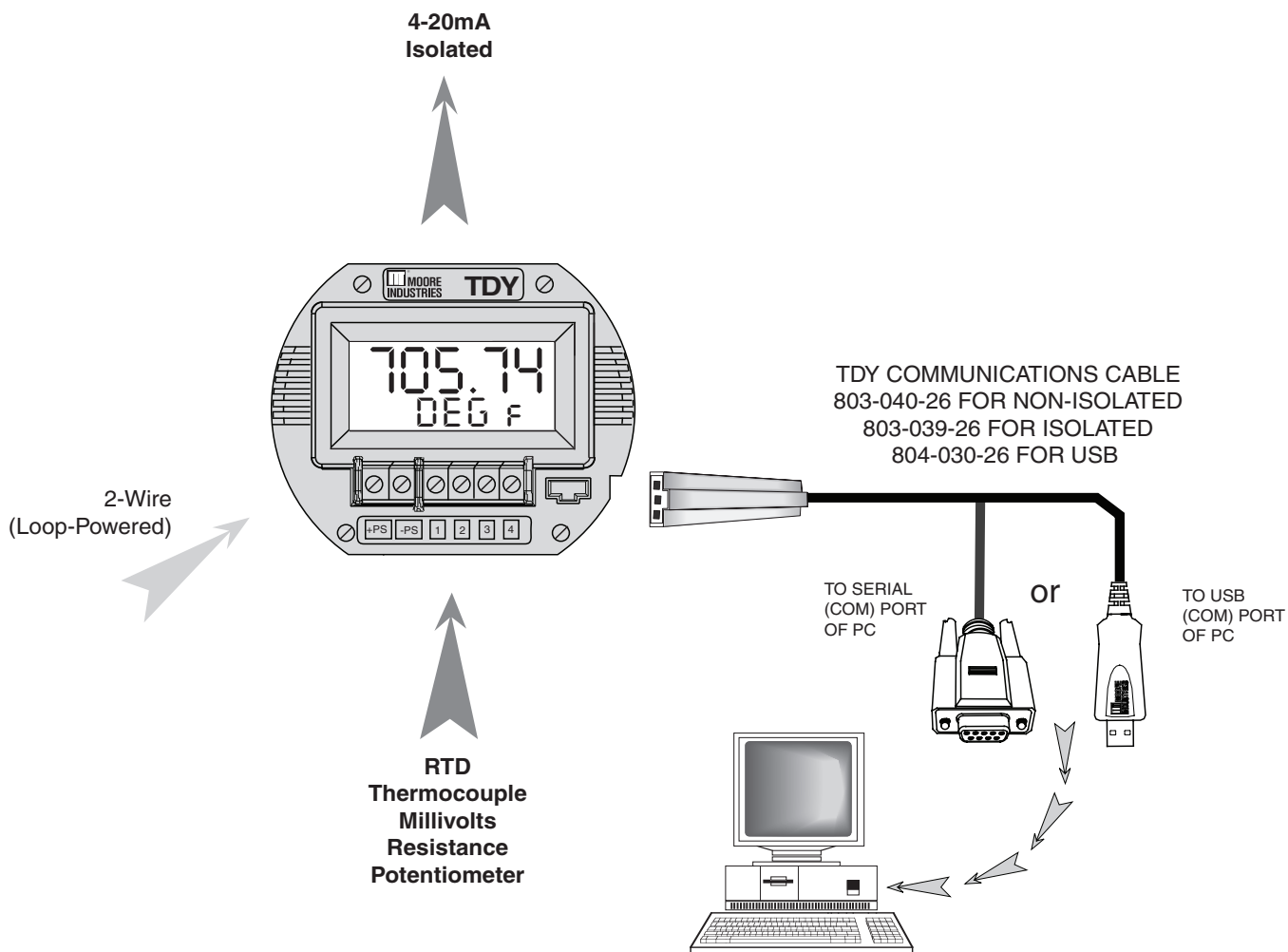
The TDY is a 2-wire (loop-powered) temperature transmitter with a digital display. It is configured using a personal computer (PC) and the software program provided by Moore Industries.

Available in your choice of explosion-proof or NEMA 4X enclosures, the TDY has certified protection in even the toughest environments. Combine this with a 20 V/m RFI/EMI immunity, and you have a transmitter that can accurately read and send temperature information in some very difficult environments.

The TDY

The TDY is an exceptionally accurate and remarkably versatile temperature transmitter with display. It transmits input from a thermocouple, RTD, direct resistance, millivolt source, or a potentiometer as a linearized, scaled, and offset 4-20mA. The output signal is proportional (or, by user designation, inversely proportional) to the input.

Figure 1. Use the PC-Programmable TDY as an interface between sensors and controllers



Specifications

<p>Performance Input Accuracy: Refer to Table 2 Output Accuracy: 4.8µA (0.03% of 4-20mA span) Overall Accuracy: overall accuracy of the unit is the combined input and output accuracy. It includes the combined effects of linearity, hysteresis, repeatability and adjustment resolution. It does not include ambient temperature effect. For T/C input only, add the Reference Junction Compensation error Reference Junction Compensation Accuracy: ±0.45°C Stability: Error % of Maximum Conformance range</p> <table border="1"> <tr> <th rowspan="2">Stability</th> <th colspan="3">Input to Output</th> </tr> <tr> <th>1yr</th> <th>3yrs</th> <th>5yrs</th> </tr> <tr> <td>T/C, mV</td> <td>0.11</td> <td>0.18</td> <td>0.24</td> </tr> <tr> <td>RTD Ohm Pot.</td> <td>0.13</td> <td>0.22</td> <td>0.28</td> </tr> </table> <p>Isolation: 500VAC/1000VDC input to output to case Measurement Cycle: Output updates at least 8 times per second Response Time: 256msec typical for the output to change from 10% to 90% for an input step change of 0% to 100% Step Response Time: 500msec typical from the time an input is applied until the output reaches 90% of its final value. Ripple: 10mV peak-to-peak, maximum.</p>	Stability	Input to Output			1yr	3yrs	5yrs	T/C, mV	0.11	0.18	0.24	RTD Ohm Pot.	0.13	0.22	0.28	<p>Performance Power Supply and Load (Continued) Effect: Negligible within power and load limits Over-Voltage Protection: 4V max., on Input; 48V max., on Output; 48V Reverse Polarity protection on output Output Current Limiting: 3.8mA and 21.4mA for input under/over range; 25mA, maximum (hardware limit) Load Capability: 583Ω @ 24V, typical; $\Omega = \frac{\text{Supply Voltage} - 10V}{0.024A}$ Burnout Protection: Total Sensor Diagnostics user-selected via Windows configuration software; Upscale to 23.6mA or Downscale to 3.6 mA. T/C Input Impedance: 40MΩ, nominal RTD Excitation: 250µA, ±10% RTD Lead Wire Resistance Maximum: RTD resistance + 2 times the lead wire resistance must be less than 4000Ω; Recommended <35Ω per wire for 3-wire inputs; <5Ω per wire for 10Ω Cu inputs</p> <p>Display Type: LCD; Top Row, 10.16mm (0.4 inch) high black digits on a reflective background; Bottom Row, 5.72mm (0.225 inch) high black digits on a reflective background Format: Two rows of five alphanumeric characters</p>	<p>Display (Continued) Decimal Points: Automatically adjusting decimal point with a two decimal place maximum (Analog output display is always two decimal places) Range: -99999 to 99999 Minimum Display Span: 1.00</p> <p>Ambient Conditions Operating and Storage Range: Transmitter: -40°C to 85°C (-40°F to 185°F); Display: -20°C to 65°C (-4°F to 149°F) Relative Humidity: 0-95%, non-condensing Effect of Ambient Temperature on Accuracy: ±0.015% of span per °C change, max (+ 0.001% of Ω reading for RTD inputs) Effect of Ambient Temperature on Reference Junction Compensation: ±0.015°C/°C change RFI/EMI Immunity: 20V/m@80-1000MHz, 1kHz AM, when tested according to IEC 61326 Common Mode Rejection: 100dB, min, @ 50/60Hz Normal Mode Rejection: Refer to Table 1</p> <p>Adjustments All settings made using Windows-based configuration program, then stored in non-volatile memory</p> <p>Weight HP-style housing: 178g (6.3 oz) 2LG housing: 1229g (2 lbs, 11.9 oz) D2LC housing: 688g (1 lb, 8.3 oz)</p>
Stability		Input to Output															
	1yr	3yrs	5yrs														
T/C, mV	0.11	0.18	0.24														
RTD Ohm Pot.	0.13	0.22	0.28														

Specifications and information subject to change without notice.

Table 1. Normal Mode Rejection Ratio Table

Sensor Type		Max. p-p Voltage Injection for 70dB at 50/60Hz
T/C: J, K, N, C, E		150mV
T/C: T, R, S, B		80mV
Pt RTD: 100, 200, 300 ohms		200mV
Pt RTD: 400, 500, 1000 ohms		800mV
Ni: 120 ohms		150mV
Cu: 9.03 ohms		100mV
Resistance	mV	
1-4kohms	250-1000	800mV
0.25-1kohms	62.5-250	200mV
0.125-0.25kohms	31.25-62.5	100mV

Table 2. Input Types, Ranges, Minimum Span and Maximum Range Specifications, and Accuracy of the TDY

Input	Type	α^*	Ohms	Conformance Range	Minimum Span	Input Accuracy		Maximum Range
RTD	Platinum	0.003750	1000	-50 to 500°C -58 to 932°F	15°C (27°F) for 100Ω inputs 10°C (18°F) for 200Ω inputs 7.5°C (13.5°F) for 500 and 1000Ω inputs	±0.11°C	±0.2°F	-100 to 560°C -148 to 1040°F
		0.003850	100, 200, 300, 400, 500, 1000	-200 to 850°C -328 to 1562°F		±0.21°C	±0.38°F	-240 to 960°C -400 to 1760°F
		0.003902	100, 200, 400 500, 1000	-100 to 650°C -148 to 1202°F		±0.15°C	±0.27°F	-150 to 720°C -238 to 1328°F
		0.003911	100, 500	-200 to 630°C -328 to 1166°F		±0.17°C	±0.31°F	-235 to 710°C -391 to 1310°F
		0.003916	100	-200 to 510°C -328 to 950°F		±0.14°C	±0.25°F	-240 to 580°C -400 to 1076°F
		0.003923	98.129	-200 to 600°C -328 to 1112°F		±0.16°C	±0.29°F	-235 to 680°C -391 to 1256°F
		0.003926	100, 470, 500	-200 to 630°C -328 to 1166°F		±0.17°C	±0.31°F	-235 to 710°C -391 to 1310°F
		0.003928	100	-200 to 850°C -328 to 1562°F		±0.21°C	±0.38°F	-260 to 962°C -436 to 1763.6°F
	Nickel	0.000672	120	-80 to 320°C -112 to 608°F	10°C (18°F)	±0.16°C	±0.29°F	-100 to 360°C -148 to 680°F
	Copper	0.000427	9.035	-50 to 250°C -58 to 482°F	100°C (180°F)	±1.2°C	±2.16°F	-65 to 280°C -85 to 536°F
Ohms	Direct resistance or Potentiometer	n/a	n/a	0-4000Ω	30Ω	±0.4Ω		n/a
T/C	J	n/a	n/a	-180 to 770°C -292 to 1418°F	35°C 63°F	±0.28°C	±0.5°F	-210 to 770°C -346 to 1418°F
				-150 to 1372°C -238 to 2501.6°F	40°C 72°F	±0.3°C	±0.54°F	-270 to 1390°C -454 to 2534°F
				-170 to 1000°C -274 to 1832°F	35°C 63°F	±0.26°C	±0.47°F	-270 to 1013°C -454 to 1855.4°F
				-200 to 400°C -328 to 752°F	20°C 36°F	±0.24°C	±0.43°F	-270 to 407°C -454 to 764.6°F
				0 to 1768°C 32 to 3214.4°F	50°C 90°F	±0.71°C	±1.28°F	-50 to 1786°C -58 to 3246.8°F
				0 to 1768°C 32 to 3214.4°F	50°C 90°F	±0.71°C	±1.28°F	-50 to 1786°C -58 to 3246.8°F
				400 to 1820°C 752 to 3308°F	75°C 135°F	±0.43°C	±0.77°F	200 to 1836°C 392 to 3336.8°F
				-130 to 1300°C -202 to 2372°F	45°C 81°F	±1.33°C	±2.39°F	-270 to 1316°C -454 to 2400.8°F
				0 to 2315°C 32 to 4199°F	100°C 180°F	±1.16°C	±2.09°F	0 to 2338°C 32 to 4240.4°F
					DC	n/a	n/a	-50 to 1000mV

* α values with both 32 and 128-point linearization curves are available. (lower resolution values provided for compatibility with older units.)

Ordering Information

Unit	Input	Output	Power	Options	Housings
TDY PC-Programmable Temperature Transmitter with Display	PRG Programmable with supplied Configuration Software (see Table 1 for descriptions of available input types; Factory Configuration available)	4-20 MA User scaleable with supplied software	10-42DC 10-30DC for -IS option	-IS Option (cFMus, ATEX and IECEX Intrinsically Safe ap- proval)	<p>BH2NG* 2-Hub, explosion-proof enclosure with two, 1/2-inch entry ports and a glass cover</p> <p>BH2TG* 2-Hub, explosion-proof enclosure with two, 3/4-inch entry ports and a glass cover</p> <p>BH2MG* 2-Hub, explosion-proof enclosure with two, M20 x 1.5 entry ports and a glass cover</p> <p>BH3NG 3-Hub, explosion-proof enclosure with three, 1/2-inch entry ports</p> <p>BH3TG 3-Hub, explosion-proof enclosure with two, 3/4-inch side-entry ports, one 1/2-inch bottom-entry port, and a glass cover</p> <p>BH3MG 3-Hub, explosion-proof enclosure with two, M20 x 1.5 side-entry ports, one 1/2-inch bottom-entry port, and a glass cover</p> <p>D2LC 2-Hub, low base, clear cover, NEMA 4X (IP66) enclosure</p> <p>HP Hockey puck housing and spring clips</p> <p>DN Snap-in mounting for HP case on TS-32 DIN rail</p> <p>FL Mounting flanges on HP suitable for relay track or screw mounting</p> <p>FLD Mounting flanges on HP suitable for 3 1/2" relay track mounting</p> <p>A suffix indicates ANZEx (TestSafe) Ex d approval (i.e. BH2NGA).</p> <p>E suffix indicates ATEX (ISseP) Ex d and Ex tD approval (i.e. BH2NGE).</p> <p>2-inch pipe mount standard for A or E suffix.</p> <p>P suffix indicates enclosure comes equipped with base and U-bolts for mounting on a 2-inch pipe (i.e. BH2NGP)</p>

To order, specify: Unit / Input/ Output / Power [Housing]

Model Number Example: TDY / PRG / 4-20MA / 10-42DC [BH2NGP]

Model and Serial Numbers Moore Industries uses a system of model and serial numbers to keep track of all of the information on every unit it sells and services. If a problem occurs with a TDY, check for a tag affixed to the unit listing these numbers. Supply the Customer Support representative with this information when calling.

If additional units are needed, use the information printed in bold text in the table above to “build” a model number for the type of transmitter required.

Each TDY order comes with one copy of our Interface Solution Configuration Tools and Installation Manuals CD.

To order additional copies of the Interface Solution Configuration Tools and Installation Manuals CD, specify Moore Industries' part number **750-75E05-01**.

To order cables, specify Moore Industries' part number **803-040-26**, or **803-039-26** for the special cable equipped with its own, self-powered input-to-output isolation circuit for operation in areas of high ground potentials. Use Moore Industries' part number **804-030-26** for Fuse Protected USB cable.

Default Factory Configuration for TDY

The following are the factory default configuration settings for your TDY unit:

Input:

RTD 4W Pt3850 100 Ohms 0-100degC

Display:

Input

Settings:

Input Trim OFF

Broken wire:

ON

Filter:

60Hz

Sensor Failure:

Up 24mA

Output:

4-20mA

Damping:

0s

Configuring a TDY

One of the benefits of the TDY transmitter is its easy-to-use PC program; there are no internal or external controls to adjust or settings to change. All operating parameters are set using the PC program included with each shipment. These settings are “downloaded” in the form of a Configuration File into nonvolatile unit memory over a connection between the PC’s serial (COM) port (or USB port when using cable 804-030-26) and a COM port on the transmitter.

This section of the manual contains instructions for configuring the TDY:

- Installing the Software
- Saving the Default Configuration (Keeping What You’ve Got Safe)
- Selecting Input Type, Wiring Configuration, etc.
- Scaling the Input/Setting Reverse Output
- Setting the Display
- Scaling the Output
- Trimming the Input
- Trimming the Output
- Setting Miscellaneous Parameters, including Readout Engineering Units in °F or °C, Input Filtering, Upscale or Downscale Drive on Sensor Failure, and Broken Input Wire Detection
- Setting Output Damping, Using the Loop Test
- Creating Custom Linearization Tables
- Managing Configuration Files

What is First

First, it is necessary to install the TDY Configuration Program on a PC. Once the program is loaded and running, nearly all of the operating parameters for the connected transmitter are shown on a single screen (see Figure 3). This makes it easy to determine which aspects of transmitter operation need to be changed to suit the application requirements.

What is Next

Once the Configuration Program is installed on the PC, the TDY can be connected to equipment to simulate input and monitor output, and with the PC program, the user can view and/or change its operating parameters.

No Transmitter Needed

It is not necessary to connect the TDY to a PC to create Configuration Files. The Configuration Program can be run without connecting a transmitter, and **most** operating parameters can be set without benefit of input from a sensor or from a transmitter.

This makes it easy to create a set of operating parameters, save them to disk, and download them to one or more transmitters at a later time.

Note, however, that **not all parameters can be set** without a transmitter. In some cases, a source of input is also required.

The TDY **must** be connected to the PC in order to:

- Trim Input
- Trim Output
- Assign a Tag
- Perform a Loop Test
- Receive (via download) a Configuration File

And, perhaps most importantly...

- SAVE THE CONFIGURATION FILE ALREADY IN THE TRANSMITTER’S MEMORY (refer to “Keeping What You’ve Got Safe—Using ‘Get Setup’”)

Installing the Configuration Software

Refer to Table 5 for the equipment needed.

1. Insert the *Moore Industries Interface Solution PC Configuration Software* CD into the CD drive of the PC. Access the CD and open the *SDY SIY TDY TRX TRY 64 bit PC Configuration software* folder.
2. Double-click the installation program located in the folder. Follow the prompts to correctly install the program.

Once the Configuration Program is installed on the PC, the TDY can be connected to equipment to simulate input and monitor output. You can then change the transmitter's operating parameter

Gathering the Equipment Needed

It is possible to create a Configuration File for a TDY without ever connecting the transmitter to a PC. Most TDY operating parameters can be setup, saved in a Configuration File, and stored on disk entirely within the Configuration Program—without ever communicating with a transmitter.

It is not possible to trim the transmitter input or output without a transmitter, a source of input, and a meter (for output trimming). Likewise, it is not possible to use the Loop Test function of the transmitter unless everything is setup as shown in Figure 2, and it is not possible to store a tag name in the memory of a transmitter without connecting that transmitter to the Configuration Program.

Table 3 lists the things needed to setup the TDY as shown in Figure 2.

Table 3. *Equipment Needed for Setting Up the TDY*

Device	Specifications
Thermocouple, RTD, Millivolt, Potentiometer Simulator, or Decade Resistance Box	Accurate to $\pm 0.05\%$ of unit span
Power Supply	10-42Vdc, $\pm 0.01\%$
Precision Load Resistor (Optional)	250 ohms $\pm 0.01\%$
Multimeter	Accurate to $\pm 0.025\%$, e.g. Fluke Model 87
Thermocouple or RTD Temperature vs. Resistance Tables	ITS68 and ITS90, or equivalent
Personal Computer	Microsoft Windows based PC; 16Mb free RAM; 20MB free disk space on hard drive Microsoft Windows XP, 7 or 10 and 1 (one) serial port or one available USB port
Moore Industries' TRX/TRY/ TDY/SIY/SDY Configuration Software	Version 4.0 or greater, successfully installed on the hard disk of the specified PC
Moore Industries' Communication Cable	Non- isolating (PN 803-040-26) Isolating (PN 803-039-26) USB Cable (PN 208-236-00) Fuse protected USB Cable (PN 804-030-26)

Note:

Be sure to use calibrated test equipment when performing any trimming operations on the TDY. Moore Industries uses equipment rated 5:1 over the rated accuracy of the unit under test. We recommend the use of equipment rated at least 3:1.

Figure 2. Use the PC Configuration Software to program the TDY

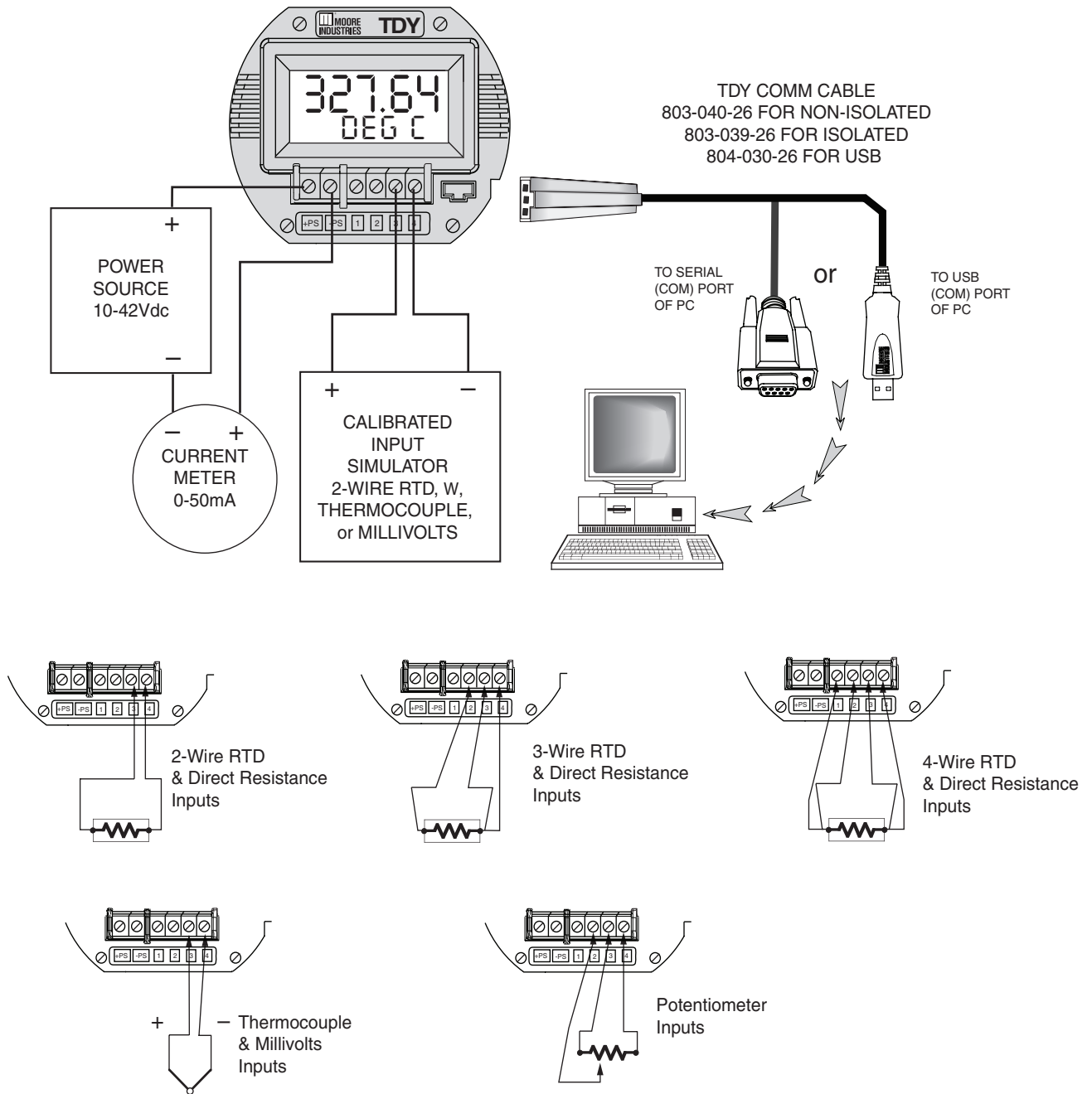
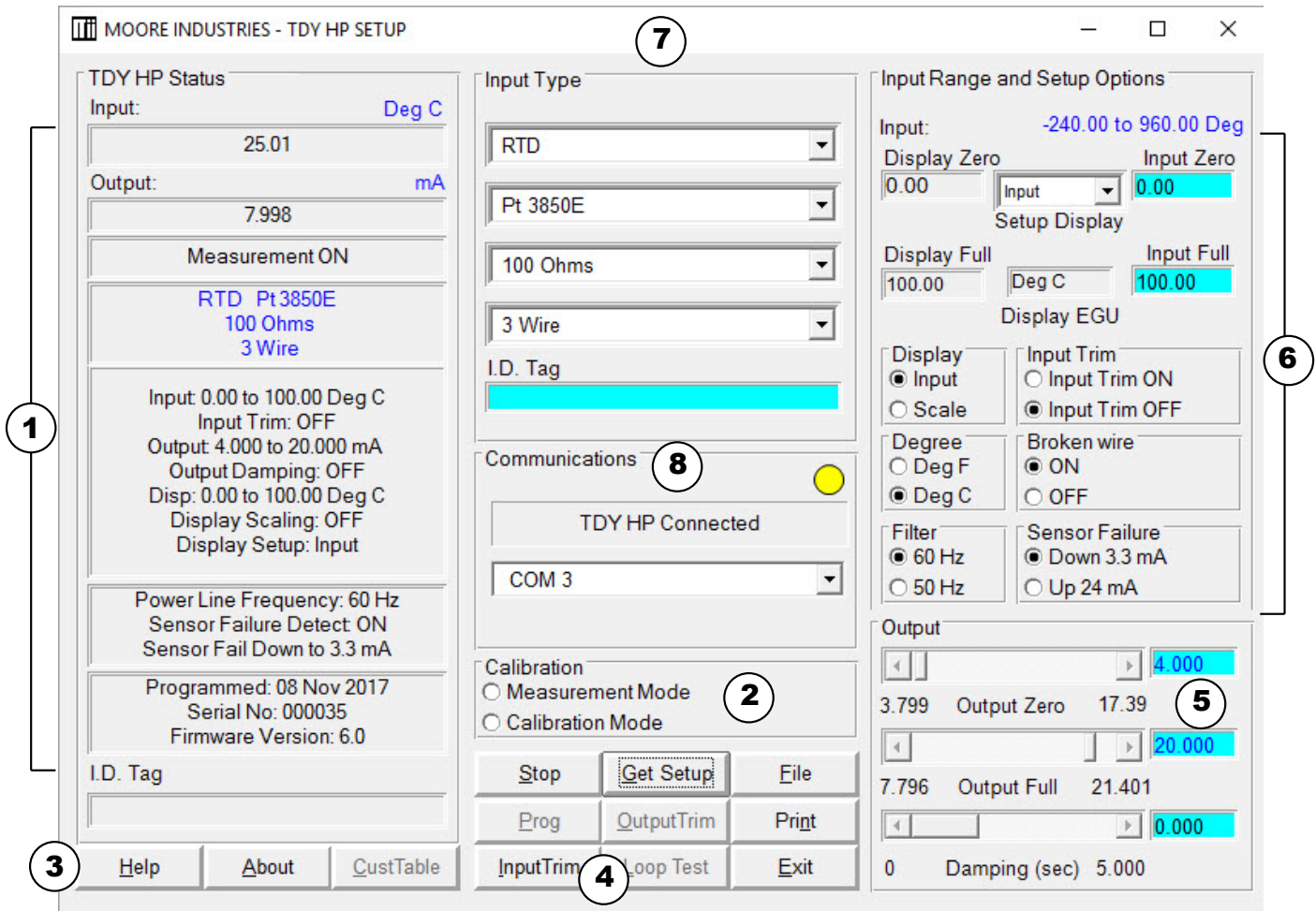


Figure 3. PC Configuration Software Screen Summary



1. TDY HP Status The left column of the screen displays the input, output, and settings of the TDY. This column will change to reflect the values on the rest of the screen when you program the TDY with its new values.

2. Calibration Use these radio buttons to change from “Measurement Mode”, the mode that you will be doing all your work from the PC in, and “Calibration Mode”, the mode that you will select when using a handheld calibrator to simulate input to the unit.

3. “Help” Buttons The “Help” and “About” buttons both provide information on the TDY Configuration Software. The “CustTable” button allows you to set up a custom linearization table for your TDY.

4. File Management Buttons This set of nine buttons are essential to all the functions of the Configuration Software, and will be used often. The names and functions of the individual command buttons may change when you press a button.

5. Output These scroll bars control the scaling and damping values of the TDY. When certain options are selected, these scroll bars are renamed to adjust the reverse output and the loop test.

6. Input Range and Setup Options Use this section to configure the TDY’s range of input and parameters of its display options.

7. Input Type The top pull-down menu of this section selects the type of input that the TDY will accept: Millivolt, Ohms, RTD, Thermocouple, or Potentiometer. The pull-down menus below it change to provide only the options for the input type you have selected.

8. Communication The communication menu displays the status of the TDY: if it is connected, and to which COM port it’s connected to. The yellow light in the upper right corner of this section will flash if the TDY is connected.

Keeping What You've Got Safe— Using “Get Setup”

Every TDY is shipped from the factory with a Configuration File already installed in its memory. This file is comprised of either the factory default set of operating parameters, or of the set of parameters specified by the customer at the time of order.

CAUTION:

*Any time a connected TDY is “programmed” by downloading a Configuration File into memory, **ALL** of the configuration parameters resident in the transmitter memory at the time of the download are **OVERWRITTEN** with whatever parameters are showing on the Configuration Program Screen. All previous parameters are then unrecoverable. This includes things like, input type, tag name, calibration date, input and/or output trim values, etc.*

IMPORTANT:

To safeguard against the accidental loss of a Configuration File, always use the “Get Setup” button and the File Management facilities under the “File” button, located at the bottom-center of the Configuration Program Main Screen.

To save the Configuration File already resident in the transmitter’s memory:

1. Start the PC Configuration Program, making sure that the TDY is connected as shown in Figure 2.
2. Click on the “Get Setup” button at the bottom-center of the Configuration Program Main Screen (see Figure 3).
The screen will flicker once, and the settings shown on the left area of the screen will match those showing on the right.
3. Click on the “File” button. This brings up an Explorer-like set of windows on the left area of the screen.
4. Enter a name for the current Configuration File (the one already in the transmitter’s memory), and click on the “Save” button.

Note:

File names must follow the DOS convention; Eight-character maximum, all lower case, no suffix.

The Configuration Program adds a suffix to the file name automatically.

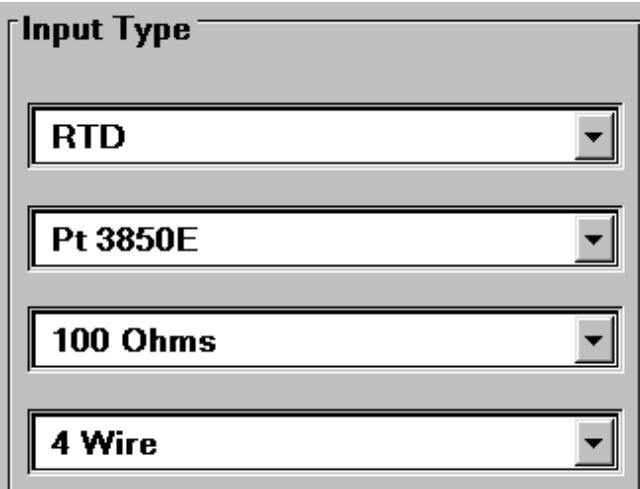
5. Answer “Yes” to save the named file to disk. The left side of the screen will now show the name of the file entered in Step 4. The “starting point” of the TDY Configuration Process is now saved on the PC disk. If you decide to abort the configuration, this file can always be downloaded back to the transmitter.
6. Click on “QuitFile” to return to the Main Configuration Screen.

Selecting Input Type, Wiring, etc.

Use the selection tools in the *Input Type* box to choose the sensor type that the TDY will be reading. Moore Industries suggests saving the initial settings resident in the transmitter before making any changes (refer to “Keeping What You’ve Got Safe”, page 9).

1. After saving, select the appropriate *Input Type* values as shown in Figure 4. Continue to change the remaining areas in *Input Type* (such as ohms, linearization, custom table, or # wires, depending on your sensor type).

Figure 4. Choosing the Input Type for the TDY.



The screenshot shows a window titled "Input Type" with four dropdown menus. The first menu is set to "RTD", the second to "Pt 3850E", the third to "100 Ohms", and the fourth to "4 Wire". Each menu has a small downward-pointing arrow on the right side.

Note:

The TDY Custom Input Linearization Table facility is available only with the “Millivolts” input selection.

RTD input selections distinguished by the “E” suffixed alpha value selections use 128-bit linearization curves.

RTD selections without the “E” suffix use standard, 32-bit curves. 128-bit curves are only available with a TDY connected to the PC.

IMPORTANT:

Settings on the Configuration Program Screen do not take effect in the unit until the Configuration File is downloaded. Skip to Step 6 for instructions on getting the settings programmed into TDY nonvolatile memory.

2. Select one of these options:
 - a. Download the current settings into the connected transmitter’s memory (Go to Step 3),
 - b. Continue creating a Configuration File by setting other parameters, or
 - c. Save the current settings into a file on disk for later downloading to a transmitter(s). Refer to “Keeping What You’ve Got Safe”, starting with Step 3 on page 9.
3. To start the Download Process, click on the “Stop” button at the bottom-center of the screen, then on the “Prog” button. This transfers the settings from the software to the memory of the connected transmitter.

CAUTION:

Any time a connected TDY is “programmed” by downloading a Configuration File into memory, ALL of the configuration parameters resident in the transmitter memory at the time of the download are **OVERWRITTEN**. These previous parameters are unrecoverable. This includes things like tag name, calibration date, trim values, etc.

The Status Bar in the upper-left corner of the Configuration Program screen will display the progress of the download of the Configuration File to the connected transmitter.

When the download is complete, the Configuration Program will emit a faint, yet distinctly audible “beep” to indicate that the download was successful.

4. Click on the “Start” button to re-enable the Configuration Program’s monitoring of the connected transmitter.

The status area of the Configuration Program screen will display the “Measurement ON” message, and will show the trimmed values resident in memory.

Scaling the Input (also: Setting Reverse Output)

This parameter allows the user to set the TDY to scale its output in response to a portion of the total range of the selected input type. In a reverse output application, the TDY output drops in proportion to a rise on the input, and rises in proportion to a drop on the input.

The instructions assume that the Configuration Program has been loaded successfully (page 6).

To set the scaling for the Input to the TDY:

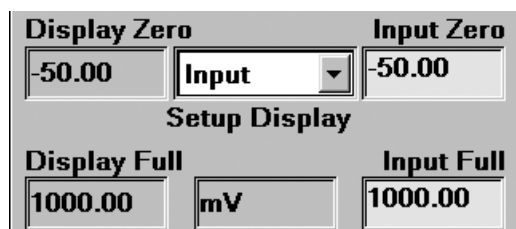
1. Start the PC Configuration program and connect a transmitter.

Note:

It is not necessary to connect a unit to the PC in order to scale the input.

2. With the Configuration Program Main Screen showing (Figure 3, page 8), select the "Input Zero" box in the upper right corner of the screen.

Figure 5. The Input Zero/Full menu.



3. Enter the value for the desired percentage Input Zero value from the application where the TDY is to be employed. Press Enter (return).
4. Access the "Input Full" box in the same fashion to set the desired 100% input value.

IMPORTANT:

Settings on the Configuration Program Screen do not take effect in the unit until the Configuration File is downloaded. Skip to Step 6 for instructions on getting the settings programmed into TDY nonvolatile memory.

5. Select one of these options:
 - a. Download the current settings into the connected transmitter's memory (Go to Step 6), or
 - b. Continue setting other parameters, or
 - c. Save the existing settings into a file on disk. Refer to "Keeping What You've Got Safe", starting with Step 3 on page 9.
6. To start the Download Process, click on the "Stop" button at the bottom-center of the screen. This will enable the "Prog" button.
7. Click on the "Prog" button (Program), to download the settings (specifically, the input type and configuration) from the PC software into the memory of the connected transmitter.

CAUTION:

Downloading a Configuration File into memory OVERWRITES all previous parameters.

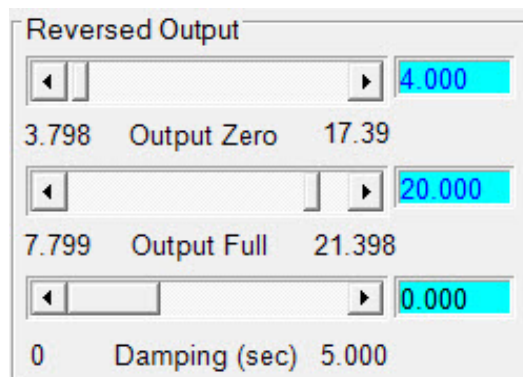
8. Click on the "Start" button to re-enable the Configuration Program's monitoring of the connected transmitter.

Setting Reverse Output

- a. Select the "Input Zero" box (Figure 5).
- b. Enter a value *GREATER THAN THE INTENDED FULL SCALE INPUT*.
- c. Select the "Input Full" box.
- d. Enter a value *LESS THAN THE ZERO SCALE INPUT* entered in Step b.

The Configuration Program will display a message in the output section of the screen to indicate that a Reverse Output situation exists (see Figure 6).

Figure 6. Set the Reversed Output using the bars in the bottom right of the Configuration Software Menu.



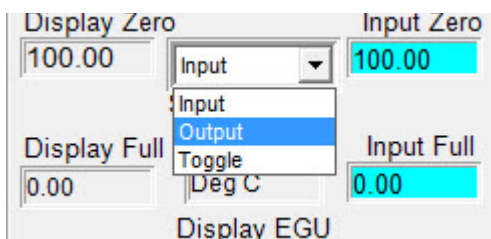
Setting the Display

The TDY has numerous settings for its display, all of which are controlled using the “Input Range and Setup Options” box. You can set the customizable display to display the input, output, or toggle between the two every two seconds. The display will even scale to display any type of engineering units you desire.

Input, Output, and Toggle

The pull-down menu shown below is used to adjust what the TDY displays. There are three settings: “Input”, which causes the TDY to display the input it is receiving, “Output”, which causes the TDY to display the 4-20mA output it is emitting, and “Toggle”, which causes the TDY to switch between displaying Input to Output every two seconds. To switch between these, simply click on the pull-down menu, select the appropriate function, and program the transmitter as described on page 9, starting with step 3.

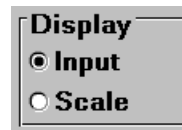
Figure 7. The pull-down menu lets you select what the TDY displays.



Display Zero & Display Full

The display zero and display full show what values will actually be displayed. If the pull-down menu in Figure 7 and the radio button on Figure 8 both have “Input” selected, then Display Zero will match Input Zero and Display Full will match Input Full. The Display columns then cannot be changed except by changing the display value.

Figure 8. Use the Display radio button to switch from standard input display to a scaleable display of any engineering unit type.



Scaling the Display

The TDY can scale its display. This feature is useful when you need to limit, expand, or manipulate the numbers the TDY displays. Doing this also gives you the option of changing the engineering units being displayed to any engineering unit type.

Scaling the input display is a simple procedure. First, click “Scale” on the radio button in Figure 8. (Note that if you have the pull-down menu in Figure 7 set to “Output”, the Display radio button will not be available.) You can then enter values into the “Display Zero”, “Display Full”, and “Display EGU” boxes. When you have entered the appropriate values, program the TDY with the new information by using the steps on page 9, starting with Step 3.

Scaling the Output

The TDY can be configured to scale its 4-20mA output to offset the performance or calibration of other instruments in the process loop.

The instructions assume that the Configuration Program has been loaded successfully (page 6). Moore Industries also suggests saving the initial settings resident in the transmitter before making any changes (refer to “Keeping What You’ve Got Safe”, page 9).

To set the output scaling for the Input to the TDY:

1. Start the PC Configuration program and connect a TDY as shown in Figure 2.

Note:

It is not necessary to connect a unit to the PC in order to scale the output.

2. Enter the desired 0% output value (between 3.800mA and 17.400mA) in the “Zero Scale Output” box at the lower right corner of the screen (see Figure 5), or click and drag the slide bar, adjacent to the box, to adjust the value for 0% as desired.
3. Enter the desired 100% output value (between 7.800mA and 21.400mA) in the “Full Scale Output” box, or click and drag the slide bar to adjust the value.

Note:

The minimum difference between 0% output and 100% output is 4.000mA.

IMPORTANT:

Settings on the Configuration Program Screen do not take effect in the unit until the Configuration File is downloaded. Skip to Step 5 for instructions on getting the settings programmed into TDY nonvolatile memory.

4. Choose from one of these options:
 - a. Download the current settings into the connected transmitter’s memory (Go to Step 5),
 - b. Continue creating a Configuration File by setting other parameters, or
 - c. Save the current settings to a file on disk for later downloading to a transmitter. Refer to “Keeping What You’ve Got Safe”, starting with Step 3 on page 9.
5. To start the Download Process, click on the “Stop” button at the bottom-center of the screen. This will enable the “Prog” button.
6. Click on the “Prog” button (Program), to download the settings (specifically, the input type and configuration) into the memory of the connected transmitter.

CAUTION:

*Any time a connected TDY is “programmed” by downloading a Configuration File into memory, ALL of the configuration parameters resident in the transmitter memory at the time of the download are **OVERWRITTEN**. This includes things like, tag name, calibration date, trim values, etc.*

7. Click on the “Start” button to re-enable the Configuration Program’s monitoring of the connected transmitter. The status area of the Configuration Program screen will display the “Measurement ON” message, and will show the trimmed values resident in memory.

Trimming the Input

Use this feature of the TDY to enhance the accuracy of the transmitter by precisely matching its actual reading of the input to its scaling of the either one or two input points. Trim the output by following the directions below:

1. Connect the transmitter to your PC using the setup shown in Figure 2.
2. Click the radio button labeled "Input Trim On".
3. Click "Start", then "InpTrim".
4. Select whether you will trim two points (upper and lower) or just one point by clicking on the appropriate radio button in the "Trim Pnts" section.
5. In the "Trim Lower" and "Trim Upper" boxes, type in the sensor's value that you are trimming.
6. Attach the sensor that you wish to trim to the transmitter and place the sensor in a calibration bath. Adjust the bath until its temperature matches the "Trim Lower" value you have chosen. Click "Trim Lower" and wait for it to capture the value.
7. Attach the sensor that you wish to trim to the transmitter and place the sensor in a calibration bath. Adjust the bath until its temperature matches the "Trim Upper" value you have chosen. Click "Trim Upper" and wait for it to capture the value.
8. Click on the button labelled "QuitTrim", then the "Stop" button, and finally the "Prog" button to send the trim values to the transmitter.

Trimming the Output

The TDY has a function that allows precise control over its output. Note that to activate this function, a unit must be connected in the setup to current meter, as shown in Figure 2.

To trim TDY output:

1. Set all unit parameters on the TDY Configuration Screen as required for your intended application.

When the Configuration File shown on the screen has been modified for your application, click "Stop" to stop measurement.

2. Click "OutTrim".
3. Select and move the "Zero Scale Output" or the "Full Scale Output" slide bar to adjust the TDY output.

Monitor the output with a calibrated current meter or with a voltmeter measuring the drop across a precision, 250 Ohm resistor (see Figure 2).

4. When both zero and full scale have been adjusted to satisfaction, press "QuitTrim", then "Prog" to program the SIY with the new trim values.

Note:

Changing the settings shown on the screen in "Trim" mode DOES NOT CHANGE THE UNIT'S OPERATING PARAMETERS, it only updates the screen. The settings are saved to non-volatile memory by using the "Prog" function.

The "TDY Status" area of the Configuration Screen will reflect the new output settings.

Figure 9. Trim Capture Box

The screenshot shows a software interface titled "Input Range and Setup Options". At the top, it displays "Input: -240.00 to 960.00 Deg". Below this, there are two sections for trimming. The first section is for the lower trim, with a "Captured Lower" field containing "-0.10" and a "Trim Lower" field containing "0.00". A "Trim Low" button is positioned between these two fields. The second section is for the upper trim, with a "Captured Upper" field containing "99.87" and a "Trim Upper" field containing "100.00". A "Trim Upp" button is positioned between these two fields.

Setting Miscellaneous Functions— Engineering Unit Readout, Input Filtering, Upscale or Downscale Drive, and Broken Wire Detection

There are several “radio buttons” on the TDY Configuration Program Main Screen that control ancillary transmitter functions. It is not necessary to have a transmitter hooked up to the PC in order to set these parameters and save them in a Configuration File.

Setting Engineering Unit Readout

When a temperature sensor is designated as the input to the transmitter, the radio buttons for “Degree” are enabled.

Use this setting to have the Configuration Program calculate the Centigrade or Fahrenheit temperature for readout in the “Status” area of the screen whenever the PC is being used to monitor the input from the connected sensor and from the display if the “Input” option in the “Display” section is selected.

Setting Input Filtering

Use this radio button setting to filter out noise on the power to the transmitter.

Choosing Between Upscale and Downscale Drive

The TDY transmitter can be configured to provide a special warning, using its output, of a breakdown in its connected sensor or sensor wiring. Use this radio button setting to configure the transmitter to drive its output either up to 24mA or down to 3.3mA when a sensor or sensor wiring failure is detected.

Note:

There is a difference between the available Full Scale output setting and the Upscale Drive, and between the available zero scale output setting and the Downscale Drive:

The TDY transmitter will only output 24mA or 3.3mA (as configured) in the event of a sensor or sensor wiring failure (upscale/downscale drive).

If sensor input drops below the rated range, output drops to a minimum of 3.8mA. If sensor input rises above the rated range, output rises to 21.4mA.

This allows the user to distinguish between an input failure and an input over or under-range condition.

Disabling Broken Wire Detection

One of the premier features of many of Moore Industries’ temperature transmitters is our Total Sensor Diagnostics® system. During operation, the TDY sends random micro-amp pulses through input wiring to check for broken wiring or a burned out sensor.

Working with a Millivolt Input

When the transmitter is connected to a PC, the “TDY Status” section of the Main Configuration screen displays the message “Broken Wire” whenever problems are detected on the input, and the transmitter itself drives its output upscale or downscale.

This can cause problems for some types of millivolt calibrators and input sources. To permanently disable this feature when the TDY is working in a millivolt input configuration, set the “Broken Wire” radio button in the center-right section of the Configuration Screen to OFF.

Working with a Thermocouple or RTD Input

Total Sensor Diagnostics can also cause problems with some types of temperature calibrators. It is not possible to disable the feature by setting the “Broken Wire” radio button to OFF, as with millivolt inputs.

Instead, when working with thermocouple or RTD inputs, set the “Calibration” radio button in the lower-left area of the Configuration Screen to “Calibration Mode”. This temporarily disables Total Sensor Diagnostics.

Note:

It is not possible to set a TDY transmitter into Calibration Mode (Sensor Diagnostics OFF) permanently. The “Calibration Mode” setting remains in effect only until a Configuration File is downloaded to the transmitter.

Working with a Configuration File

Also, when working with a Configuration File, it may be necessary to turn off Total Sensor Diagnostics in order to complete the settings for one or another aspect of transmitter operation. To do this, click on the “Stop BW” (Stop Broken Wire Detection) button when it is active on the bottom of the screen.

Setting Output Damping

The Output Damping function of the TDY allows the user to introduce a delay into the response of the transmitter in order to minimize the effect of any input oscillations on the output. The higher the damping value (set in seconds), the longer the TDY will take to respond to trends on the input.

Note:

It is not necessary to connect an input device to the PC in order to select and configure the Damping Value.

To set the damping value, either adjust the position of the slider bar in the lower-right area of the Configuration Program Main Screen, or enter a value directly into the space provided.

The default damping value is 0 seconds. The maximum allowable damping value is 5.056 seconds.

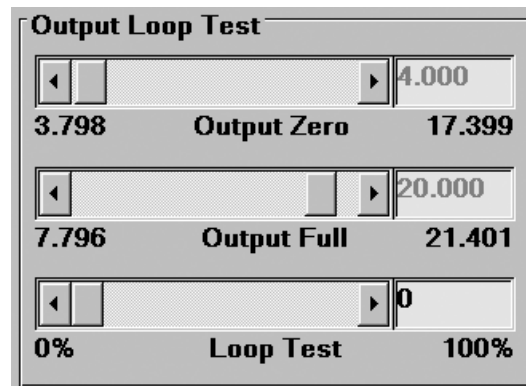
Using the Loop Test

The TDY Loop Test feature allows the user to employ the transmitter's output to "trim" other instruments in the loop.

To use the Loop Test feature, the connected TDY must stop measuring input.

1. Click on the "Stop" button.
2. Click on the "Loop Test" button.
This enables a slide bar in the lower-right area of the Configuration Screen.
3. Use the slide bar to adjust the output of the connected TDY to a percentage of the configured scale. Monitor the effect of this on other instruments in the loop, and adjust accordingly.
4. Click on "Quit Loop" to stop using the Loop Test feature.

Figure 10. The Output Loop Test scroll bars.



Creating a Custom Linearization Table

The TDY supports user-defined linearization of Millivolts inputs. Up to 85 input/output points can be defined, and the user can also specify the format and engineering units of the output (viewable with the Configuration Program).

This section explains how to create a Custom Linearization Table for downloading into TDY memory.

The instructions assume that the Configuration Program has been loaded successfully. Moore Industries also suggests saving the initial settings resident in the transmitter before making any changes.

To create a Custom Linearization Table:

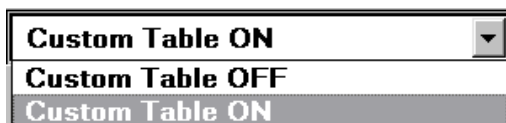
1. Attach the equipment listed in Table 1 as shown in Figure 2 and start the PC Configuration Program.

Note:

It IS NECESSARY to connect a unit to the PC in order to create a Custom Linearization Table.

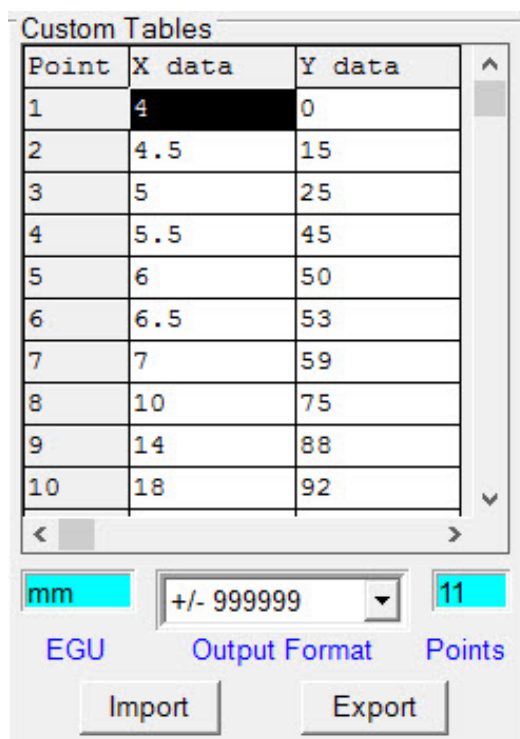
2. Use the pull-down menu to set "Linearization ON". Then click the "CustTabl" button in the lower-left area of the Configuration Main Screen.

Figure 11. Linearization Must be set to ON to Create a Custom Table



3. Click on the "CustTabl" (Customize Linearization Table) button. This causes the Configuration Program to change its upper-right corner area to accommodate the table.

Figure 12. Creating a Custom Linearization Table



4. Use the table fields to set values for input and output from the transmitter's intended application.

Use the Up, Down, Left, and Right arrow keys on the PC keyboard to move the cursor among the cells in the table.

5. Use the "Restore" button to reset the table to the table stored in the TDY's memory.

Caution:

Restoring the configuration file erases any values in the table, overwriting them with whatever is stored in the most recent file.

6. Use the "EGU" field to set the Engineering units of the readout from the transmitter when connected to the Configuration Program.
7. Set the "Output Format" field to the desired resolution using the pull-down menu.
8. Enter the number of points to use to constitute the Linearization Table in the "Points" field.

The Rules for Custom Linearization:

- The difference between any consecutive values in the table (in either column) must be less than 50% of the entire configured range.
- One “Output EGU” value per “Input mV” value only.
- It is not necessary to use all 85 available points, but the first and last points in the curve always default to the 0% and 100% input scale (input range).
- If you decide not to use all 85 points, you must change the number of points in the “Points” field to the number you wish to use.

Note:

Moore Industries suggests filling in the EGU (Engineering Units), then the number of points, and finally the values in the table.

9. When the table is complete, click on the “QuitTabl” button and answer “Yes” on the pop-up dialog box.
10. Click on the “Prog” (Program) button to download the output trim settings into the transmitter memory.

CAUTION:

Any time a connected TDY is “programmed” by downloading a Configuration File into memory, ALL of the configuration parameters resident in the transmitter memory at the time of the download are OVERWRITTEN.

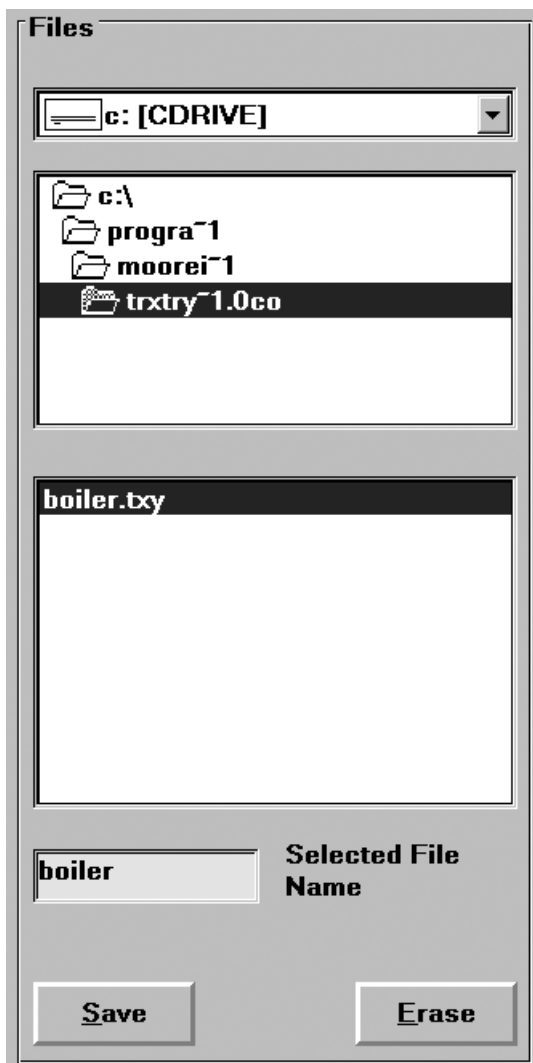
This includes things like: tag name, calibration date, trim values, etc.

Once a transmitter’s memory is “erased” in this fashion, the old operating parameters are unrecoverable, and will have to be regenerated from scratch if needed again.

Managing Configuration Files

Once all the parameters for a transmitter are set, they can be saved to disk on the PC using the “File” menus and fields.

Figure 13. The File Menu.



Saving a Configuration File to Disk

1. Click on the “File” button. This brings up an Explorer-like window on the left area of the screen.
2. Enter the file name that you wish to save in the “Selected File Name” box.

Note:

File names must follow the DOS convention. Eight-character maximum, all lower case, no suffix.

The Configuration Program adds a suffix to the file name automatically.

3. Use the Explorer-like interface to designate the location on the PC drive (or floppy) for the file to be saved.
4. Click on “Save”
5. Click “Yes” to save the named file to disk.

The left side of the screen will now show the name of the file entered in Step 2 resident on disk.

Retrieving a Configuration File from Disk

1. From the Configuration Program Main Screen, click on the “File” button to bring up the File Management portion of the program.
2. Use the Explorer-like file display (see Figure 13) to locate the file to be retrieved, and click on the file to highlight it.
3. Click on the “Quit File” button.

The Configuration Screen will change to show the parameters entered into the retrieved file. The parameters can now be edited and/or downloaded into the memory of a connected TDY.

Retrieving a Configuration File from the Connected TDY

Make sure a transmitter is connected and communicating properly with the Configuration Program, then simply click on the “GetSetup” button.

The Configuration Program Screen changes to show the parameters resident in the memory of the connected transmitter. The parameters can now be edited, saved to disk, and/or edited and re-downloaded into memory.

Printing Saved Configurations

1. Click on the "File" button. This brings up an Explorer-like window on the left area of the screen.
2. Navigate to the save file you want to print and click on it.
3. Click on the "Print" button.

Note:

Printing saved configurations must be done when the Explorer-like file window is up.

Installing and Connecting the TDY

Now that the TDY has been programmed to your satisfaction, it is ready for installation.

The TDY is available only in the HP housing style, but may be enclosed in any one of several types of certified or uncertified connection heads. Consult your local Moore Industries' Interface Solutions Expert for information on the type of enclosure that best suits your application.

Connecting the TDY in an Application

Moore Industries suggests installing the TDY by first mounting the unit in its intended application, then making the electrical connections to input, output, and power. Before any installation, make sure that the unit has been bench checked to ensure that it is configured and calibrated properly for its intended application.

Recommended Ground Wiring Practices

Moore Industries recommends the following ground wiring practices:

- Any Moore Industries product in a metal case or housing should be grounded.
- The protective earth conductor must be connected to a system safety earth ground before making other connections.
- All input signals to, and output signals from, Moore Industries' products should be wired using a shielded, twisted pair wiring technique. Shields should be connected to an earth or safety ground.
- For the best shielding, the shield should be run all the way from the signal source to the receiving device. (see Note below)
- The maximum length of unshielded input and output signal wiring should be 2 inches.

Note:

Some of Moore Industries' instruments can be classified as receivers (IPT², IPX², etc.) and some can be classified as transmitters (TRX, TRY, etc.) while some are both a receiver and a transmitter (SPA², HIM, etc). Hence, your shield ground connections should be appropriate for the type of signal line being shielded. The shield should be grounded at the receiver and not at the signal source.

CE Conformity

Installation of any Moore Industries' products that carry the CE marking must adhere to the guidelines in the Recommended Ground Wiring Practices section in order to meet the EN 61326 requirements set forth in the applicable EMC directive.

Figure 14. The Dimensions of the HP housing for the TDY unit.

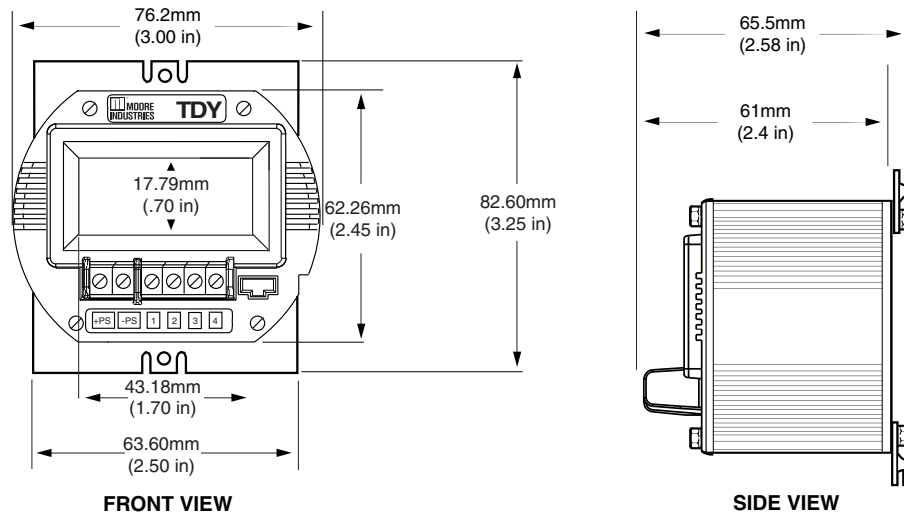
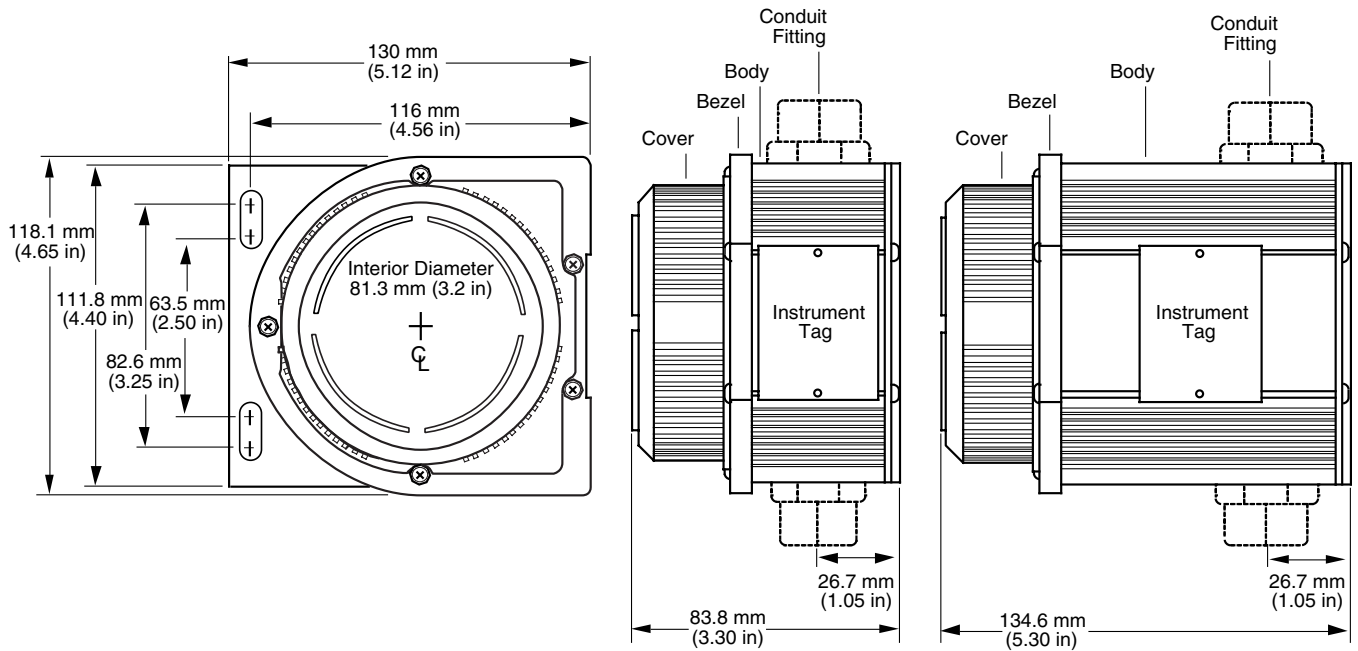
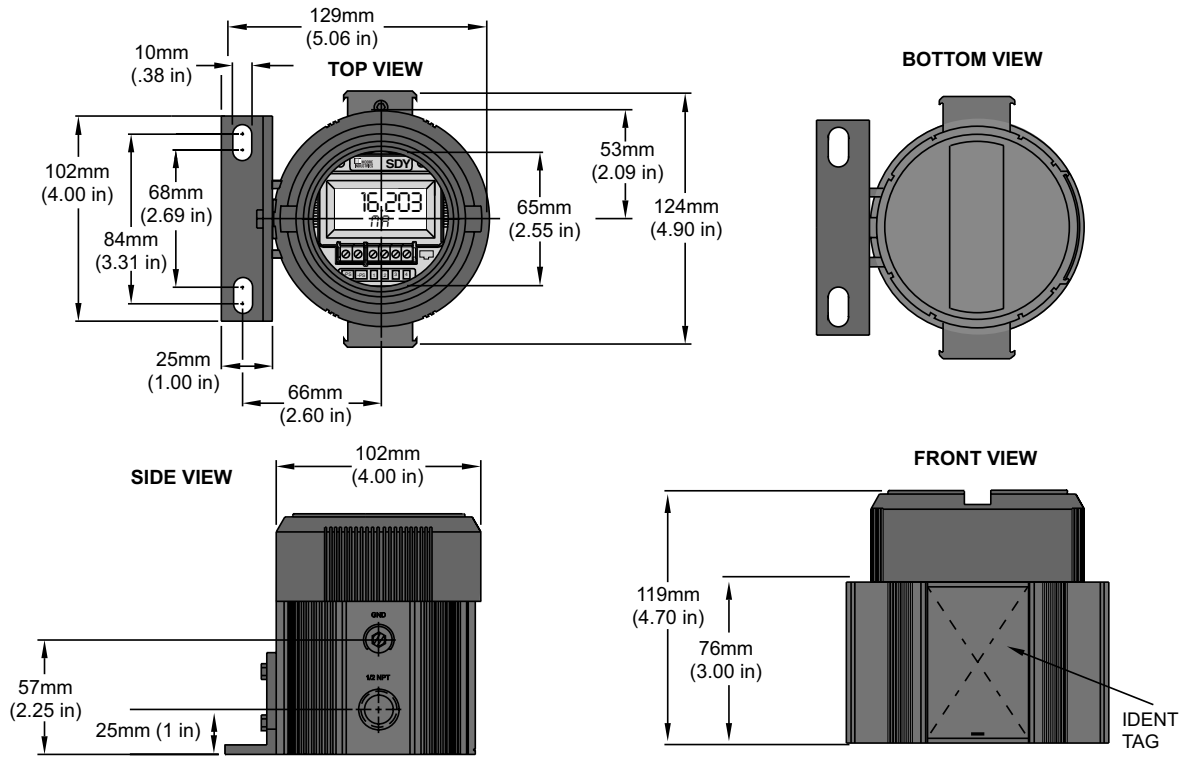


Figure 15. The Dimensions of the D-Box housing for the TDY unit.



TDY

Figure 16. The Dimensions of the explosion-proof housing for the TDY unit.



Installation in Hazardous Locations

This section contains important information regarding installation of TDY in Hazardous Area Locations.

WARNING:

Substitution of components is not allowed, as it may impair the intrinsic safety.

WARNING:

To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

WARNING:

Explosion Hazard. Do not disconnect equipment when a flammable or combustible atmosphere is present.

Maximum operating parameters of the "COM" port for use in Non-Hazardous areas shall not exceed 3.0V, 300mA and 240mW.

Specific Conditions of Use

The following instructions must be adhered to when the TDY is used in hazardous locations and potentially explosive atmospheres.

cFMus Installations

Intrinsically Safe Applications Class I, Division 1, Groups A-D Class1, Zone 0, AEx ia IIC, Ex ia IIC

The TDY shall be installed in an enclosure which maintains an ingress protection rating of at least IP20 and also meets the requirements of ANSI/ISA 61010-1 or C22.2 No 1010-1.

The COM port shall not be used in Hazardous areas.

Nonincendive, Type n Applications Class I, Division 2, Groups A-D Class1, Zone 2, AEx nA IIC, Ex nA IIC

When installed as Division 2 equipment, the TDY shall be mounted within a tool-secured enclosure which meets the requirements of ANSI/ISA 61010-1 or C22.2 No. 1010-1 and be capable of accepting the applicable wiring method per the NEC or as specified in the C22.1 Canadian Electrical Code, Part I.

When installed as Zone 2 equipment, the TDY shall be mounted within a tool-secured enclosure which meets the requirements of ANSI/ISA 60079-0 or CAN/CSA-E60079-0 and ANSI/ISA 60079-15 or CAN/CSA 60079-15 and be capable of accepting the applicable wiring methods per the NEC or as specified in the C22.1 Canadian Electrical Code, Part I. The enclosure shall, at a minimum, meet the requirements of IP54.

On installation of Zone 2 equipment, the TDY shall be provided with supply transient protection external to the apparatus such that the voltage at the supply terminals of the TDY does not exceed 58.8V peak or 58.8Vdc.

The COM port shall not be used in Hazardous areas

European Union Installations (ATEX 2014/34/EU Directive)

Intrinsically Safe Applications - Zone 0 II 1 G Ex ia IIC

The TDY shall be installed in an enclosure which maintains an ingress protection rating of at least IP20.

The communications port shall be programmed through Moore Industries Cable, Part No. 804-030-26, as described on Control Drawing 100-100-54.

The Cable cannot be used in Hazardous Areas or in ambient temperatures in excess of 75° C.

Type n Applications – Zone 2 II 3 G Ex nA IIC

When installed as Category 3 equipment, the TDY shall be mounted within a tool-secured enclosure which meets the requirements of EN 60079-0 and EN 60079-15 and is capable of accepting the applicable wiring methods specified in EN 60079-14. The enclosure shall, at a minimum, meet the requirements of IP54.

On installation, the TDY shall be provided with supply transient protection external to the apparatus such that the voltage at the supply terminals of the TDY does not exceed 119V peak or 119Vdc.

The COM port shall not be used in Hazardous areas.

IECEx Installations

Intrinsically Safe Applications - Zone 0 Ex ia IIC

The TDY shall be installed in an enclosure which maintains an ingress protection rating of at least IP20.

The communications port shall be programmed through Moore Industries Cable, Part No. 804-030-26, as described on Control Drawing 100-100-54.

The Cable cannot be used in Hazardous Areas or in ambient temperatures in excess of 75° C.

Type n Applications – Zone 2 Ex nA IIC

When installed as EPL Gc equipment, the TDY shall be mounted within a tool-secured enclosure which meets the requirements of IEC60079-0 and IEC60079-15 and be capable of accepting the applicable wiring methods for the country of origin. The enclosure shall, at a minimum, meet the requirements of IP54.

On installation, the TDY shall be provided with supply transient protection external to the apparatus such that the voltage at the supply terminals of the TDY does not exceed 119V peak or 119Vdc.

The COM port shall not be used in Hazardous areas.

Operating the TDY

Once configured, installed, and supplied with the correct power, the TDY transmitter begins to operate immediately. Depending upon environmental conditions, it can be expected to continue to operate unattended indefinitely.

Maintaining the TDY

Moore Industries suggests a quick check for terminal tightness and general unit condition every 6-8 months, depending upon the severity of conditions. Things such as ambient vibration, corrosive atmospheres, extreme heat or cold, etc., can play a role in shortening the service life of any piece of electronic equipment.

IMPORTANT:

Always adhere to any site requirements for programmed maintenance.

Troubleshooting the TDY

If a transmitter's performance begins to deteriorate and a physical check of the installation uncovers no adverse conditions or damage, remove the offending unit from service and re-perform the Configuration Procedures from earlier in this manual.

Configuration Software Error Messages

Data fields on the Configuration Main Screen can change color or appearance in some way to indicate that an attempt is being made to create a nonstandard or ill-advised condition in the Configuration File.

“Zero or Full Scale Outside Conformance Range”

Setting thermocouple input parameters to zero or full scale values that fall outside the published ISA thermocouple tables will cause this error message to appear on screen.

This condition is “downloadable” to a TDY. It is intended to provide the user with the ability to monitor general trends on the input, functioning within the rated accuracy whenever input is within the conformance range, but inherently less accurate outside the range.

“Reverse Output”

Setting the parameter for “Input Zero” numerically above the parameter for “Input Full Scale” causes this message in the “Output” section of the Configuration Screen. This condition is downloadable to the unit, and causes transmitter output to rise proportionally in response to a drop on the input, and to fall proportionally as the input rises.

“Table Data Invalid”

If there is a broken or loose communication wire, ambient electronic noise, or a problem with the memory chip inside the transmitter, this message may appear.

To fix the condition, make sure that the desired operating parameters are displayed on the Configuration Screen, and click on the “Prog” (Program) button. This should override the corrupt configuration information in unit memory and reset the parameters correctly.

Contacting Customer Support

Moore Industries is recognized as the industry leader in delivering top quality to its customers in products and services. We perform a battery of stringent quality assurance checks on every unit we ship. If any Moore Industries product fails to perform up to rated specifications, call us for help. Our highly skilled staff of trained technicians and engineers pride themselves on their ability to provide timely, accurate, and practical answers to your process instrumentation questions.

Factory phone numbers are listed on the back cover of this manual.

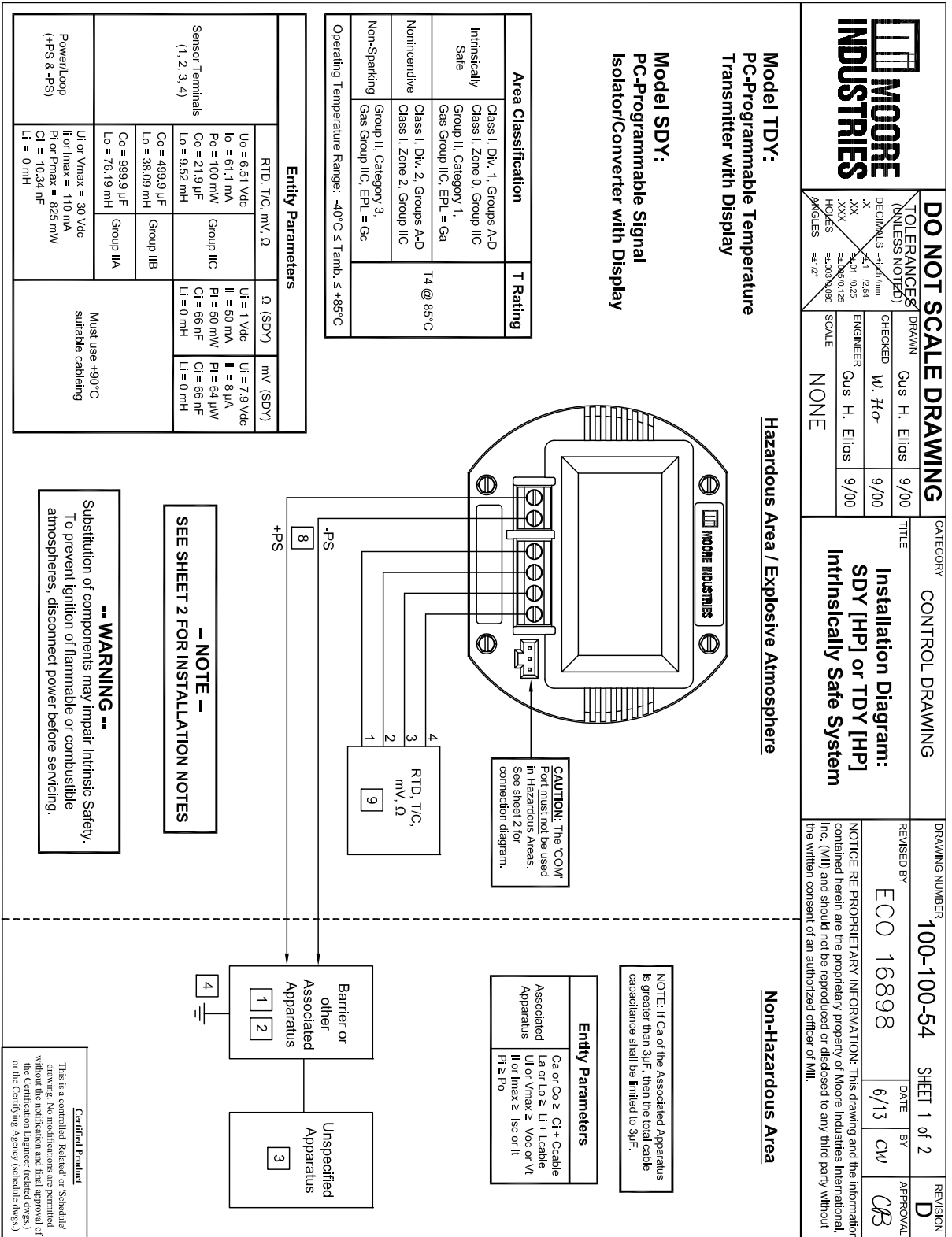
If problems involve a particular TDY, there are several pieces of information that can be gathered from the installation **before the factory is called** that will help our staff get the necessary answers **in the shortest time possible**. For the fastest service, gather:

- The complete model number(s) of the problem unit(s)
- The complete serial number(s) of the problem unit(s)
- The job number
- The purchase order or invoice under which the unit(s) was(were) ordered

Intrinsic Safety

This page contains the installation diagram for the TDY carrying the intrinsically safe option. It also includes guidelines for setting up zener barriers necessary in these types of applications.

These diagrams must be used to augment the installation instructions earlier in this manual for units that are to operate in areas requiring intrinsically safe instrumentation.



	DO NOT SCALE DRAWING		CATEGORY	CONTROL DRAWING	DRAWING NUMBER	100-100-54	SHEET 2 of 2	REVISION
	TOLERANCES (UNLESS NOTED)	DRAWN	CHECKED	ENGINEER	SCALE	ANGLES	#1/2"	#1/4"
DECIMALS = ±0.005 mm	FRACTIONS = ±1/32"	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm	HOLE DIA. = ±0.005 mm
X	XX	XXX	XXXX	XXXXX	XXXXXX	XXXXXXX	XXXXXXXX	XXXXXXXXXX
±0.125	±0.25	±0.5	±1.0	±2.0	±4.0	±8.0	±16.0	±32.0
NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
Cus H. Elias		9/00		DATE		BY		APPROVAL
SEE Sht. 1		SEE Sht. 1		SEE SHEET 1		SEE SHEET 1		D
<p>Installation Diagram: SDY [HP] or TDY [HP] Intrinsically Safe System</p>								
<p>NOTICE RE PROPRIETARY INFORMATION: This drawing and the information contained herein are the proprietary property of Moore Industries International, Inc. (MI) and should not be reproduced or disclosed to any third party without the written consent of an authorized officer of MI.</p>								

Installation Notes:

1. The Associated Apparatus must be FM Approved for installations in the U.S.; Canadian Approved for installations in Canada; ATEX Certified for installations in Europe and IECEx Certified for IECEx installations.
2. Associated apparatus manufacturer's installation drawing must be followed when installing this equipment.
3. The control room equipment (unspecified apparatus) connected to the Associated Apparatus must not generate more than 250 Vrms or Vdc, or the marked Um on the associated apparatus, whichever is less.
4. Installations in the U.S. shall be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the latest edition of the National Electrical Code (ANSI/NFPA 70). Resistance between Intrinsically Safe Ground and earth ground must be less than 1.0 Ohm.
5. Installation in Canada shall be in accordance with the latest edition of the C22.1 Canadian Electrical Code, Part I.
6. Installation in Europe shall be in accordance with the latest editions of the wiring practices for the country of origin and EN 60079-14.
7. Installation for IECEx certification shall be in accordance with the latest editions of the wiring practices for the country of origin.
8. The Entity Concept allows interconnection of associated apparatus and intrinsically safe apparatus when the following is true: $U_o \leq U_i$, $I_o \leq I_i$, $P_o \leq P_i$, $C_o \leq C_i$ + Ccable; $L_o \leq L_i$ + Lcable.
9. The mV and Ohm's equipment must be FM Approved and meet the entity requirements for installations in the U.S.; Canadian Approved and meet the entity requirements for installations in Canada; ATEX Certified and meet the entity requirements for installations in Europe and IECEx Certified and meet the entity requirements for IECEx installations.
10. No revision is allowed to this drawing without prior FM Approval.

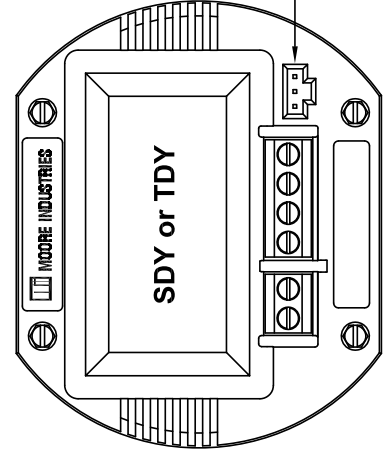
-- WARNING --

Substitution of components may impair Intrinsic Safety. To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.

Where English is not a language of the Country in which the equipment is being used, please apply to Moore Industries International, Inc. (MI) for a suitable translation.

Installation may only be carried out by suitably trained personnel and in accordance with national wiring regulations or codes of practice.

**"COM" Port Connection Diagram
Use in Non-Hazardous Area Only**



This is a controlled 'Related' or 'Schedule' drawing. No modifications are permitted without the notification and final approval of the Certification Engineer (related dwgs.) or the Certifying Agency (schedule dwgs.)

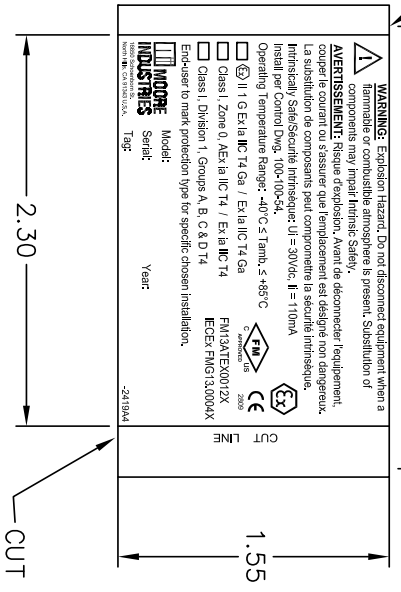


DO NOT SCALE DRAWING	
TOLERANCES (UNLESS NOTED)	DRAWN C. Whon
DECIMALS =-inch/mm	CHECKED V. Garcia
.X =±.1 / 2.54	ENGINEER W. Tchon
.XX =±.01 / 0.25	SCALE 1/1
.XXX =±.005 / 0.125	
HOLES =±.003 / 0.080	
ANGLES =±1/2°	

CATEGORY	COMPUTERIZED LABEL
TITLE	ID LABEL, SDY/TDY [HP] -CFMUS/IECEX/ATEX Intrinsically Safe

DRAWING NUMBER	200-251-2419	REVISION	A4
REVISED BY	ECO 18883	DATE BY	9/20 TG
NOTICE RE PROPRIETARY INFORMATION: This drawing and the information contained herein are the proprietary property of Moore Industries International, Inc. (MI) and should not be reproduced or disclosed to any third party without the written consent of an authorized officer of MI.			

FRONT FACE SLIT (REF) (2.60)



Certified Product

This is a controlled 'Related' or 'Schedule' drawing. No modifications are permitted without the notification and final approval of the Certifying Engineer (related dwgs.) or the Certifying Agency (schedule dwgs.)

This drawing is related to schedule drawing 200-251-2419, Revision A, and is technically equivalent.

- NOTES: UNLESS OTHERWISE SPECIFIED**
1. MATERIAL: .002 SILVER, IDENTIPLATE (Mil P/N 200-305-00) CUT TO SIZE AS SHOWN. REFER TO LABEL SPEC. DRAWING 200-305-00. ADHESIVE BACKING IS UL/CSA APPROVED HIGH PERFORMANCE ACRYLIC. PRINTING IS WITH BLACK, UL/CSA, THERMAL TRANSFER RIBBON (801-003-96).
 2. THE FIXED TEXT AND GRAPHIC FIELDS FOR THIS LABEL ARE STORED UNDER NO. 200-251-2419 IN THE LEG1 93 LABEL MACHINE COMPUTER HARD DISK.
 3. TO PRINT THIS LABEL: JOB SPECIFIC MODEL, SERIAL, AND TAG NUMBERS WILL BE DOWNLOADED FROM THE MENTOR DATA FILE AND PRINTED ALONG WITH THE FIXED TEXT AND GRAPHICS (SUPPLIED BY THE LEG1 93 DATA FILE) TO CREATE THE FINISHED LABEL.
 4. ALL MATERIAL MUST BE ROHS COMPLIANT.

RETURN PROCEDURES

To return equipment to Moore Industries for repair, follow these four steps:

1. Call Moore Industries and request a Returned Material Authorization (RMA) number.

Warranty Repair –

If you are unsure if your unit is still under warranty, we can use the unit's serial number to verify the warranty status for you over the phone. Be sure to include the RMA number on all documentation.

Non-Warranty Repair –

If your unit is out of warranty, be prepared to give us a Purchase Order number when you call. In most cases, we will be able to quote you the repair costs at that time. The repair price you are quoted will be a "Not To Exceed" price, which means that the actual repair costs may be less than the quote. Be sure to include the RMA number on all documentation.

2. Provide us with the following documentation:
 - a) A note listing the symptoms that indicate the unit needs repair
 - b) Complete shipping information for return of the equipment after repair
 - c) The name and phone number of the person to contact if questions arise at the factory
3. Use sufficient packing material and carefully pack the equipment in a sturdy shipping container.
4. Ship the equipment to the Moore Industries location nearest you.

The returned equipment will be inspected and tested at the factory. A Moore Industries representative will contact the person designated on your documentation if more information is needed. The repaired equipment, or its replacement, will be returned to you in accordance with the shipping instructions furnished in your documentation.

WARRANTY DISCLAIMER

THE COMPANY MAKES NO EXPRESS, IMPLIED OR STATUTORY WARRANTIES (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY GOODS OR SERVICES SOLD BY THE COMPANY. THE COMPANY DISCLAIMS ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR TRADE USAGE, AND ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY ACKNOWLEDGES THAT THERE ARE NO WARRANTIES IMPLIED BY CUSTOM OR USAGE IN THE TRADE OF THE BUYER AND OF THE COMPANY, AND THAT ANY PRIOR DEALINGS OF THE BUYER WITH THE COMPANY DO NOT IMPLY THAT THE COMPANY WARRANTS THE GOODS OR SERVICES IN ANY WAY.

ANY BUYER OF GOODS OR SERVICES FROM THE COMPANY AGREES WITH THE COMPANY THAT THE SOLE AND EXCLUSIVE REMEDIES FOR BREACH OF ANY WARRANTY CONCERNING THE GOODS OR SERVICES SHALL BE FOR THE COMPANY, AT ITS OPTION, TO REPAIR OR REPLACE THE GOODS OR SERVICES OR REFUND THE PURCHASE PRICE. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES EVEN IF THE COMPANY FAILS IN ANY ATTEMPT TO REMEDY DEFECTS IN THE GOODS OR SERVICES, BUT IN SUCH CASE THE BUYER SHALL BE ENTITLED TO NO MORE THAN A REFUND OF ALL MONIES PAID TO THE COMPANY BY THE BUYER FOR PURCHASE OF THE GOODS OR SERVICES.

ANY CAUSE OF ACTION FOR BREACH OF ANY WARRANTY BY THE COMPANY SHALL BE BARRED UNLESS THE COMPANY RECEIVES FROM THE BUYER A WRITTEN NOTICE OF THE ALLEGED DEFECT OR BREACH WITHIN TEN DAYS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH, AND NO ACTION FOR THE BREACH OF ANY WARRANTY SHALL BE COMMENCED BY THE BUYER ANY LATER THAN TWELVE MONTHS FROM THE EARLIEST DATE ON WHICH THE BUYER COULD REASONABLY HAVE DISCOVERED THE ALLEGED DEFECT OR BREACH.

RETURN POLICY

For a period of thirty-six (36) months from the date of shipment, and under normal conditions of use and service, Moore Industries ("The Company") will at its option replace, repair or refund the purchase price for any of its manufactured products found, upon return to the Company (transportation charges prepaid and otherwise in accordance with the return procedures established by The Company), to be defective in material or workmanship. This policy extends to the original Buyer only and not to Buyer's customers or the users of Buyer's products, unless Buyer is an engineering contractor in which case the policy shall extend to Buyer's immediate customer only. This policy shall not apply if the product has been subject to alteration, misuse, accident, neglect or improper application, installation, or operation. THE COMPANY SHALL IN NO EVENT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.



United States • info@miinet.com
Tel: (818) 894-7111 • FAX: (818) 891-2816
Australia • sales@mooreind.com.au
Tel: (02) 8536-7200 • FAX: (02) 9525-7296

Demand Moore Reliability

www.miinet.com

BeNeLux • info@mooreind.eu
Tel: 03/448.10.18 • FAX: 03/440.17.97

China • sales@mooreind.sh.cn
Tel: 86-21-62491499 • FAX: 86-21-62490635
United Kingdom • sales@mooreind.com
Tel: 01293 514488 • FAX: 01293 536852