



Isolated (TRY) & Non-Isolated (TRX)
PC-Programmable Temperature Transmitters

TRX & TRY

User's Manual

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Quick-Start

Most users familiar with a PC and Windows will not have a need for the information in this manual. Moore Industries suggests that if you do need to refer to the information here, rely heavily on the Table of Contents that follow this Quick-Start Guide.

The majority of configuration work with these transmitters can be carried out from the Main Configuration Screen of the PC Configuration Program. The menus and screen prompts are in “plain english”, and the help system should guide most users through most of the configuration procedures without any problems.

In general, the use of the TRY or TRX transmitter follows this path:

1. Installing the Configuration Software (page 10)
2. Connecting the TRY/TRX to the PC (page 10)
3. Input Connection Hookups (page 11)
4. Scale the Input (page 15)
5. Scale the Output (page 16)
6. Trim the Input (page 17)
7. Trim the Output (page 17)
8. Download the Configuration File (press PROG button)
9. Save the Configuration File to disk for future reference or use with another unit (page 22)
10. Install the unit (page 23)

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Introduction

The TRY and TRX are 2-wire (loop-powered) temperature transmitters. They are configured using a personal computer (PC) and the software program provided by Moore Industries.

About this Manual

Wherever you see a “**Note**”, “**Caution**”, or “**WARNING**” pay particular attention.

- A “**Note**” provides information to help you avoid minor inconveniences during calibration, installation, or operation of the TRY and TRX.
- A “**Caution**” provides information on steps to take in avoiding procedures and practices that could risk damage to the TRY and TRX or other equipment.
- A “**WARNING**” provides information on steps to take in avoiding procedures and practices that could pose safety risks to personnel.

The TRY & TRX

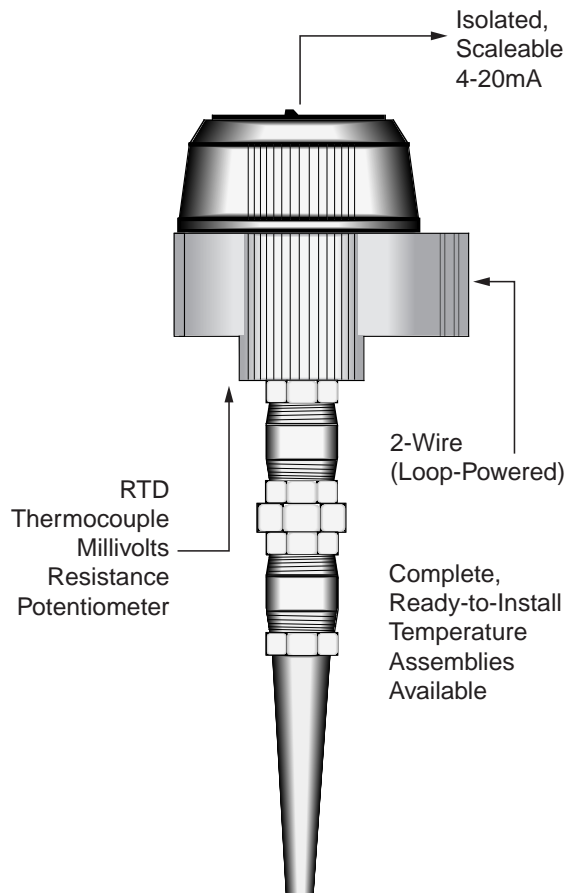
Both the TRY and the TRX transmit input from a thermocouple, or an RTD, a direct resistance or millivolt source, or a potentiometer as a linearized, scaled and offset 4-20 milliamps (mA). Their output signal is proportional (or, by user designation inversely proportional) to the input. Refer to Figure 1.

The TRY provides 1500Vrms isolation between input and output (500Vrms isolation for the DIN-style version). The TRX is a non-isolating transmitter.

Note:

Be sure to download the latest software from our website <http://www.miinet.com/>.

Figure 1. Use the PC-Programmable TRY or TRX as an interface between temperature sensors and control systems such as a DCS, PLC or PC-based control system.



TRY & TRX

Specifications

Performance **Input Accuracy:**
Refer to Table 1
Output Accuracy:
4.8µA (±0.03% of 4-20mA span)
Overall Accuracy: The 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 is in Maximum Conformance Range

Stability	Input to Output		
T/C, mV	1 yr	3 yrs	5 yrs
	0.11	0.18	0.24
RTD Ohm Pot.	0.13	0.22	0.28

Isolation: For TRY in HPP housing, 1500Vrms input to output; For TRY in DIN housing, 500Vrms input to output to case
Measurement Cycle: Output updates 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, max.
Power Supply and Load Effect: Negligible within power and load limits

Performance (Continued) Over-Voltage Protection:
4V, max, on input;
48V, max, on output;
48V reverse polarity
Load Capability:
500 ohms @ 24V, typical;

For TRY & TRX DIN:

$$\frac{(\text{Supply Voltage} - 10\text{V})}{0.024\text{A}}$$

For TRX HPP:

$$\frac{(\text{Supply Voltage} - 8\text{V})}{0.024\text{A}}$$

Burnout Protection:
Total Sensor Diagnostics user-selected via Windows configuration software;
Upscale to 24mA or downscale to 3.3mA
Output Current Limiting:
21.4mA for input overrange; 23.6mA for sensor failure or broken wire
T/C Input Impedance:
40M ohms, nominal
RTD Excitation:
250µA, ±10%
RTD Lead Wire Resistance Maximum:
RTD resistance + 2 times the lead wire resistance must be less than 4000 ohms; Recommend <35 ohms per wire for 3-wire RTD inputs; <5 ohms per wire for 10 ohms Cu inputs

Ambient Conditions **Operating & Storage Range:** -40°C to +85°C (-40°F to +185°F)
Relative Humidity:
0-95%, non-condensing
Effect of Ambient Temperature on Accuracy:
±0.015% of span/°C change, max. (+0.001% of ohms reading for RTD inputs)
Effect of Ambient Temperature on Reference Junction Compensation:
±0.015°C/°C change
RF/EMI Immunity:
20V/m @ 20-1000MHz, when tested according to SAMA standard 33.1. (10V/m @ 80-1000MHz, 1K AM, when tested according to IEC 1000-4-3-1995)
Common Mode Rejection:
100dB, min., @ 50/60Hz
Normal Mode Rejection:
100dB, typical, @ 1V peak-to-peak, 50/60Hz

Adjustments All settings made using Windows®-based configuration program, then stored in non-volatile memory

Weight **HPP-style housing:**
65g (2.3 oz)
DIN-style housing:
184g (6.5 oz)
LH housing styles:
549 g (19.4 oz)

Specifications and Information subject to change without notice

Default Factory Configuration for TRX

Input: RTD, 4-wire Pt3850, 100 ohms, 0-100°C
Filter: 60Hz
Broken Wire: ON
Input Trim: OFF
Output: 4-20mA
Sensor Failure: Up 24mA
Damping: 0s

Default Factory Configuration for TRY

Input: RTD, 4-wire Pt3850, 100 ohms, 0-100°C
Filter: 60Hz
Broken Wire: ON
Input Trim: OFF
AO: 4-20mA
Sensor Failure: Up 24mA
Damping: 0s

Table 1. Input Types, Ranges, Minimum Span and Maximum Range Specifications, and Accuracy of the TRY and TRX

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 100 ohm inputs 10°C (18°F) for 200 ohm inputs 7.5°C (13.5°F) for 500 and 1000 ohm in- puts	±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	0-4000 ohms	30 ohms	±0.4 ohms		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
		n/a	n/a	-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
		n/a	n/a	-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
		n/a	n/a	-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
		n/a	n/a	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
		n/a	n/a	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
		n/a	n/a	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
		n/a	n/a	-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
		n/a	n/a	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
Millivolts	DC	n/a	n/a	-50 to 1000mV	4mV	±0.04mV		-50 to 1000mV

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

TRY & TRX

Ordering Information

Unit	Input	Output	Power	Options	Housing
TRY Isolated, PC-Program-mable Temperature Transmitter	PRG Program-mable with supplied Configuration Software (see Table 1 for descriptions of available input types; Factory Configuration available)	4-20MA User scaleable with supplied software	10-42DC 10-30DC Required for -ISA, -ISC, -ISE and -ISF options (IS option not available with [DIN] housing)	-ISA TestSafe approved IS (ANZEx) -ISC (**) CSA approved IS and NI -ISE (**) ATEX approved IS -ISF (**) FM approved IS and NI -FMEDA Unit comes with Failure Modes, Effects and Diagnostic Analysis (FMEDA) data for evaluating the instrument for suitability of use in a safety-related application (TRY Only)	DIN DIN-style aluminum housing mounts on 32mm G-type (EN50035) and 35mm Top Hat (EN50022) rails HPP Hockey-puck housing for mounting in standard connection heads LH1NS‡ Aluminium IP 66 connection head with two entry ports: ½-inch NPT cable and process–black polycarbonate cover LH1MS‡ Aluminium IP 66 connection head with two entry ports: M20 cable and ½-inch NPT process–black polycarbonate cover LH1CS‡ Aluminium IP 66 connection head with two entry ports: M20 cable and G½ (BSP) process–black polycarbonate cover LH1NX Aluminium IP 66 connection head with ½-inch NPT entry and mounting plate for customer’s air duct opening–black polycarbonate cover LH2NS(*) or (‡) Aluminum Explosion-proof/Flameproof connection head with two entry ports: ½-inch NPT cable and process–black metal cover LH2MS(*) or (‡) Aluminum Explosion-proof/Flameproof connection head with two entry ports: M20 cable and ½-inch NPT process–black metal cover
TRX Non-Isolated, PC-Program-mable Temperature Transmitter	PRG Program-mable with supplied Configuration Software (see Table 1 for descriptions of available input types; Factory Configuration available)	4-20MA User scaleable with supplied software	8-42DC 8-30DC Required for -ISA, -ISC, -ISE, and -ISF options (IS option not available with [DIN] housing) 10-42DC (DIN housing ONLY)		* Either A or E suffix (comes supplied with 2" pipe mount hardware) A suffix indicates ANZEx/TestSafe (Ex d) Flameproof approvals (i.e. BH2MGA) E suffix indicates ATEX (Ex d and tb) Flameproof approvals (i.e. BH2MGE) ** IS option not available with [DIN] housing ‡ P suffix indicates enclosure comes equipped with base plate and U-bolts for mounting on a 2-inch pipe (i.e. BH2NGP) See BH, SB and D-BOX Datasheets for additional information.

When Ordering, specify: Unit/Input/Output/Power/Option(s) [Housing]
Model number example: TRY/PRG/4-20MA/10-30DC/-ISF [LH2MSP]

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 TRY or TRX, 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 TRY or TRX order comes with one copy of our Configuration Software. Requirements: Microsoft Windows based PC; 16Mb free RAM; 20MB free disk space on hard drive, Windows XP, 7, and 10 compatible; 1 serial port or USB port (with optional cable).

To order additional or replacement 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. USB cable P/N 804-030-26

Configuring a TRY/TRX

One of the benefits of the TRY and TRX transmitters is their easy-to-use PC Configuration Program; there are no internal or external controls to adjust or jumpers 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 (EEPROM) over a connection between the PC's serial (or USB) port and a COM port on the transmitter.

This section of the manual contains instructions for configuring the TRY or TRX:

- Installing the Software (page 6)
- Saving the Default Configuration (page 9) (Keeping What You've Got Safe)
- Selecting Input Type, Wiring Configuration, etc. (page 10)
- Scaling the Input/Setting Reverse Output (page 11)
- Scaling the Output (page 12)
- Trimming the Input (page 13)
- Trimming the Output (page 13)
- 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 (page 14)
- Setting Output Damping, Using the Loop Test (page 15)
- Creating Custom Linearization Tables (page 16)
- Managing Configuration Files (page 18)

What is First

First, it is necessary to install the 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 TRY or TRX 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 TRY or TRX 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 transmitter **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'", on page 9)

TRY & TRX

Installing the Configuration Software

Refer to Table below for the equipment needed.

1. Download the latest configuration software from our website or use the Moore Industry CD and open the “TRX TRY SDY SIY TDY 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 TRX/TRY can be connected to equipment to simulate input and monitor output. This makes it easy to create a set of operating parameters, save them to disk, and download them to one or more instruments at a later time.

Gathering the Equipment Needed

It is possible to create a Configuration File for a transmitter without ever connecting the transmitter to a PC. Most TRY or TRX operating parameters can be set up, 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 1 lists the things needed to setup the TRY or TRX as shown in Figure 2.

Note:

Be sure to use calibrated test equipment when performing any trimming operations on the TRY or TRX. 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.

Connecting the TRY or TRX to the PC

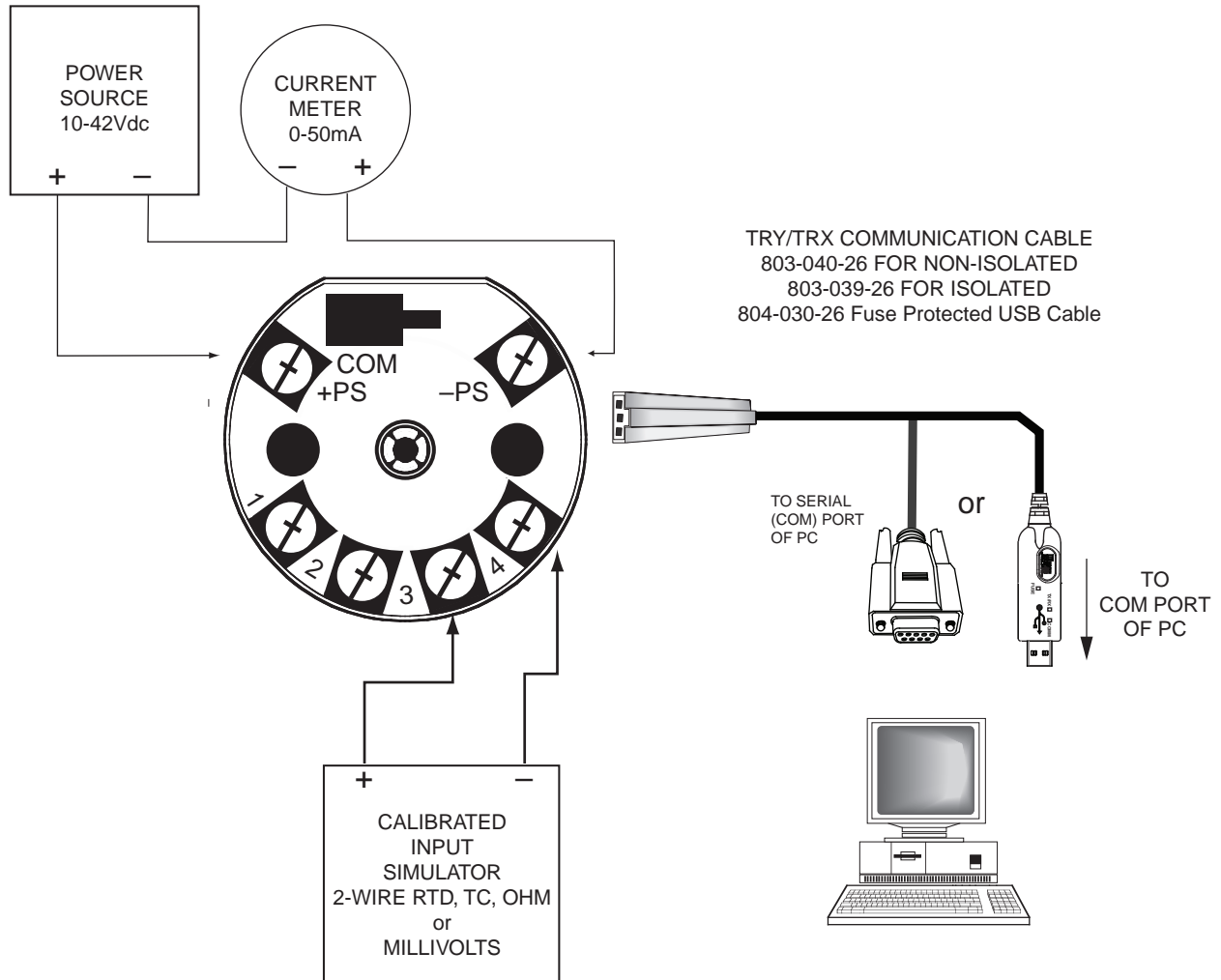
Connect one end of the cable to the PC's serial or USB port.

See Table 1 for information on the necessary equipment.

Table 1. Assembling the equipment needed to configure the TRX or TRY

Device	Specifications
Current or Voltage Source	Accurate to 0.05% of span for the intended application
Power Supply	10-42Vdc, $\pm 10\%$
Multimeter (optional)	Accurate to $\pm 0.025\%$; e.g., Fluke Model 87
Precision Load Resistor (optional)	Accurate to $\pm 0.025\%$;
Personal Computer	Microsoft Windows based PC; 16Mb free RAM; 20MB free disk space on hard drive; Microsoft Windows XP, 7 or 10; and 1 serial port or USB port (with optional cable)
Moore Industries PC Configuration Software	Version 4.5 or greater, successfully installed to the hard drive
Communication Cable	Non-Isolating 803-040-26, Isolating 803-039-26, or Fuse Protected USB Cable (PN 804-030-26)

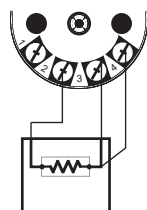
Figure 2. Use the PC Configuration Software to program the TRY or TRX.



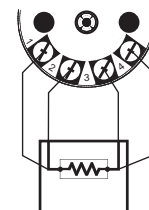
Input Connection Hookups



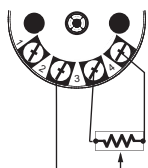
2-WIRE RTD
OR
RESISTANCE INPUT



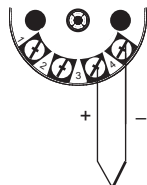
3-WIRE RTD
OR
RESISTANCE INPUT



4-WIRE RTD
OR
RESISTANCE INPUT



POTENTIOMETER
INPUT



THERMOCOUPLE
INPUT

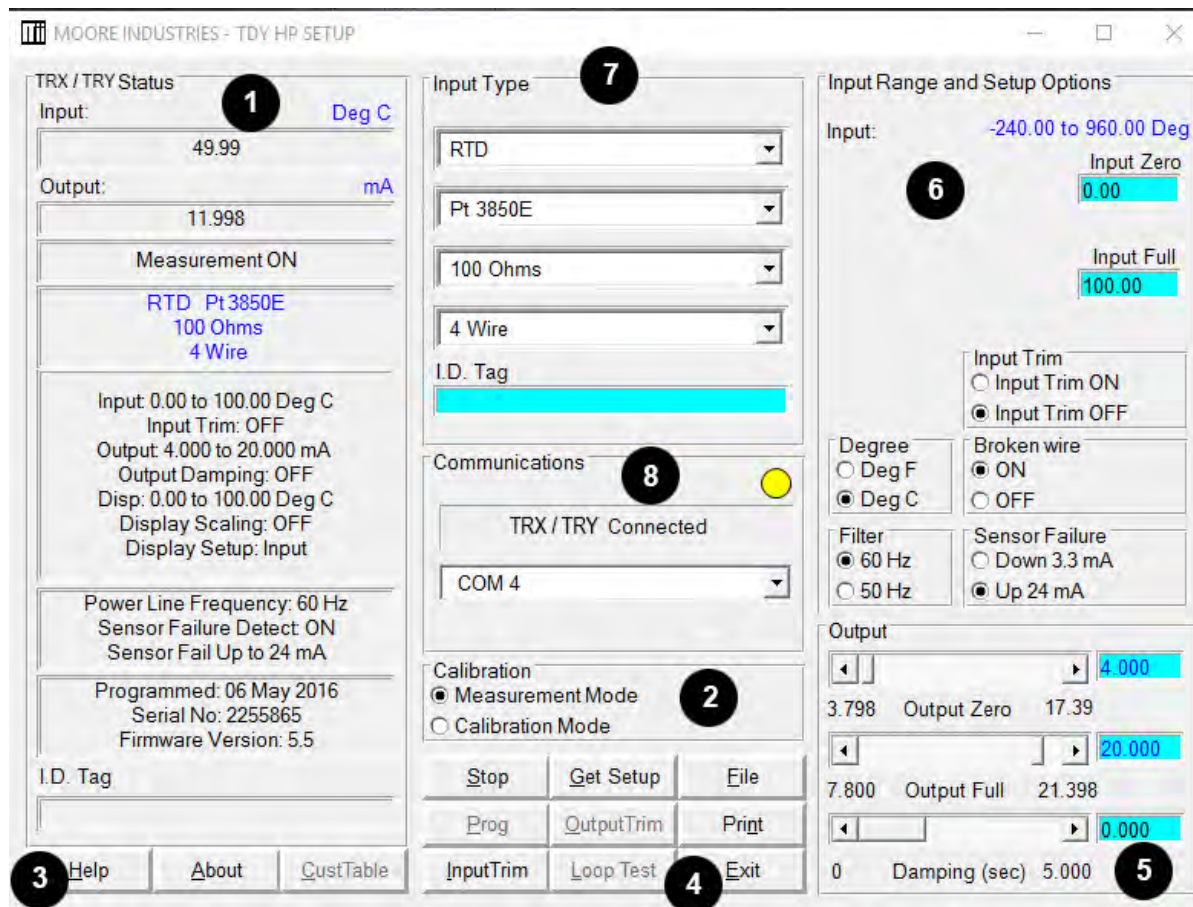


MILLIVOLT
INPUT

TRY & TRX

PC Configuration Software Summary

Figure 3. Main Configuration Screen Summary



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

2. Calibration Use these radio buttons to change from “Measurement Mode”, the mode that you will be working in from your PC, 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 TRY or TRX Configuration Software. The “CustTable” button allows you to set up a custom linearization table for your unit.

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 Controls the scaling and damping values of the TRY or TRX. 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 transmitter’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 TRY or TRX 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 TRY or TRX: 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 transmitter is connected.

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

Every TRY or TRX 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 TRY or TRX 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 Main Configuration Screen.

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

1. Start the PC Configuration Program, making sure that the transmitter 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 a dialog box, click on the “Save File” button.
4. In the popup window, enter a name for the current Configuration File and click on the “Save” button.

Note:
The Configuration Program adds a suffix to the file name automatically.
5. The “starting point” of the TRY or TRX Configuration Process is now saved on the PC drive. If you decide to edit the configuration, this file can always be opened to restore the previous parameters.

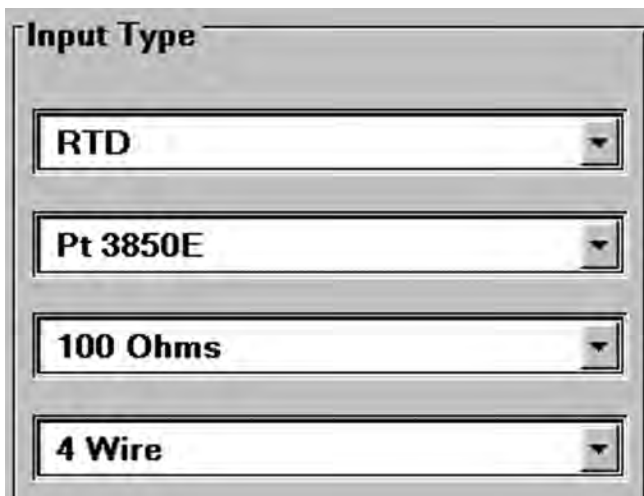
TRY & TRX

Selecting Input Type, Wiring, etc.

Use the selection tools in the *Input Type* box to choose the sensor type that the TRY or TRX 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).

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 TRY or TR



The image shows a software interface titled "Input Type" with four vertically stacked 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 its right side.

Note:

The 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. For RTD and TC applications all curves are stored in the installation directory as files.

IMPORTANT:

Settings on the Main Configuration Screen do not take effect in the unit until the Configuration File is downloaded.

Note:

Once you have completed all parameters you wish to configure, please refer to “Applying Configuration Settings to your Transmitter.”

Scaling the Input

This parameter allows the user to set the TRY or TRX to scale its output in response to a portion of the total range of the selected input type. In a reverse output application, the TRY or TRX 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 TRY or TRX:

1. Start the PC Configuration program and connect a transmitter. Press the "Get Setup" button to display the transmitter's current configuration.

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), select the "Input Zero" box in the upper right corner of the screen.
3. Enter the desired 0% input value into the "Input Zero" value box.
4. Repeat the above step to set the desired 100% input value in the "Input Full" box.

Any value which falls within the range of the selected measurement type may be used for "Input Zero" and "Input Full" percentages

IMPORTANT:

Settings on the Main Configuration Screen do not take effect in the unit until the Configuration File is downloaded.

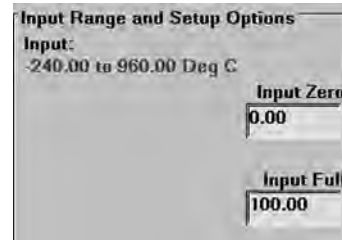
Note:

Once you have completed all parameters you wish to configure, please refer to "Applying Configuration Settings to your Transmitter."

Setting Reverse Output

- a. Select the "Input Zero" box (Figure 5).

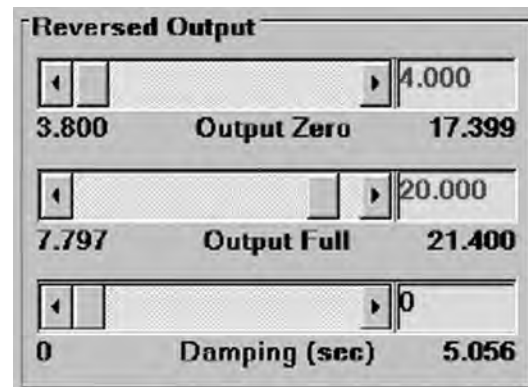
Figure 5. The Input Zero/Full menu



- 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. Scale the output or set the Reversed Output using the bars in the bottom right of the Main Configuration Screen.



TRY & TRX

Scaling the Output

The TRY or TRX 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. 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 of the TRY or TRX:

1. Start the PC Configuration program and connect a TRY or TRX as shown in Figure 2. Press the "Get Setup" button to display the transmitter's current configuration.

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 "Output Zero" box at the lower right corner of the screen (see Figure 6), 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 "Output Full" 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.

Applying Configuration Settings to Your Transmitter

1. Select one of these options:
 - a. Create a Configuration File by setting different parameters.
 - b. Save the current settings into a file on disk as a back-up or to download later. Refer to "Keeping What You've Got Safe", starting with Step 3.

- c. Download the current settings into memory

2. To enable 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 screen to the memory of the connected transmitter.

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.

3. 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.

CAUTION:

Any time a connected TRY or TRX 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.

IMPORTANT:

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

Trimming the Input

Use this feature 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 input by following the directions below:

Note:

The “Input Trim” procedure may require several hours for completion. Please determine whether or not your process requires this function before proceeding.

1. Connect the transmitter to your PC using the setup shown in Figure 2. Press the “Get Setup” button to display the transmitter’s current configuration.
2. Click “Start”, then “InputTrim”.
3. Click the radio button labeled “Input Trim On”.
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 Low” and “Trim Upp” 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 settles. Click “Trim Low” and wait for it to capture the value (about 10 seconds).
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 settles. Click “Trim Upp” and wait for it to capture the value (about 10 seconds).

Caution:

If planning on beginning a new task, ensure that you have saved your lower trim value of your Input Trim before proceeding to Steps 8 and 9.

8. Click on the button labeled “QuitTrim”, then the “Stop” button, and finally the “Prog” button to send the trim values to the transmitter.
9. Click on the “Start” button to re-enable the Configuration Program’s monitoring of the connected transmitter.

Trimming the Output

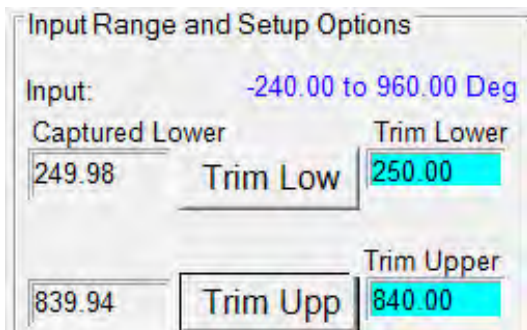
Trimming is the function that allows precise control over the transmitter’s output. Note that to activate this function, a unit must be connected as shown in Figure 2.

To trim TRY or TRX output:

1. Set all unit parameters on the TRY or TRX 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 “OutputTrim”. Monitor the output with a calibrated current meter or with a voltmeter measuring the drop across a precision 250 Ohm resistor (see Figure 2).
3. While monitoring your meter, select and move the “Output Zero” or the “Output Full” slide bar to adjust the TRY or TRX output .
4. When both zero and full scale have been adjusted to satisfaction, press “QuitTrim”, then “Prog” to program the transmitter with the new trim values.

Figure 9. Trim Capture Box



The “TRY or TRX Status” area of the Configuration Screen will reflect the new output settings.

TRY & TRX

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

There are several “radio buttons” on the PC 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 display the Celsius 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.

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 TRY and TRX transmitters 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 3.6mA 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 TRY or TRX will only output 24mA or 3.6mA (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 TRY or TRX 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 “TRY/TRX 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 input sources. To temporarily disable this feature when the TRY or TRX is working in a millivolt input configuration, select the “Broken Wire Off” radio button.

Working with a Thermocouple or RTD Input

Total Sensor Diagnostics can also cause problems with some types of temperature calibrators.

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.

Setting Output Damping

The Output Damping function allows the user to introduce a delay into the response of the transmitter in order to minimize the effect of step output changes. The higher the damping value (set in seconds), the longer the TRY or TRX 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 in which damping is off. The maximum allowable damping value is 5.000 seconds.

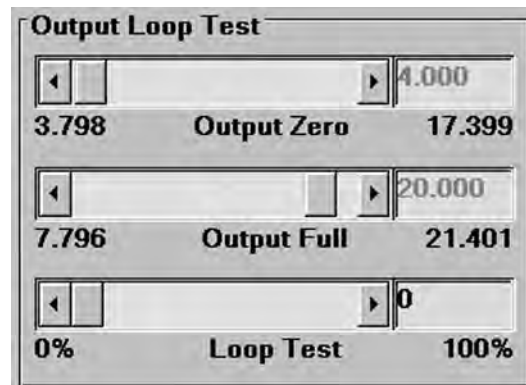
Using the Loop Test

The 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 TRY or TRX 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 TRY or TRX 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 bar



TRY & TRX

Creating a Custom Linearization Table

The TRY or TRX supports user-defined linearization of mV 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). A Custom Linearization Curve is used for mV inputs only.

This section explains how to create a Custom Linearization Table for downloading into TRY or TRX 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:

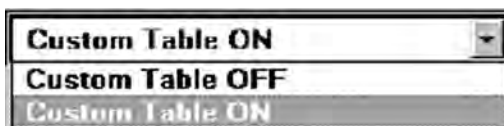
1. Attach the equipment listed in Table 1 as shown in Figure 2 and start the PC Configuration Program.

Note:

Connect the unit to a PC in order to create a Custom Linearization Table. You may work On or Off-Line.

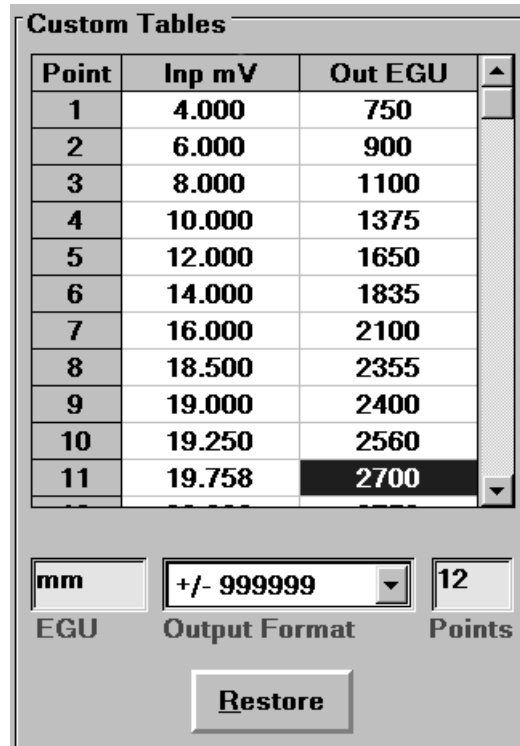
2. Use the pull-down menu to set "Linearization ON". Then click the "CustTab1" button in the lower-left area of the Main Configuration Screen.

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



3. Click on the "CustTab1" (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.
5. Use the "EGU" field to set the Engineering units of the readout from the transmitter when connected to the Configuration Program.

CAUTION:

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

6. Set the "Output Format" field to the desired resolution using the pull-down menu.
7. Enter the number of points to use to constitute the Linearization Table in the "Points" field.
8. You can create a custom table in Microsoft Excel® or other spreadsheet editor then import it into the Custom Curve via the "Import" button. Be sure to save your custom curve as a .CSV file and follow these guidelines:
 - No labels, just data
 - Only one X, Y pair per row
 - No spaces
 - Only up to 85 points allowed
9. You can also export the custom curve to a CSV file by clicking on the "Export" button.

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.

Note:

Values in the “X data” column must be in ascending order and must fall within a range of -50 to 1000 mV.

- One “Y data” value per “X data” value only.

Note:

Values in the “X data” column must fall within a range of ±999999. The output must be scaled to your “X data” Table range.

- 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.

10. When the table is complete, click on the “Quit-Table” button and answer “Yes” on the pop-up dialog box. You may save the configuration to a file whether you are On or Off-Line.
11. Click on the “Prog” (Program) button to download the output trim settings into the transmitter memory.

CAUTION:

Any time a connected TRY or TRX 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.

TRY & TRX

Managing Configuration Files

Once all the parameters for a transmitter are set, they can be saved to disk on the PC using the File Dialog.

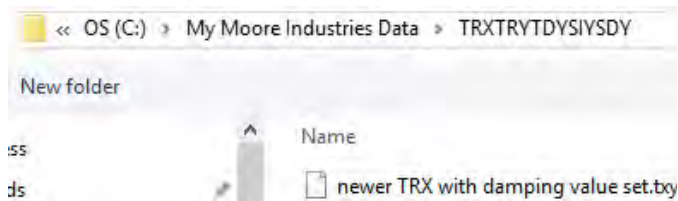
Saving a Configuration File to Disk

1. Click on the “File” Button. Click on “Open File” on the popup dialog that is shown.
2. Enter the file name then select the location for the save file.
3. Click on “Save”

Note:

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

Figure 13. The File Menu.



Retrieving a Configuration File from Disk

1. Click on the “File” Button. Click on “Save File” on the popup dialog that is shown.
 2. Select the file you would like to open.
 3. Click on “Open”
- You may also edit the screen configuration and save it to another file.

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 TRY or TRX.

Retrieving a Configuration File from the Connected TRY or TRX

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

The Main Configuration 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.

Note:

Connection to another device will not change the Configuration Screen. This is beneficial when you must configure several devices with the same configuration. In this case you would simply configure the unit and click the “Stop” button and then the “Prog” button. If no sensor is connected during configuration download, click the “Stop BW” button and then the “Prog” button.

Printing Saved Configurations

1. Click on the "Print" button, this will bring up a dialog with some print options.
2. Click on "Print Preview" if you would like to see a preview of the printout.
3. Click on "Print Setup" if you would like to change the printer or other print settings.
4. Click on "Print" when ready to print.

Note:

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

The TRY and TRX are available in both DIN and HPP housing styles, and are available with a number of enclosure options. Consult your local Moore Industries' Interface Solutions Expert for information on the type of enclosure that best suits your application.

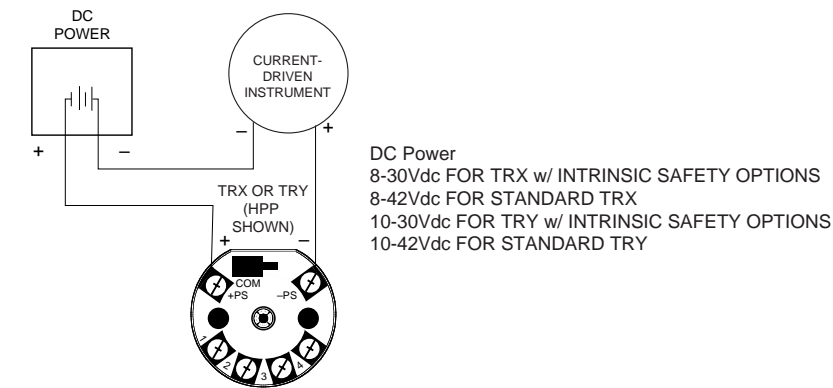
Connecting the TRY or TRX in an Application

Moore Industries suggests installing the TRY or TRX 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.

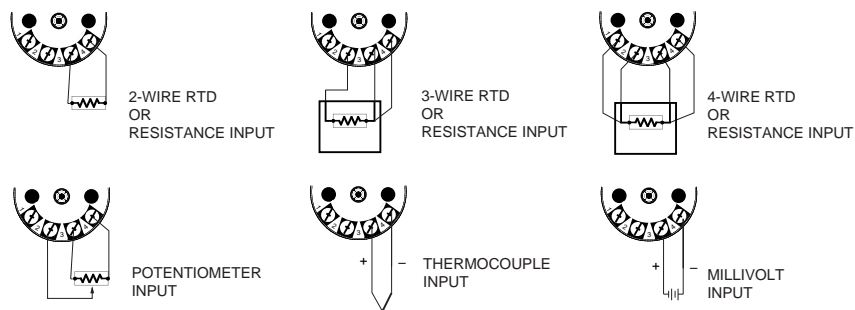
Installing and Connecting the TRY or TRX

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

Figure 14. Connecting the TRX or TRY to the loop.



Input Connection Hookups



TRY & TRX

Figure 15. The Dimensions of the DIN housing for the TRY or TRX unit.

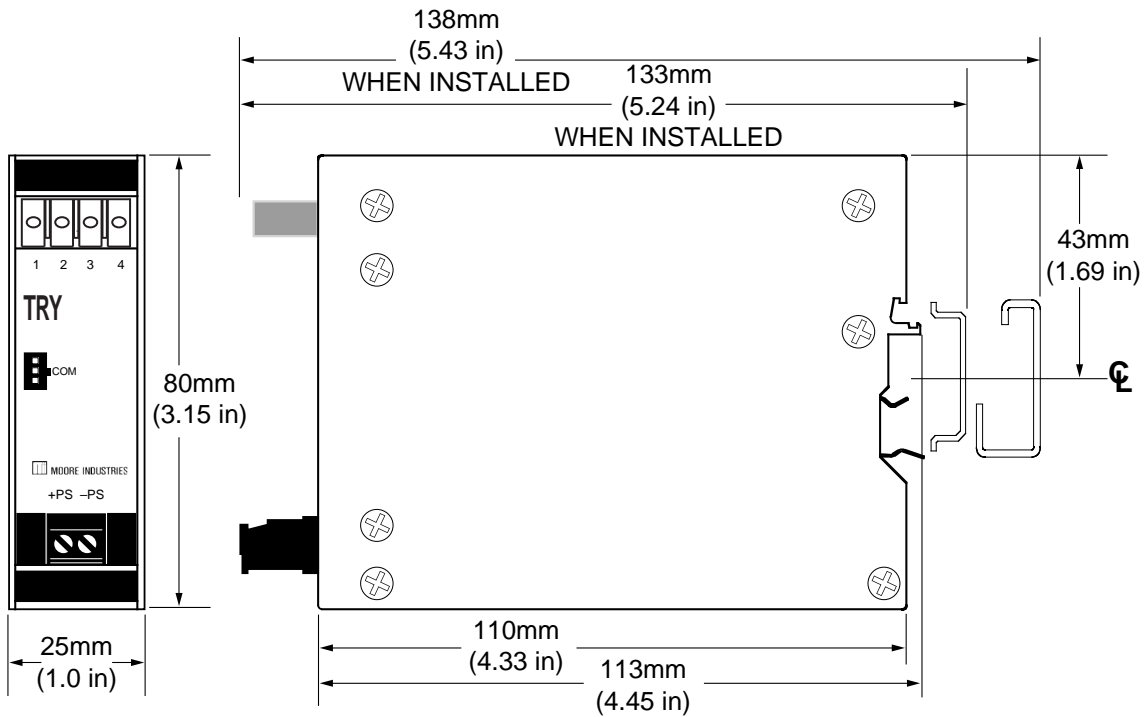
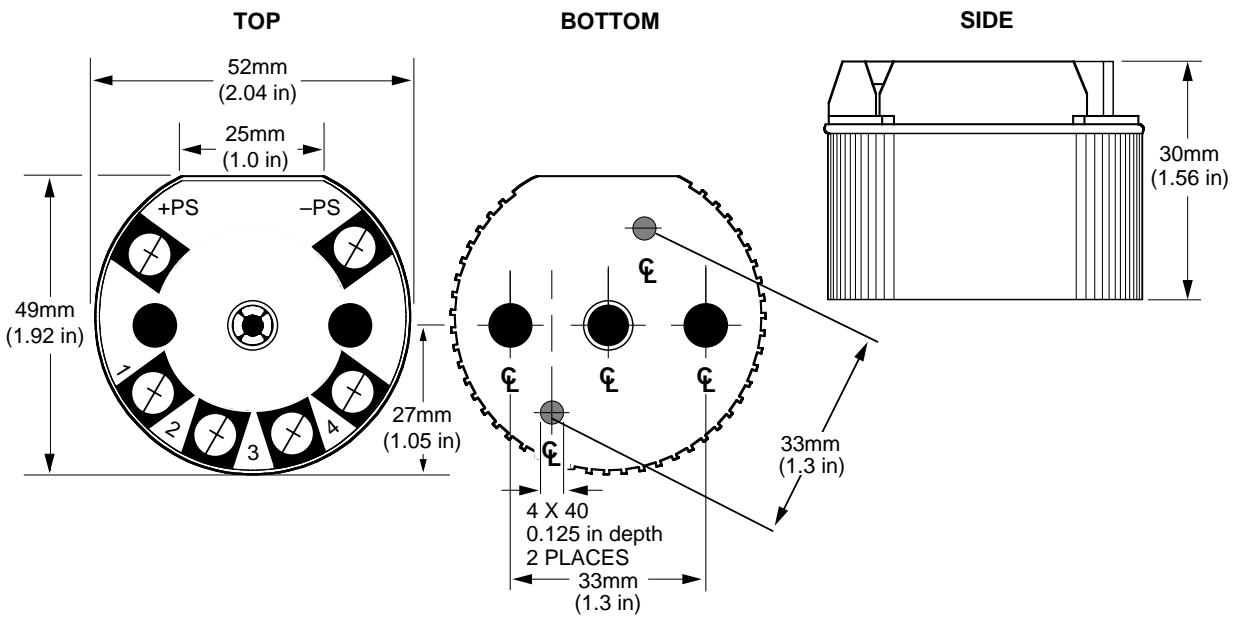


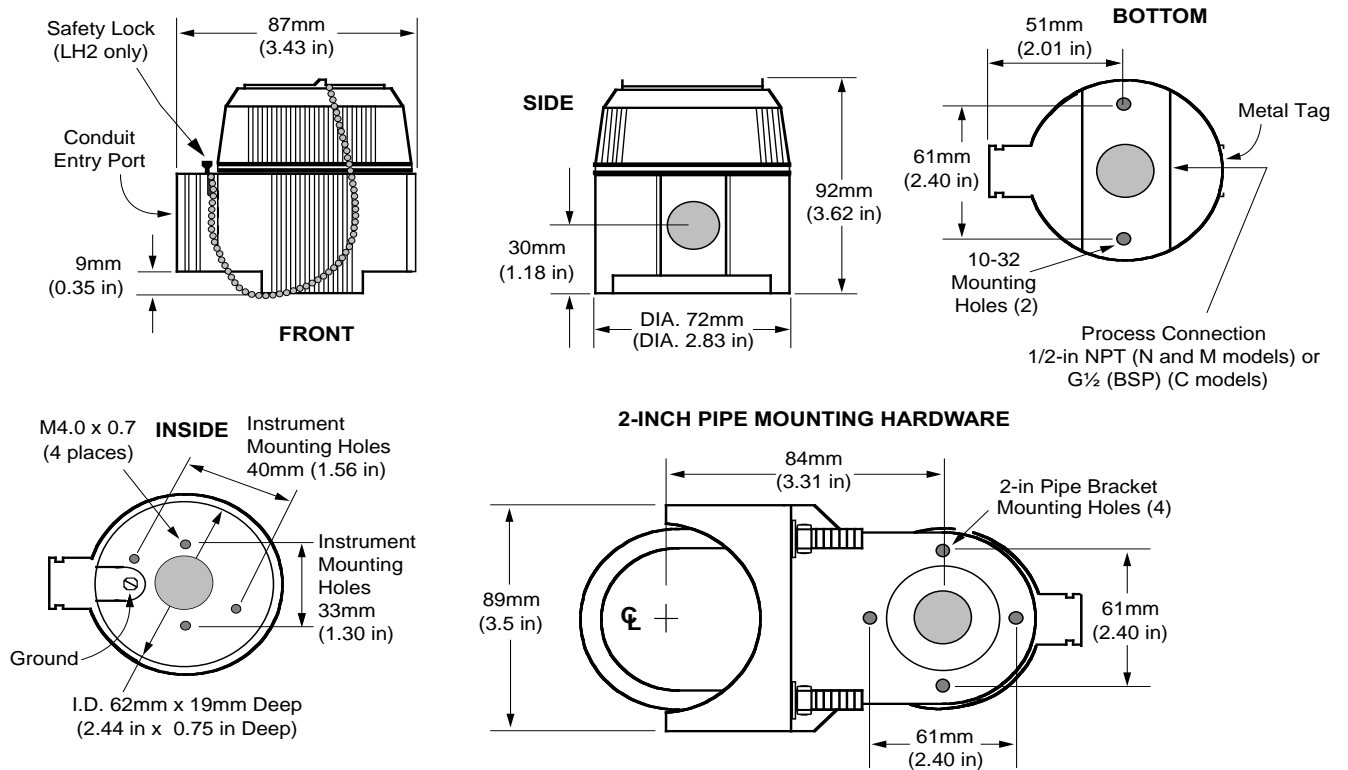
Figure 16. The Dimensions of the TRY or TRX HPP housing.



Electrical Safety Information

Refer to the Electrical Safety Manual included at the end of this manual, also available as a separate document

Figure 17. The Dimensions of the explosion-proof housing for the TRY or TRX unit.



Operating the TRY/TRX

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

Maintaining the TRY/TRX

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 TRY/TRX

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 reperform 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 TRY or TRX. 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 TRY or TRX, 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)

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

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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.



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TRX & TRY ELECTRICAL SAFETY MANUAL

July 2020
235-701-09A

Electrical Safety Manual

This document allows the user quick access to all electrical information for the purpose of safety installation in a specific area. The Electrical Safety Manual does not replace the full manual that is included with the unit; refer to the full manual for additional details on specification, unit configuration, customer service, warranty, and more.

Safety Messages

All Moore Industries instrumentation should only be used for the purpose and in the manner described in both manuals. If you use this product in a manner other than that for which it was intended, unpredictable behavior could ensue with possible hazardous consequences.

Qualified Personnel

The Moore Industries' product/systems described in the manuals may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these Moore Industries' products/systems.

Proper Use of Moore Industries Products

Moore Industries' products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Moore Industries'. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Installation and Wiring

Instructions in this section and others may require special precautions to ensure the safety of the personnel performing the operations. Notes, Cautions and Warnings that may cause potential safety issues are indicated throughout this guide.

Note: Make sure to calibrate and bench check the instruments prior to installation. Also, install all instruments in their intended application before making any electrical connections. For DIN rail mounted instruments, allow enough room for pivoting instruments vertically on the rail for removal in applications involving multiple banks of units. To remove the unit from the DIN rail you will need a simple tool such as a straight blade screwdriver. Insert the blade of the screwdriver into the cavity at the bottom of the locking mechanism and rotate it. This will release the locking mechanism from the DIN rail and allow you to remove the unit.

Moore Industries suggests installing by first mounting the unit in its intended application, then making the electrical connections to input, output, and power.

The HPP housing includes a metal mounting plate secured to the bottom. The case is designed to fit inside the popular 30-35 mm connection head. The DIN-style housing can be mounted on either 32 mm, G-type DIN rail (EN50035), or 35mm, Top Hat rail (EN50022). The DIN-housed unit is also equipped with removable terminal blocks.

Electrical Connections

When installing any Moore Industries product, always follow all local regulations and standards for grounding, shielding, and safety. Use +90°C suitable wiring for all connections.

WARNING: Terminals on this unit may be connected to hazardous voltages. Before making ANY connections to this unit, always remove power from the loop or instrument power terminals.

WARNING: If this unit is used in a manner not specified by Moore Industries, the protection provided by the equipment may be impaired.

Input/Output Wiring

The input/output connections can be made with 14 to 24 AWG (2.5mm² to 0.2mm²) wire. The end of each conductor should be stripped no more than 0.25in (7mm). Tighten the screws on the terminal block to 4.4 - 5.3 lbf/in² (0.5 - 0.6 N/m²).

Power Supply Wiring

All power connections should be made with 14 or 16 AWG (2mm² or 1.3mm²) wire. The end of each conductor should be stripped no more than 0.25in (7mm). The end of the stripped wire should be tinned with solder, or inserted into a ferrule and crimped before being placed into a terminal block. Tighten the screws on the terminal block to 4.4 - 5.3 lbf/in² (0.5 - 0.6 N/m²).

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 un-shielded input and output signal wiring should be 2 inches.

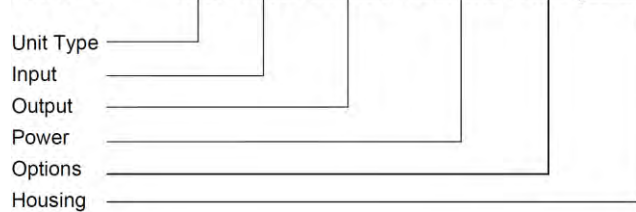
Note: Some of Moore Industries' instruments can be classified as receivers (IPT2, IPX2, etc.) and some can be classified as transmitters (TRX, TRY, etc.) while some are both a receiver and a transmitter (SPA2, HIM, etc). Hence, your shield ground connections should be appropriate for the type of signal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

CE Certification-related Guidelines

The grounding and wiring practices described above must be followed in order for the unit(s) to meet the requirements set forth in EMC standard EN 61326.

Model Structure

EXAMPLE TRY / PRG / 4-20MA / 10-30DC / -ISF [LH2MSP]



Specifications

Parameters:

Standard Nominal:

TRX: 8-42Vdc, 24mA max.

TRY: 10-42Vdc, 24mA max.

Intrinsically Safe:

TRX and TRY: $U_i = 30Vdc$, $I_i = 110mA$, $P_i = 825mW$

Terminals:

Rated CAT I

Operating & Storage Range:

-40°C to +85°C (-40°F to +185°F)

Installation in Hazardous Locations

This section contains important information regarding installation of TRX and TRY in Hazardous Area Locations.

Note: The TRY-DIN is suitable for use in Non-Hazardous locations only. See cCSAus installations

WARNING: Do not separate power connector when energized.

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

AVERTISSEMENT: La substitution de composants peut compromettre la sécurité intrinsèque.

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

AVERTISSEMENT: Risque d'explosion. Avant de déconnecter l'équipement, couper le courant ou s'assurer que débrancher tant que l'emplacement est désigné non dangereux.

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

AVERTISSEMENT: Risque d'explosion. Ne pas débrancher tant que le circuit est sous tension, a moins qu'il ne s'agisse d'un emplacement non dangereux.

WARNING: Explosion Hazard. Substitution of components may impair suitability for Class I, Division 2.

AVERTISSEMENT: Risque d'explosion. La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de Classe I, Division 2

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

Specific Conditions of Use

The following instructions must be adhered to when the TRX and TRY are used in hazardous locations and potentially explosive atmospheres.

FM Installations

Intrinsically Safe Applications

Class I, Division 1, Groups A, B, C & D T6

Class I, Zone 0, AEX ia IIC T6 Ga

Nonincendive Applications

Class I, Division 2, Groups A, B, C & D T6

Operating Ambient Temperature Range:

-40°C ≤ T_{amb} ≤ +60°C

When installed as Division 1 or Zone 0 equipment, install per I.S. Control Drawing 100-100-38 (TRX) or 100-100-49 (TRY).

The TRX and TRY shall be mounted within a tool-secured enclosure which meets the requirements of ANSI/UL 61010-1 and is capable of accepting applicable wiring methods per the NEC*. The enclosure shall have a minimum type of protection IP20, but shall have a suitable degree of protection against deterioration of the equipment that would adversely affect its suitability for use in Class I, Division 1, Zone 0 or Division 2 locations.

No connections shall be made to the communications "COM" port in Hazardous (Classified) Locations.

Programming through the communication port shall only be done in the unclassified location using the Moore Industries USB cable, Part No. 804-030-26.

CSA Installations

Intrinsically Safe Applications

Class I, Division 1, Groups A-D

Nonincendive Applications

Class I, Division 2, Groups A-D

The models TRX and TRY are of open type unit Certified as a component for use only in other equipment where the suitability of the combination is to be determined by the authority having jurisdiction.

European Union Installations (ATEX 2014/34/EU)

Intrinsically Safe Applications - Zone 1 II 2 G EEx ib IIC T6 or EEx ib IIB T6

Install per I.S. Control Drawing 100-100-38 (TRX) or 100-100-49 (TRY).

The apparatus is intrinsically safe. It can be used in potentially explosive atmospheres. The equipment must only be associated with certified intrinsically safe associated apparatus and these combinations must be compatible as regards to intrinsic safety.

The electrical parameters of the certified associated intrinsically safe apparatus must not exceed any of the following values: (terminals, +ps, -ps) $U_o \leq 30V$; $I_o \leq 110mA$; $P_o \leq 0.82W$.

The "COM" port must not be used in hazardous areas.

Operating ambient temperature: -40°C to +60°C

Australia New Zealand ANZEx Installations

Intrinsically Safe Applications – Zone 0

Ex ia IIC T5 @ +85°C

Certificate No. ANZEx 09.3020X

Applicable Standards:

AS/NZS 60079.0:2005 Electrical equipment for explosive gas atmospheres – Part 0 General requirements (including Amendment 1)

AS/NZS 60079.11:2006 Explosive atmospheres – Part 11: Equipment protection by Intrinsic Safety "i"

AS 60529:2004 Degree of protection provided by enclosure (IP code)

Install per I.S. Control Drawing 100-100-38 (TRX) or 100-100-49 (TRY).

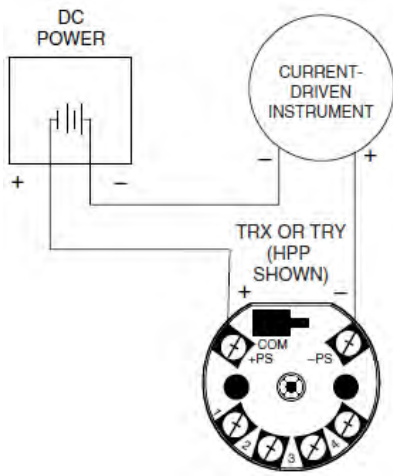
When the TRX and TRY are used in a Zone 0 environment it is a condition of safe use that the equipment shall carry a warning on the potential of electrostatic charging.

cCSAus Installations General Locations

The equipment is certified only for use in other equipment where the suitability of the combination is to be determined.

Connection Diagram

Connecting the TRX or TRY to the loop



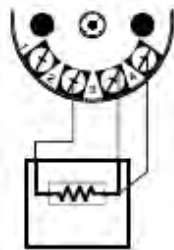
DC Power
 8-30Vdc FOR TRX w/ INTRINSIC SAFETY OPTIONS
 8-42Vdc FOR STANDARD TRX
 10-30Vdc FOR TRY w/ INTRINSIC SAFETY OPTIONS
 10-42Vdc FOR STANDARD TRY



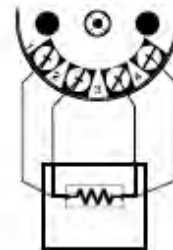
Input hookups



2-WIRE RTD
 OR
 RESISTANCE INPUT



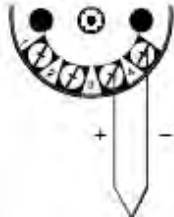
3-WIRE RTD
 OR
 RESISTANCE INPUT



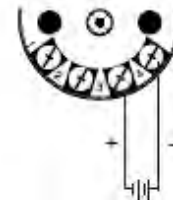
4-WIRE RTD
 OR
 RESISTANCE INPUT



POTENTIOMETER
 INPUT



THERMOCOUPLE
 INPUT



MILLIVOLT
 INPUT

DO NOT SCALE DRAWING

TOLERANCES (UNLESS NOTED) DECIMALS = digit/mm X .1 12.54 XX .03 0.76 XXX .00125 HOLES ±.005/+.13 ANGLES ±.30°	DRAWN	Gus H. Elias	09/00
	CHECKED	W. Ho	02/03
	ENGINEER	Gus H. Elias	09/00
	SCALE	NONE	

CATEGORY CONTROL DRAWING

TITLE	Field Installation Diagram: TRX & TX2 [HPP] Non-Isolated PC-Prog. Temp. Xmitters. Intrinsically Safe System For Hazardous "Classified" Locations
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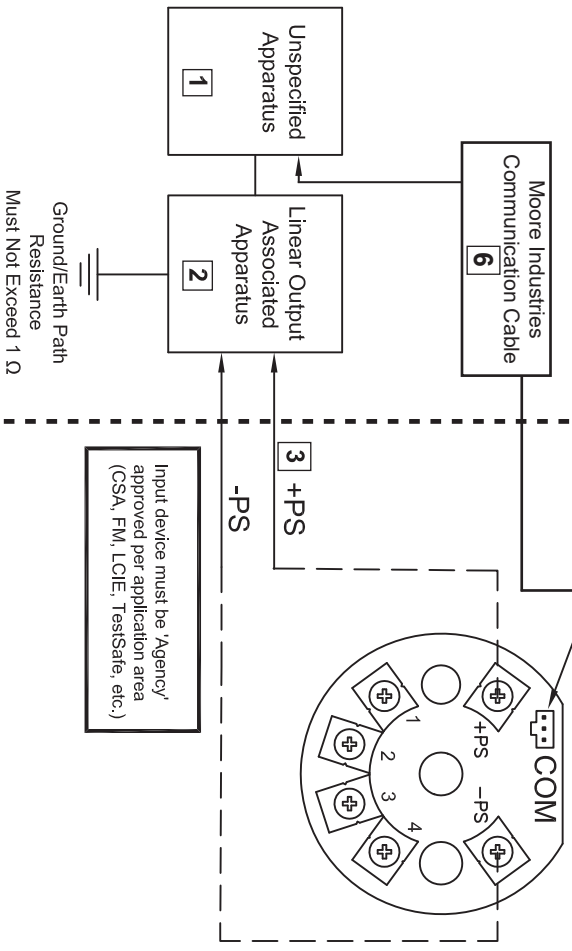
DRAWING NUMBER 100-100-38

REVISED BY	ECO 18886	DATE	07/20	BY	T.G. W.T.	APPROVAL	E
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Non-Hazardous (Safe) Area



Installation Notes:

- Associated apparatus which is unspecified except that it **must not** be supplied from, or contain under normal or abnormal conditions a source of potential with respect to earth in excess of 250 Vrms or 250 Vdc which is considered to be the Safe Area's maximum voltage.
 - The Barrier or other Associated Apparatus **must** be approved by the "specific" (CSA/FM/LClE, etc.) certifying agency for I.S. connections in: "Class I, Division 1, Groups A, B, C & D" locations. The output voltage **6.2 Vdc 5 (Voc, V_L or U₀) 5 30 Vdc** & the output current (**I_{sc}, I_t or I₀) must not exceed 110 mA**. Also, it **must** be installed per the manufacturer's guidelines. *A Shunt Zener Barrier is NOT required for Non-Incendive (or Class I, Division 2 or Type N) installations.*
 - The combined Capacitance and Inductance of the inter-connecting cables and the PC Prog. Transmitters **must not** exceed the values indicated on the Associated Apparatus.
 - For FM applications, installation **must** be in accordance to "ANSI/ISA-RP12.06.01" (Installation of I.S. Systems for Hazardous "Classified" Locations) and the National Electric Code "ANSI/NFPA 70". For CSA applications, adhere to the "Canadian Electric Code C22-1" most current publication on I.S. installation guidelines. For ATEX applications, adhere to "EN 60079-14:1997" or any equivalent, most current and pertaining publication on I.S. installation guidelines.
 - Warning!** Substitution of components may impair the Intrinsic Safety of the unit. DO NOT open or service the unit when either energized or if an explosive gas/dust atmosphere is present. Disconnect power servicing. Also read, understand and adhere to the manufacturer's installation and operating procedures.
- The maximum power parameters of the COM port (to be used only in safe/non-hazardous areas) are: Vmax = 3.0 Vdc, Imax = 300uA, Pmax = 240uW. No connections shall be made to the communications "COM" port in Hazardous (Classified) Locations. Programming through the communication port shall only be done in the unclassified location using the Moore Industries USB cable, Part No. 804-030-26.

ANZEX [TRX only]	ATEX LClE	FM	CSA
Terminals +PS -PS	Terminals +PS -PS	Terminals +PS -PS	Terminals +PS -PS
UI = 30V II = 110mA PI = 0.825W CI = 5.2nF LI = 0mH	UI ≤ 30V II ≤ 110mA PI ≤ 0.82W CI ≤ 317nF LI = 0mH	Vmax or UI = 30V Imax or II = 110mA PI = 0.825W CI = 4.7nF LI = 0mH	Vmax or UI = 30Vdc Imax or II = 110mA PI = 0.825W CI = 12nF LI = 0mH
Terminals 1, 2, 3, 4 RTD & T/C	Terminals 1, 2, 3, 4 RTD & T/C [TX2-RTD ONLY]	Terminals 1, 2, 3, 4 RTD & T/C [TX2-RTD ONLY]	Terminals 1, 2, 3, 4 RTD & T/C [TX2-RTD ONLY]
Uo = 6.51V Io = 110mA Po = 532mW Co ≤ 2.262uF Lo ≤ 1.4mH	Uo ≤ 6.5V Io ≤ 110mA Po ≤ 0.82W Co ≤ 2.96uF Lo ≤ 2.9mH	Vt or Voc = 6.51V It or Io = 110mA Po = 0.716W Ca or Co = 2.32uF La or Lo = 3mH	See Note 3

AREA CLASSIFICATION		T Rating
FM US &	Intrinsically Safe: Class I, Division 1, Groups A, B, C & D	
CSA International	Non-Incendive: Class I, Division 2, Groups A, B, C & D	
FM (US NEC 500)	Intrinsically Safe: Class I, Zone 0, AEX ia IIC	T6 @ +60°C
LClE/ATEX	Intrinsically Safe: Ⓢ II 2G EEX ib IIB	
ANZEX	Intrinsically Safe (TRX only): EX ia IIC	T5 @ +85°C

T. Code: T6 @ 60°C Maximum Operating Ambient Temperature Range: -40°C ≤ Tamb. ≤ +60°C

DO NOT SCALE DRAWING	
TOLERANCES (UNLESS NOTED)	DRAWN
DECIMALS = $\frac{\text{digit}}{\text{mm}}$	Gus H. Elias
X = 2.1 12.54	CHECKED
XX = 2.03 0.76	C.B.
XXX = 2.00 0.25	ENGINEER
HOLEES = ± 0.05 N.13	Gus H. Elias
ANGLES = $\pm 30'$	SCALE
	NONE

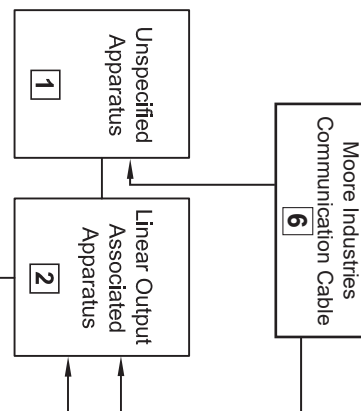
CATEGORY	TITLE
CONTROL DRAWING	Field Installation Diagram: TRY [HPP]
	Isolated PC-Prog. Temp. Xmitters. Intrinsically Safe System For Hazardous "Classified" Locations

DRAWING NUMBER	REVISION
100-100-49	E
REVISED BY	DATE
ECO 18886	07/20
	BY
	T.G. W.T.
	APPROVAL

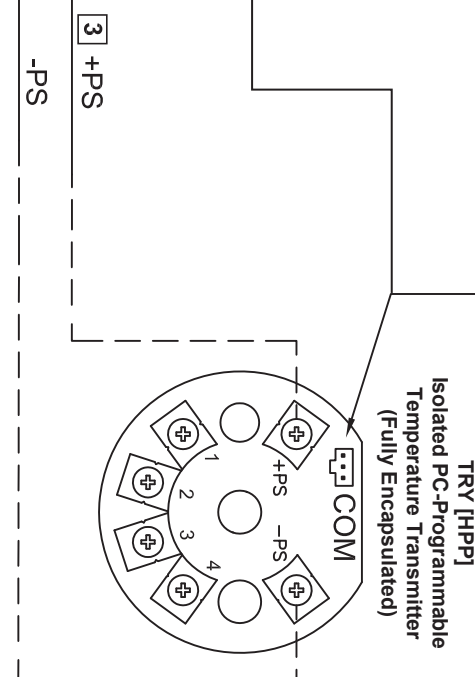
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Un-Classified
(Non-Hazardous/Safe) Area



Warning: The 'COM' Port Must Not Be Used In Hazardous 'Classified' Locations



AREA CLASSIFICATION		T Rating
FM US &	Intrinsically Safe: Class I, Division 1, Groups A, B, C & D	T6 @ +60°C
CSA International	Non-Incendive: Class I, Division 2, Groups A, B, C & D	
FM (US NEC 500)	Intrinsically Safe: Class I, Zone 0, AEX ia IIC	
LClE/ATEX	Intrinsically Safe: Ⓢ II 2G EEx Ib IIC	
ANZEX	Intrinsically Safe: Ex ia IIC	T5 @ +85°C
T. Code: T6 @ 60°C Maximum Operating Temperature Range: -40°C ≤ Tamb. ≤ +60°C		

ANZEX Scheme
Input Parameters (+PS & -PS)
U _i = 30 V
I _i = 110 mA
P _i = 0.825 W
C _i = 5.2 nF
L _i = 0 mH
RTD, T/C, mV, Ω (1, 2, 3, 4)
U _o = 6.51 V
I _o = 205 mA
P _o = 0.675 W
L _o = 0.410 mH
C _o = 5.1 μF

ATEX/FM/CSA Scheme
Entry Parameters (Power/Loop, +PS & -PS)
V _{max} or U _i = 30 VDC
I _{max} or I _i = 110 mA
P _{max} or P _i = 0.825 W
C _i = 10.34 nF
L _i = 0 μH
Ca or Co ≥ C _i + C _{cable}
La or Lo ≥ L _i + L _{cable}
V _{max} or U _i ≥ V _{oc} or V _t
I _{max} or I _i ≥ I _{sc} or I _t
P _i ≥ P _o
RTD, T/C, mV, Ω (1, 2, 3, 4)
Ca or Co = 10 μF
La or Lo = 2.7 mH
V _{oc} or V _t = 6.51 VDC
I _{sc} or I _t = 110 mA
P _o = 0.560 W

Input Device must be 'Agency' approved per application area (CSA, FM, LClE, Test/Safe, etc.)

Installation Notes:

- Associated apparatus which is unspecified except that it **must not** be supplied from, or contain under normal or abnormal conditions a source of potential with respect to earth in excess of 250 Vrms or 250 Vdc which is considered to be the Safe Area's maximum voltage.
- The Linear Output Associated Apparatus **must** be approved by the "specific" (CSA/FM/LClE, etc.) certifying agency for I.S. connections in: "Class I, Division 1, Groups A, B, C & D" or "Zone 0" locations. The output voltage (**V_{oc}**, **V_t** or **U_o**) **must not** exceed **30 Vdc**, the output current (**I_{sc}**, **I_c** or **I_o**) **must not** exceed **110 mA** and, the output power (**P_o**) **must not** exceed **0.825W (P_i)**. Also, it **must** be installed per the manufacturer's guidelines. *A Shunt Zener Barrier is NOT required for Non-Incendive (or Class I, Division 2 or Type N) installations.*
- For the combined Capacitance and Inductance of the inter-connecting cables and the PC Prog. Transmitters **must not** exceed the values indicated on the Associated Apparatus applications. Installation **must** be in accordance to "ANSI/ISA-RP12.06.01" (Installation of I.S. Systems for Hazardous "Classified" Locations) and the National Electric Code "ANSI/NFPA 70". For CSA applications, adhere to the "Canadian Electric Code C22.1" most current publication on I.S. installation guidelines. For ATEX applications, adhere to "EN 60079-14:1997" or any equivalent, most current and pertaining publication on I.S. installation guidelines.
- Warning:** Substitution of components may impair the Intrinsic Safety of the unit. DO NOT open or service the unit when either energized or if an explosive gas/dust atmosphere is present. Disconnect power servicing. Also read, understand and adhere to the manufacturer's installation and operating procedures. The maximum power parameters of the COM port (to be used only in safe/non-hazardous areas) are: V_{max} = 3.0 Vdc, I_{max} = 300uA, P_{max} = 240uW. No connections shall be made to the communications "COM" port in Hazardous (Classified) Locations. Programming through the communication port shall only be done in the unclassified location using the Moore Industries USB cable, Part No. 804-030-26.