

FOSTEN
AUTOMATION



F500TTR

**HEAD MOUNT F500TTR
TEMPERATURE TRANSMITTER**

HART
COMMUNICATION PROTOCOL



www.fosten.com.br

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1. GENERAL DESCRIPTION

The HEAD MOUNT **F500TTR** Temperature Transmitter is designed to be used in industrial environments, offering reliable, accurate and stable measurement. Using microprocessed technology, it accepts configuration via PC computer, allowing the selection of the input sensor, measurement range and calibration in a simplified way.

2. MAIN APPLICATIONS

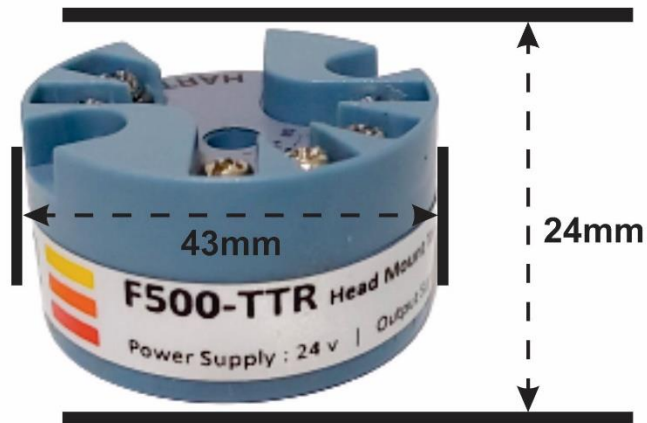
- Sugar and Alcohol
- Fertilizers
- Chemistry
- Food and Beverages
- Petrochemical
- Pharmaceutical
- Energy
- Plastic
- Among others

3. TECHNICAL CHARACTERISTICS

The following are the main technical characteristics of the Head Mount **F500-TTR** Temperature Transmitter.

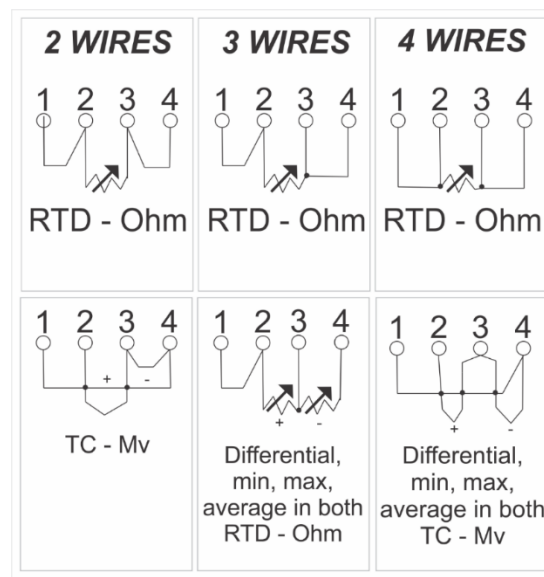
Types	RTD, TC, Ohm, mV
Exit sign	4 to 20 mA
Communication Protocol	Hart
Feeding	9 to 32 Vcc, without polarity – 12 mA
Operation temperature	-40 °C to 85 °C
Stability	0,01°C (RTD), 0,1°C (E J K N T), 0,2°C (B R S)
Precision	0,1°C (RTD), 0,5°C (E J K N T), 1°C (B R S)

4. DIMENSIONAL



5. TYPES OF CONNECTIONS

The following are the different types of connections that can be used for the Head Mount **F500-TTR** Temperature Transmitter.



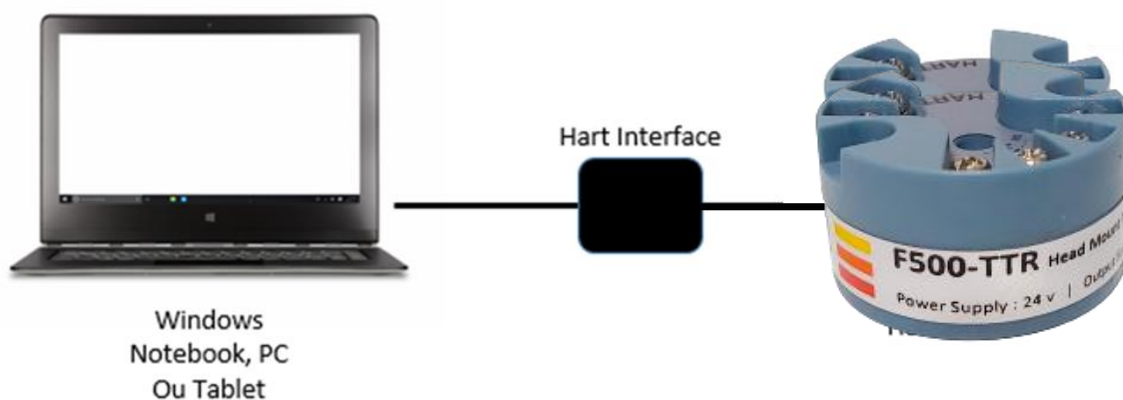
6. SALE CODES

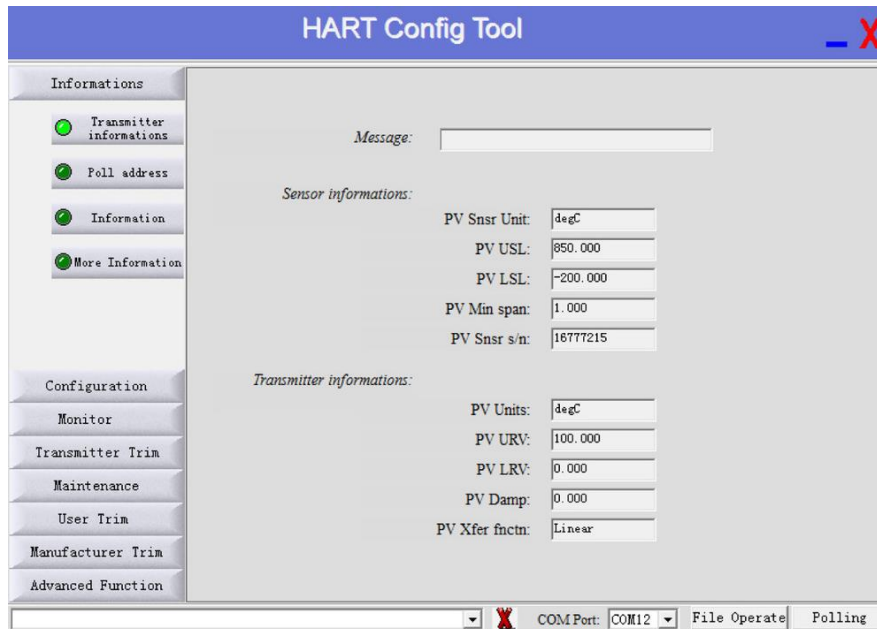
Below we have the sale codes for purchasing:

PRODUCT			
F500TTR	: Head Mount Temperature Transmitter		
COMMUNICATION PROTOCOL			
H	: 4 to 20 mA Hart		
SENSOR TYPE			
1	: RTD - PT100	C	: Thermocouple - Type K
2	: RTD - PT50	D	: Thermocouple - Type N
3	: RTD - PT200	E	: Thermocouple - Type R
4	: RTD - PT500	F	: Thermocouple - Type T
5	: RTD - PT1000	G	: Thermocouple - Type DIN L
6	: RTD - COBRE	H	: Thermocouple - Type U
7	: RTD - NIQUEL (Ni120)	I	: Thermocouple - Type W5RE26
8	: RTD - OHMS (R)	J	: Thermocouple - Type GOST L
9	: Termopar - Tipo E	K	: Thermocouple - mV - 120 to 120
A	: Termopar - Tipo J	L	: Thermocouple - mV - 1000 to 1000
B	: Termopar - Tipo B		
F500TTR	H	1	

7. CONFIGURATION VIA SOFTWARE

The **F500TTR** line transmitters are configured using the Hart Config Tool software, which is free and available on the website. A Hart communication interface of any model/manufacturer is required.





7.1 CONNECTING THE INSTRUMENT

Make sure the instrument and the Hart interface are turned on. Access the Hart Config Tool software and click on the "Polling 0" button in the lower right corner.

IMPORTANT

If necessary, a resistor must be connected in series with the positive pole of the instrument.

By choosing the "Information" button, all the information contained in the instrument will appear

<p>Information</p> <ul style="list-style-type: none"> <input checked="" type="radio"/> Transmitter informations <input checked="" type="radio"/> Poll address <input checked="" type="radio"/> Informations <input checked="" type="radio"/> More Informations 		<p><i>Message:</i> <input type="text" value="??"/></p>	
<p><i>Sensor informations:</i></p>		<p>PV Snsr Unit: <input type="text" value="degC"/></p>	<p>PV USL: <input type="text" value="850.000"/></p>
		<p>PV LSL: <input type="text" value="-200.000"/></p>	<p>PV Min span: <input type="text" value="0.010"/></p>
		<p>PV Snsr s/n: <input type="text" value="16777215"/></p>	
<p><i>Transmitter informations:</i></p>		<p>PV Units: <input type="text" value="degC"/></p>	<p>PV URV: <input type="text" value="850.000"/></p>
		<p>PV LRV: <input type="text" value="-200.000"/></p>	<p>PV Damp: <input type="text" value="1.000"/></p>
		<p>PV Xfer functn: <input type="text" value="Linear"/></p>	
<p>Configuration</p> <p>Monitor</p> <p>Transmitter Cali.</p> <p>Transmitter Test</p> <p>User Cali.</p> <p>Advanced Function</p>	<p><input type="text"/> <input type="button" value="X"/> COM: <input type="text" value="COM1"/> <input type="button" value="File"/> <input type="button" value="Polling"/> <input type="button" value="Polling 0"/></p>		

7.2. WORK RANGE

To adjust the working range, just choose the "Configuration" button. In the sub-option "Range", the minimum and maximum ranges will be displayed ("Sensor Information" box) and then the working range in which the instrument is configured ("Output Range" box).

To change this range and adjust it, just select the LRV (low temperature or minimum value) and URV (high temperature or maximum value) boxes. Making change, click the "Write" button to confirm and save.

The screenshot displays a software interface for configuring an instrument. On the left is a vertical menu with the following options: "Informations", "Configuration", "Range" (selected with a green circle), "Output function", "Fault protection", "Monitor", "Transmitter Cali.", "Transmitter Test", "User Cali.", and "Advanced Function". The main area is titled "Sensor Information:" and contains the following fields: "PV Snsr s/n:" with the value "16777215", "PV USL:" with "850.000", "PV LSL:" with "-200.000", "PV Snsr unit:" with "degC", and "PV Min span:" with "0.010". Below this is a "Range values:" section with "PV Unit:" set to "degC", "PV URV:" with "850.000", and "PV LRV:" with "-200.000". At the bottom of the main area are "Read" and "Write" buttons. The bottom status bar shows a dropdown menu, a red 'X' icon, "COM: COM1", "File", "Polling", and "Polling 0".

7.3. DAMP AND DISPLAY INDICATION OPTIONS

To adjust options such as Damping, choose the "Configuration" button and then the sub-option "Output". On the next screen that opens, choose the options for Damp and linear function in the "Output Characteristics" box. In the table below, select the desired one for Display 1 and Display 2.

The screenshot shows a software configuration window with a sidebar on the left and a main configuration area on the right. The sidebar contains the following menu items: Informations, Configuration, Range, Output function, Fault protection, Monitor, Transmitter Cali., Transmitter Test, User Cali., and Advanced Function. The 'Configuration' menu is selected, and the 'Output' sub-option is active. The main area is titled 'Output:' and contains two sections: 'Output Characteristics' and 'Display 1' and 'Display 2'. The 'Output Characteristics' section has a text input for 'PV Damp' set to '1.000' with '(s)' next to it, and a dropdown for 'PV Xfer fnctn' set to 'Linear'. The 'Display 1' section has a dropdown for 'Meter type' set to 'P. V.' and a dropdown for 'Sel dec pt pos' set to '1'. The 'Display 2' section has a dropdown for 'Meter type' set to 'P. V.' and a dropdown for 'Sel dec pt pos' set to '1'. At the bottom of the main area are 'Read' and 'Write' buttons. The status bar at the bottom shows a red 'X' icon, 'COM: COM1', 'File', 'Polling', and 'Polling 0'.

7.4. WRITING AND ALARM PROTECTION

To enable the writing protection, preventing allowed changes to the configuration already made and saved in the memory of the instrument, simply choose the "Configuration" button and the sub-option: "Fault Protection".

On this same screen, there is also the possibility of setting the alarm, in which you can select an option for very low or very high current to send an alarm signal.

The screenshot displays the configuration interface for the instrument, specifically the 'Fault protection' settings. The interface is divided into a left sidebar and a main configuration area.

Left Sidebar:

- Informations
- Configuration
 - Range
 - Output function
 - Fault protection
- Monitor
- Transmitter Cali.
- Transmitter Test
- User Cali.
- Advanced Function

Main Configuration Area:

write-protect:

State: OFF (selected), OFF, ON

Alarm Current:

State: Output Low Alarm (selected)

High Alarm: 22.00 mA (21~23)

Low Alarm: 3.75 mA (3.5~3.75)

Note: 1, High Alarm must be at least 0.1 mA upper than High Sat.
2, Low Alarm must be at least 0.1 mA lower than Low Sat.

Saturation Current:

High Sat.: 21.00 mA (20.5~22.9)

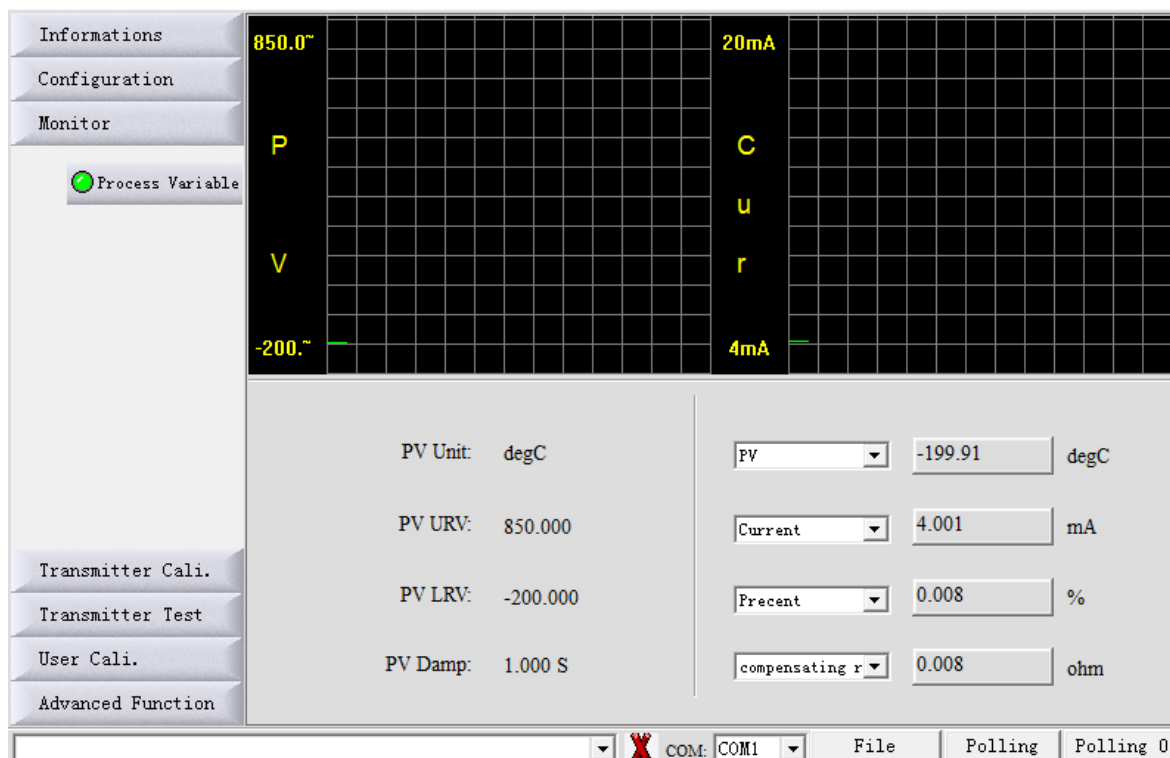
Low Sat.: 3.90 mA (3.6~3.9)

Buttons: Read, Write

Bottom Bar: X COM: COM1 File Polling Polling 0

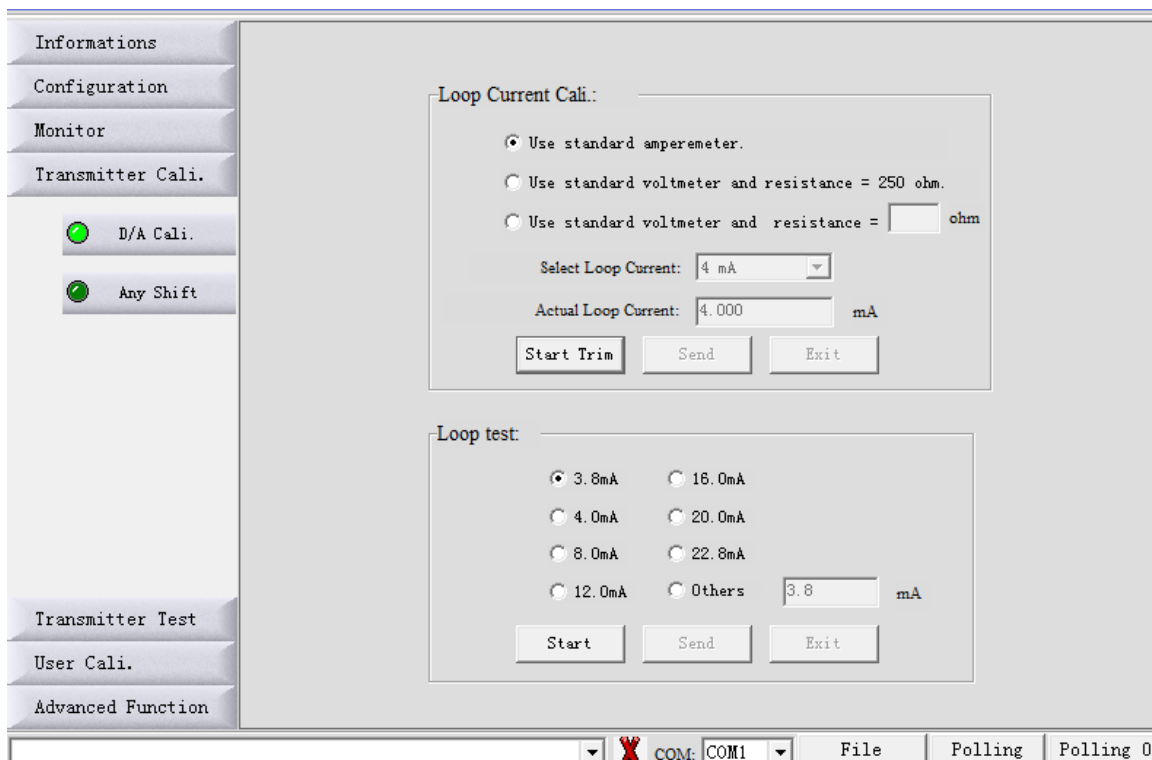
7.5. MONITORING VARIABLES

Choose the "Monitor" button and the "Process Variable" sub-option. A screen will be available in which the variables can be selected to be monitored and displayed in a graph.



7.6. CURRENT TRIM AND LOOP

Choose the "Transmitter Cali" button and the "D/A Cali" sub-option to perform the current trim (4 to 20 mA), using a multimeter as a reference. To perform a simulation and test with various current values, see the options in the "Current Loop Test" table.



7.7. CALIBRATION UNTIL 5 POINTS

To carry out the calibration of the temperature transmitter, it will be necessary to have as a reference a resistance generator in Ohms to change the resistance, or a generator to change the current or millivolts.

Choose the "User Cali" button, and in the frame that opens, choose in the "Trim Point:" box: the number of points at which you want to calibrate it.

The screenshot shows the 'User calibration' window. On the left sidebar, the 'User Cali.' button is selected. The main window has a 'Trimmed information:' field. It is divided into four columns: 'Shortcut to input', 'Collection Value', 'Input Value', and 'Trim Point'. The 'Shortcut to input' column contains 'PV Unit' (degC), 'PV URV' (850.000), 'PV LRV' (-200.000), and an 'Equal division' button. The 'Collection Value' and 'Input Value' columns each have a 'Unit' dropdown set to 'degC' and four empty input fields. The 'Trim Point' column has a dropdown menu with options 2, 3, 4, and 5 (option 2 is selected), and four 'Collect' buttons. At the bottom of the main area are 'Cancel user trim', 'Read', and 'Write' buttons. The bottom status bar shows 'COM: COM1', 'File', 'Polling', and 'Polling 0'.

After selecting the number of points at which you want to calibrate your transmitter, click on the "Equal division" button, which will distribute the points to be trimmed and adjusted. It will automatically distribute and equalize the points according to the requested number.

Informations
 Configuration
 Monitor
 Transmitter Cali.
 Transmitter Test
 User Cali.
 User Cali.
 User Cali.
 Clique aqui após selecionar a quantidade de pontos
 Advanced Function

User calibration

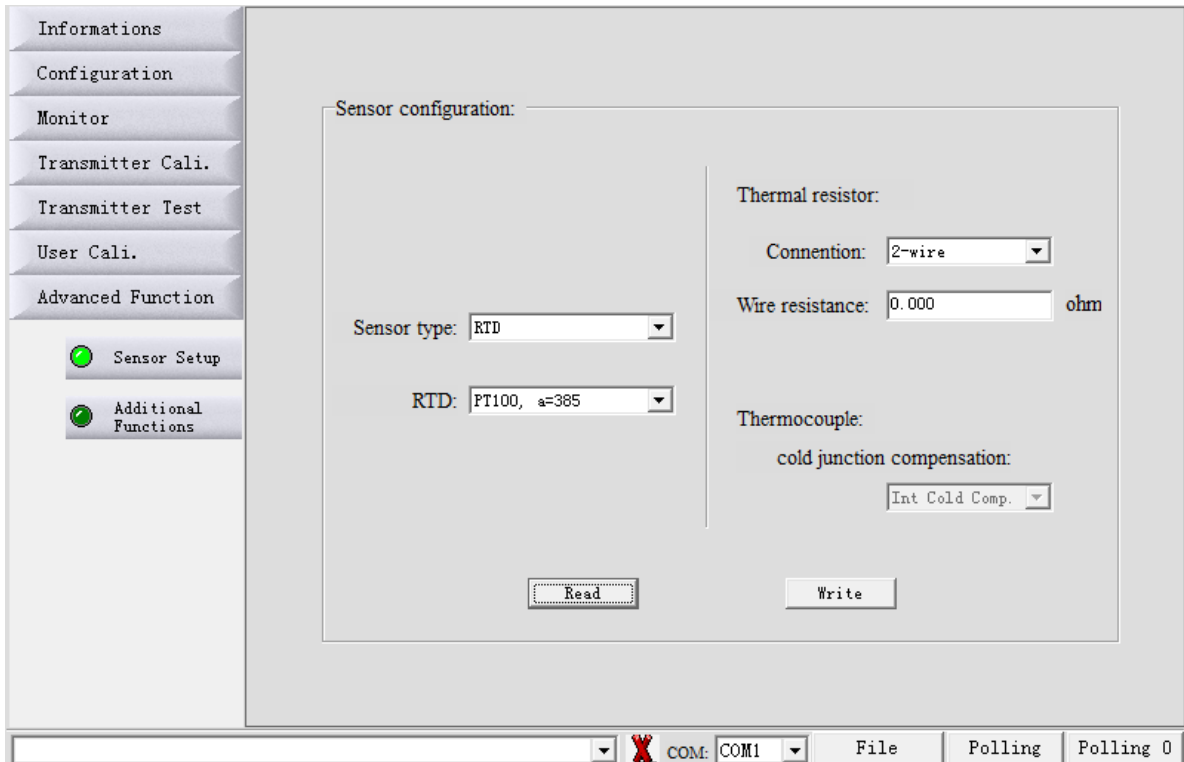
Trimed information:

Shortcut to input:	Collection Value:	Input Value:	Trim Point:
PV Unit: <input type="text" value="degC"/>	Unit: <input type="text" value="degC"/> <input type="text"/>	Unit: <input type="text" value="degC"/> <input type="text" value="-200.000"/>	<input type="text" value="5"/> <input type="button" value="Collect"/>
PV URV: <input type="text" value="850.000"/>	<input type="text"/>	<input type="text" value="62.000"/>	<input type="button" value="Collect"/>
PV LRV: <input type="text" value="-200.000"/>	<input type="text"/>	<input type="text" value="325.000"/>	<input type="button" value="Collect"/>
<input type="button" value="Equal division"/>	<input type="text"/>	<input type="text" value="587.000"/>	<input type="button" value="Collect"/>
	<input type="text"/>	<input type="text" value="850.000"/>	<input type="button" value="Collect"/>

Using the resistance generator in Ohms as a reference, or another calibrator that makes the change within the range that you want to perform the point-to-point calibration, always click on the "Collect" button for each point performed. After making all the points, choose the "Write" button to record the calibration performed and the points generated.

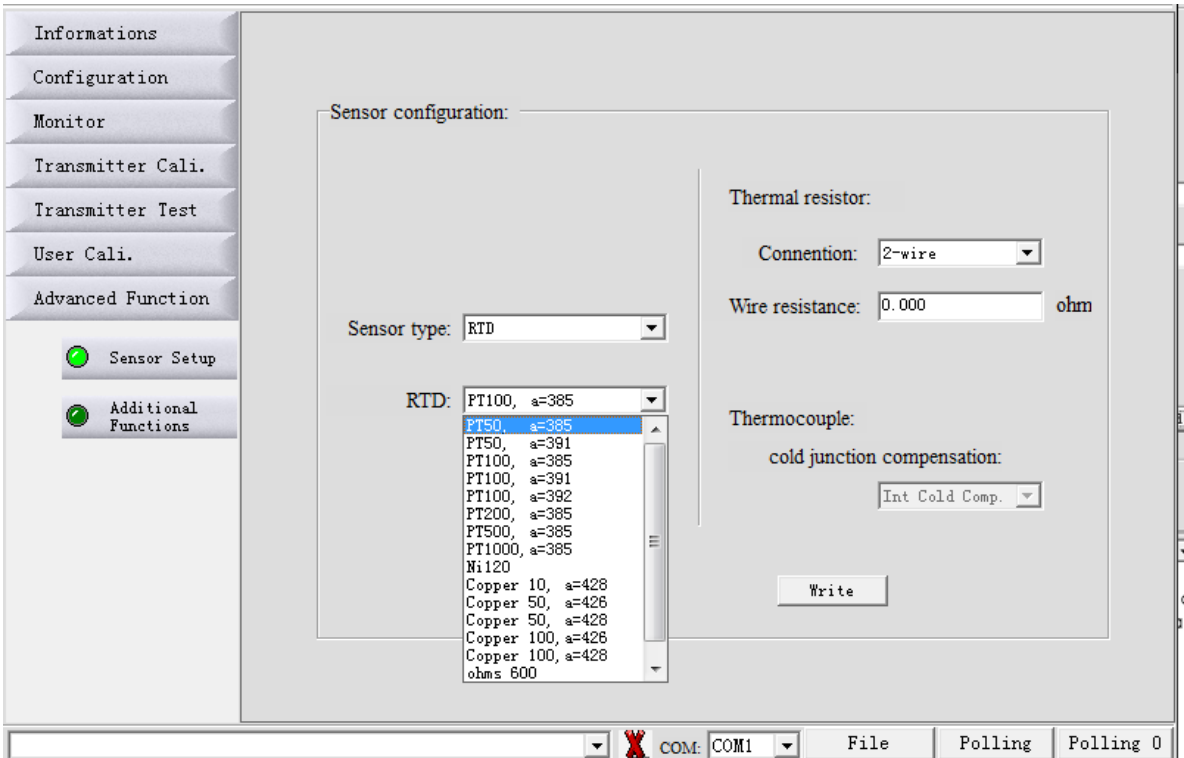
7.8 CHANGING THE TYPE OF SENSOR AND THE QUANTITY OF WIRE

To change the type of sensor you are going to use, be it thermocouple (TC) or PT100 (RTD), choose the “Advanced Function” button and the sub-option “Sensor Setup”, it will make the Sensor Type options (RTD and TC) available.

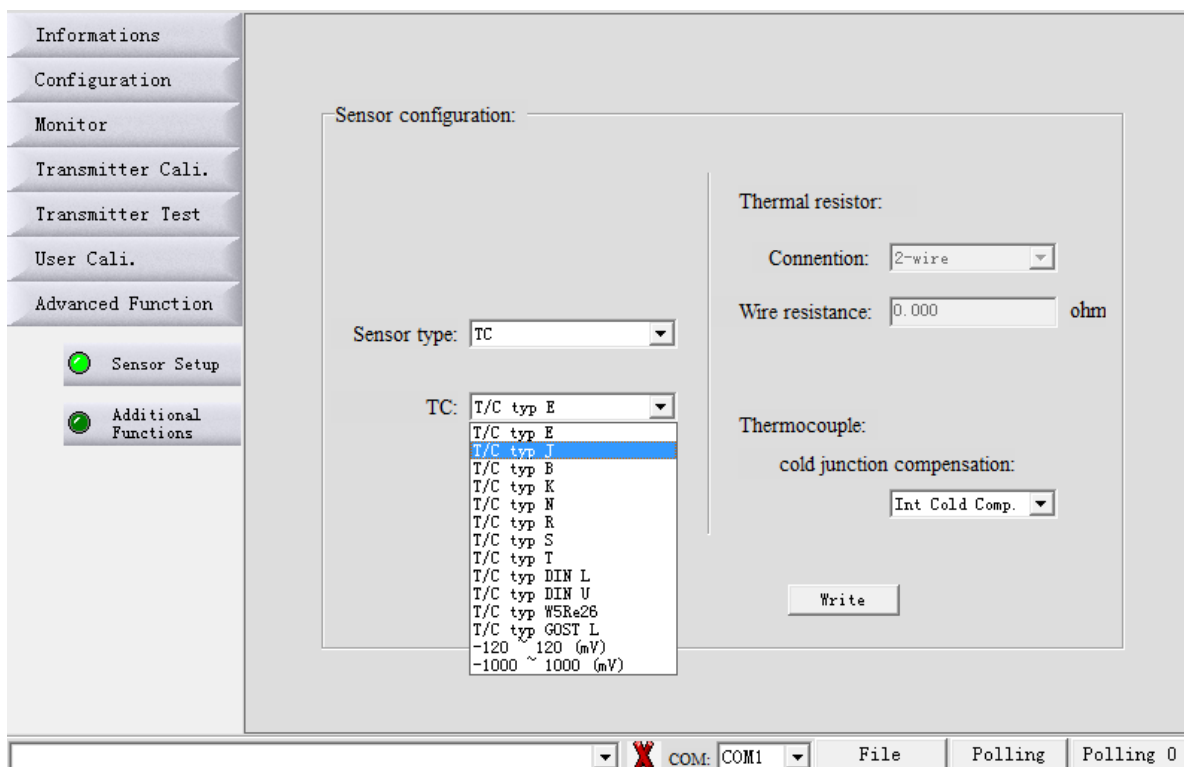


On this same screen you can also choose the number of wires for your PT100 or thermocouple, being able to change the options contained in the “Connention” box in the “Thermal Resistor” box.

Selecting the RTD option (PT100) in the box, it will provide the available options below.



Selecting the TC (Thermocouple) option, it will provide the available options in the box below. Remembering that in the TC option, it also releases the Junction compensation option.



Whenever selected and made the change as desired, then choose the "Write" button to save.

8. WARRANTY

The Head Mount **F500-TTR** Temperature Transmitter has a 12 month warranty. Such warranty becomes invalid once the following situations are detected:

- Incorrect installation of the instrument
- Use in inappropriate applications
- Mechanical damage by impacts

Electrical damage as a result of damage from other instruments in the industrial plant.

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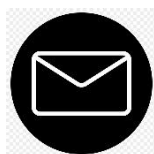
A U T O M A T I O N

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