Signal Isolators / Converters / Splitters

SIG-221D
SIG-351D / SIG-352D
SIG-351T / SIG-352T

Process Precision Instruments
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Maharashtra, India

www.ppiindia.net

User Manual

SIG-221D

SIG-351D
SIG352D

SIG-351T
SIG352T

Configuration Tool

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Section 1

ELECTRICAL CONNECTIONS

WARNING
MISHANDLING / NEGLIGENCE CAN RESULT IN PERSONAL DEATH OR SERIOUS INJURY.

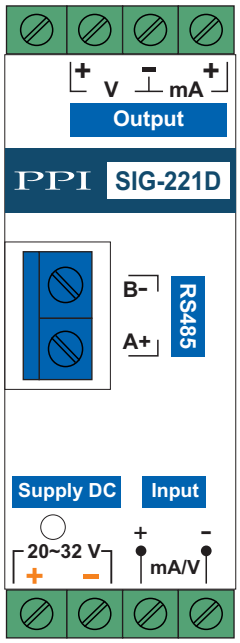
1. The user must rigidly observe the Local Electrical Regulations.
2. Do not make any connections to the unused terminals for making a tie-point for other wires (or for any other reasons) as they may have some internal connections. Failing to observe this may result in permanent damage to the indicator.
3. Run power supply cables separated from the low-level signal cables (like RTD, Thermocouples, DC Linear Current / Voltage etc.). If the cables are run through conduits, use separate conduits for power supply cable and low-level signal cables.
4. Use appropriate fuses and switches, wherever necessary, for driving the high voltage loads to protect the module from any possible damage due to high voltage surges of extended duration or short-circuits on loads.
5. Take care not to over-tighten the terminal screws while making connections.
6. Make sure that the module supply is switched-off while making/removing any connections.

CONNECTION DIAGRAM

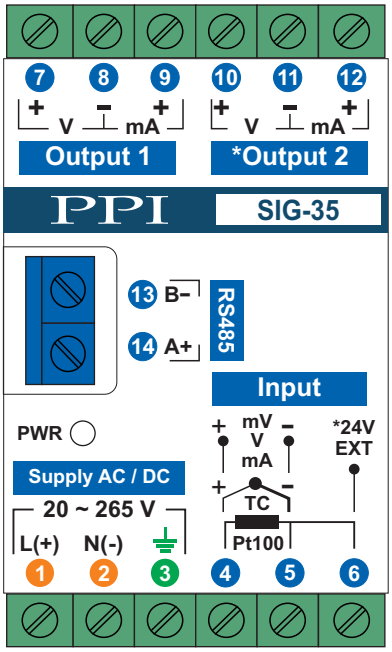
The Figure 1.1 illustrates Electrical Connection Diagrams.

Figure 1.1

SIG-221D



SIG-351D / 352D
SIG-351T / 352T



INPUT CONNECTIONS

DC Linear Current / Voltage (mA / mV / V)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA / mV / V source. Connect common to terminal (-) and the signal to terminal (+), as shown in **Figures 1.2(a), 1.2(b), 1.2(c) & 1.2(d).**

Models : 351D & 352D

Figure 1.2(a)

DC linear (mA / V)

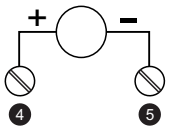
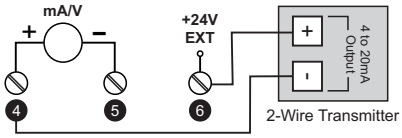


Figure 1.2(b)

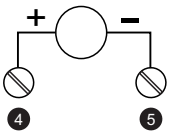
Internal 24VDC Excitation



Models : 351T & 352T

Figure 1.2(c)

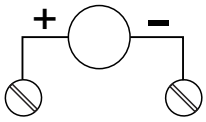
DC linear (0-80 mV)



Model : 221D

Figure 1.2(d)

DC Linear (mA / V)



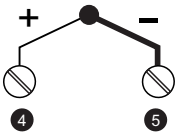
Thermocouple

Connect Thermocouple Positive (+) to terminal 4 and Negative (-) to terminal 5 as shown in **Figure 1.3**. Use the correct type of Thermocouple extension lead wires or compensating cable for the entire distance ensuring the correct polarity throughout. Avoid joints in the cable.

Models : 351T & 352T

Figure 1.3

Thermocouple



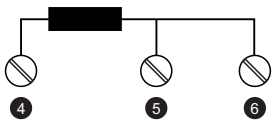
RTD Pt100, 3-wire

Connect single leaded end of **RTD** bulb to terminal 4 and the double leaded ends to terminals 5 and 6 (interchangeable) as shown in **Figure 1.4.** Use copper conductor leads of very low resistance ensuring that all 3 leads are of the same gauge and length. Avoid joints in the cable.

Models : 351T & 352T

Figure 1.4

RTD Pt100 (2 / 3-Wire)



OUTPUT CONNECTIONS

Models : 351D & 352D
351T & 352T

Figure 1.5(a)

Voltage (V) Output

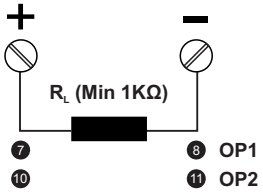
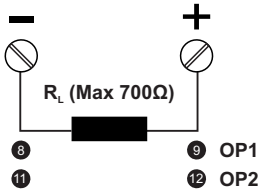


Figure 1.5(b)

Current (mA) Output



Model : 221D

Figure 1.5(c)

Voltage (V) Output

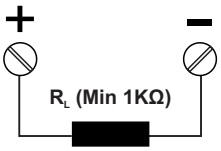
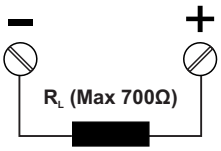


Figure 1.5(d)

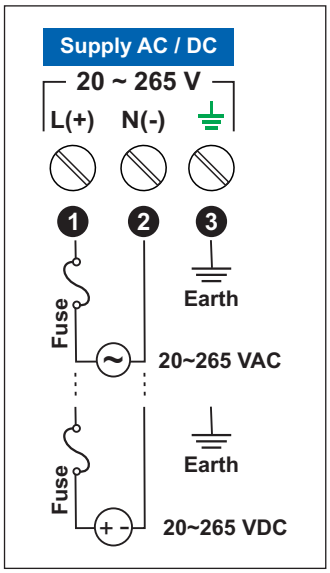
Current (mA) Output



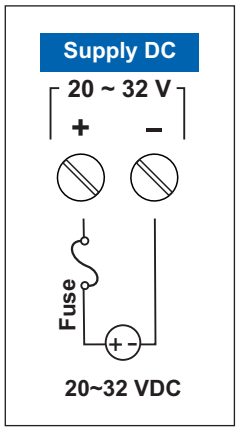
POWER SUPPLY

Figure 1.6

Models : 351D & 352D
351T & 352T



Model : 221D



Note :
The model SIG-221D operates on 20 to 32 VDC.

The models SIG-351D / 352D / 351T / 352T operates on both AC & DC Voltage; 20 to 265 V AC/DC.

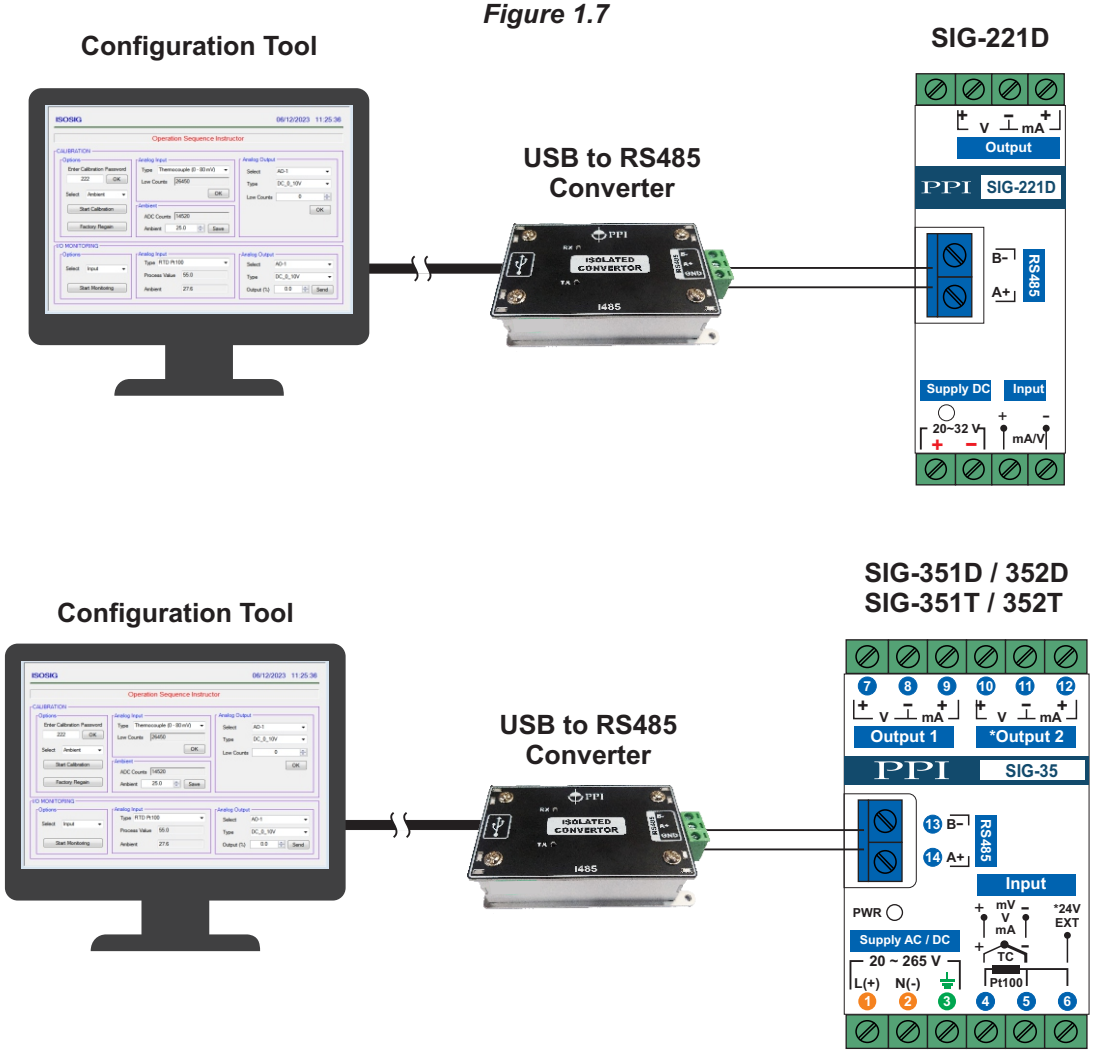
The accuracy / performance of the Module is not affected by the variations in the supply within specified limits. Use well-insulated copper conductor wire of the size not smaller than 0.5mm² for power supply connections ensuring proper polarity as shown in Figure 1.6. The Module is not provided with fuse and power switch. If necessary, mount them separately. Use a slow blow fuse rated for 0.5A current.

For safety and enhanced electrical noise immunity, it is highly recommended to connect Main Power Supply 'Earth' to the terminal provided for earthing connection.

SERIAL COMMUNICATION PORT

The wiring connections for connecting the module to the PC for Configuration / Calibration is shown in the figure 1.7.

Figure 1.7



Section 2

PARAMETERS

The Modules can be configured for a variety of Input and Output types depending on the models. A PC based Configuration & Calibration Software Tool is available for download (free of cost) from the website.

The table 2.1 below describes the various settable parameters with their respective ranges / options.

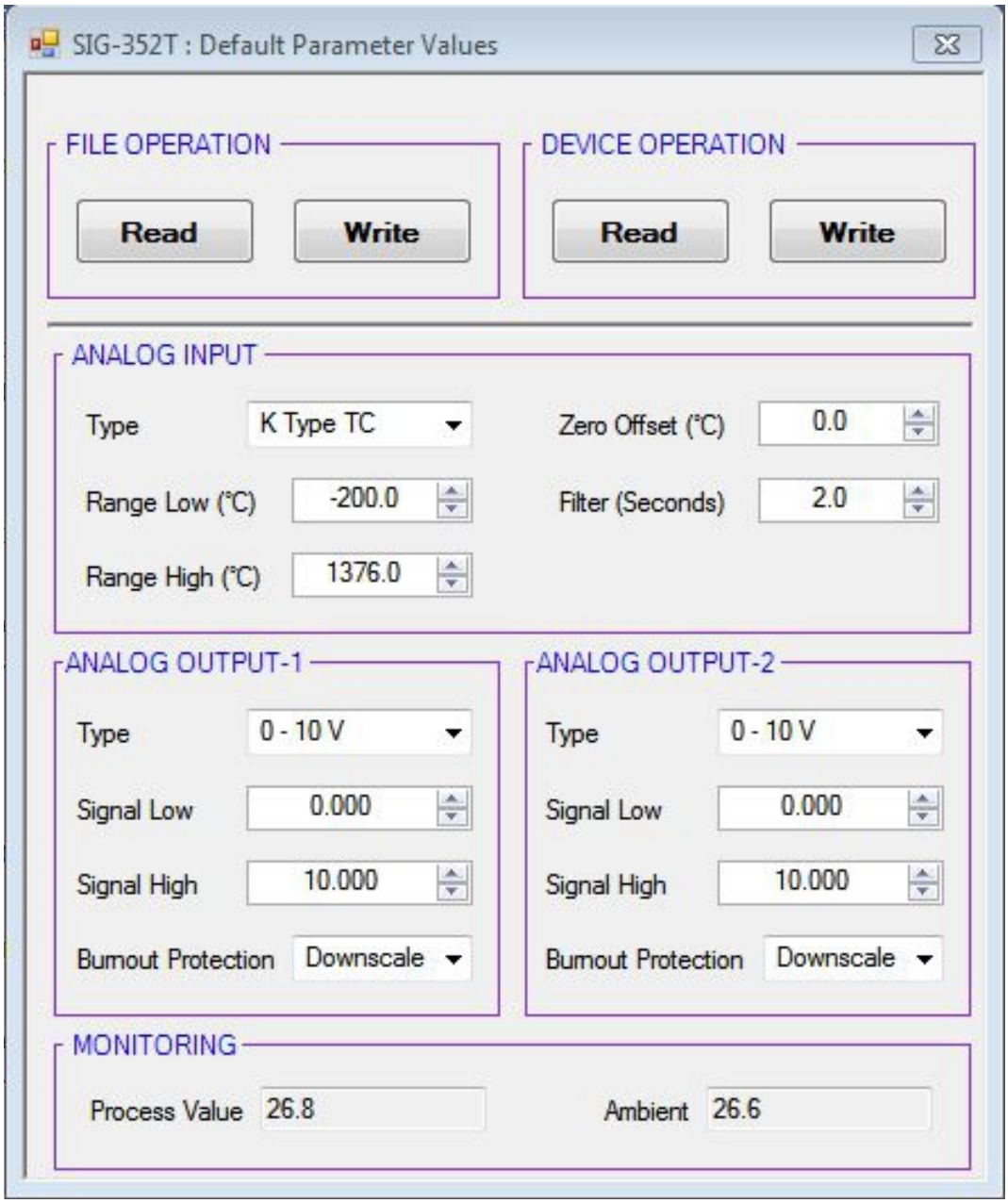


Table 2.1 : **Input Registers (Read-Only Parameters)**

<table>
<tr><th colspan="3">ANALOG INPUT</th></tr>
<tr><th>Parameter Description</th><th>Applicable Models</th><th>Settings</th></tr>
<tr><td>Type

Select Input type in accordance with the type of Thermocouple or RTD sensor or transducer output connected to the module.</td><td>221D
351D
352D
351T
352T</td><td>Models : 221D, 351D & 352D
<table><tr><th>Option</th><th>Description</th></tr><tr><td>0 - 20 mA</td><td>0 to 20 mA</td></tr><tr><td>4 - 20 mA</td><td>4 to 20 mA</td></tr><tr><td>0 - 1.25 V</td><td>0 to 1.25 V</td></tr><tr><td>0 - 5 V</td><td>0 to 5 V</td></tr><tr><td>0 - 10 V</td><td>0 to 10 V</td></tr><tr><td>1 - 5 V</td><td>1 to 5 V</td></tr></table>
Models : 351T & 352T
<table><tr><th>Option</th><th>Description</th></tr><tr><td>J Type TC</td><td>Type J Thermocouple</td></tr><tr><td>K Type TC</td><td>Type K Thermocouple</td></tr><tr><td>T Type TC</td><td>Type T Thermocouple</td></tr><tr><td>R Type TC</td><td>Type R Thermocouple</td></tr><tr><td>S Type TC</td><td>Type S Thermocouple</td></tr><tr><td>B Type TC</td><td>Type B Thermocouple</td></tr><tr><td>N Type TC</td><td>Type N Thermocouple</td></tr><tr><td>E Type TC</td><td>Type E Thermocouple</td></tr><tr><td>RTD Pt100</td><td>RTD Pt100, 3-wire</td></tr><tr><td>0 - 80 mV</td><td>0 to 80 mV</td></tr></table></td></tr>
</table>

<table>
<tr><th>Parameter Description</th><th>Applicable Models</th><th>Settings</th></tr>
<tr><td>Range Low

The Process Value / DC Input Signal corresponding to the Output Signal Low value.</td><td rowspan="2">221D
351D
352D
351T
352T</td><td rowspan="2">Models : 221D, 351D & 352D
<table><tr><th>Selected Input Type</th><th>Range Low to Range High Span</th></tr><tr><td>0 - 20 mA</td><td>0.000 to 20.000 mA</td></tr><tr><td>4 - 20 mA</td><td>4.000 to 20.000 mA</td></tr><tr><td>0 - 1.25 V</td><td>0.000 to 1.250 V</td></tr><tr><td>0 - 5 V</td><td>0.000 to 5.000 V</td></tr><tr><td>0 - 10 V</td><td>0.000 to 10.000 V</td></tr><tr><td>1 - 5 V</td><td>1.000 to 5.000 V</td></tr></table>
Models : 351T & 352T
<table><tr><th>Selected Input Type</th><th>Range Low to Range High Span</th></tr><tr><td>J Type TC</td><td>0 to +960°C</td></tr><tr><td>K Type TC</td><td>-200 to +1376°C</td></tr><tr><td>T Type TC</td><td>-200 to +387°C</td></tr><tr><td>R Type TC</td><td>0 to +1771°C</td></tr><tr><td>S Type TC</td><td>0 to +1768°C</td></tr><tr><td>B Type TC</td><td>0 to +1826°C</td></tr><tr><td>N Type TC</td><td>0 to +1314°C</td></tr><tr><td>E Type TC</td><td>-200 to +1000°C</td></tr><tr><td>RTD Pt100</td><td>-199 to +850°C</td></tr><tr><td>0 - 80 mV</td><td>0.00 to +80.00 mV</td></tr></table></td></tr>
<tr><td>Range High

The Process Value / DC Input Signal corresponding to the Output Signal High value.</td></tr>
<tr><td>Zero Offset (°C)

This value is algebraically added to the measured PV to derive the final PV.

Final PV = Measured PV + Offset</td><td>351T
352T</td><td>Note : Not available if selected type is 0 to 80 mV.

-199.9 to 999.9 °C</td></tr>
<tr><td>Filter (Seconds)

Sets the time constant, in seconds, for the low-pass digital filter applied to the measured PV. The filter helps smoothing / averaging the signal input and removing the undesired noise. The higher the filter value the slower the PV response.</td><td>221D
351D
352D
351T
352T</td><td>0.5 to 60.0 Seconds
(in steps of 0.5 Seconds)</td></tr>
</table>

ANALOG OUTPUT-1 (Models : 221D, 351D, 352D, 351T & 352T)
ANALOG OUTPUT-2 (Models : 352D & 352T)

<table>
<tr><th>Parameter Description</th><th>Settings</th></tr>
<tr><td>Type

Select the desired output signal type.</td><td>
<table>
<tr><th>Option</th><th>Description</th></tr>
<tr><td>0 - 10 V</td><td>0 to 10 V</td></tr>
<tr><td>1 - 5 V</td><td>1 to 5 V</td></tr>
<tr><td>0 - 5 V</td><td>0 to 5 V</td></tr>
<tr><td>0 - 20 mA</td><td>0 to 20 mA</td></tr>
<tr><td>4 - 20 mA</td><td>4 to 20 mA</td></tr>
<tr><td>0 - 10 mA</td><td>0 to 10 mA</td></tr>
</table>
</td></tr>
<tr><td>Signal Low

The Output Signal Value corresponding to the set Range Low Process Value / DC Input Signal.</td><td rowspan="2">
<table>
<tr><th>Selected Output Type</th><th>Signal Low to Signal High Span</th></tr>
<tr><td>0 - 10 V</td><td>0.000 to 10.000 V</td></tr>
<tr><td>1 - 5 V</td><td>1.000 to 5.000 V</td></tr>
<tr><td>0 - 5 V</td><td>0.000 to 5.000 V</td></tr>
<tr><td>0 - 20 mA</td><td>0.000 to 20.000 mA</td></tr>
<tr><td>4 - 20 mA</td><td>4.000 to 20.000 mA</td></tr>
<tr><td>0 - 10 mA</td><td>0.000 to 10.000 mA</td></tr>
</table>
</td></tr>
<tr><td>Signal High

The Output Signal Value corresponding to the set Range High Process Value / DC Input Signal.</td></tr>
<tr><td>Burnout Protection

This parameter determines the “Output Signal Value” in case of Process Value error or the Input signal exceeding the min / max range.

If set to “Upscale” the output signal corresponds to the set “Signal High” Value.

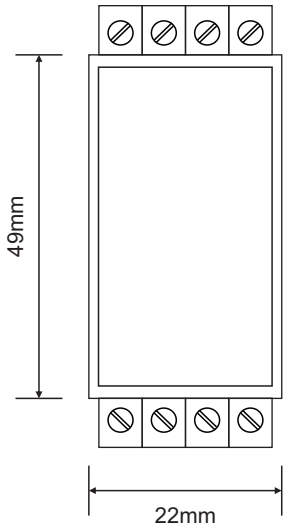
If set to “Downscale” the output signal corresponds to the set “Signal Low” Value.</td><td>Upscale
Downscale</td></tr>
</table>

Section 3

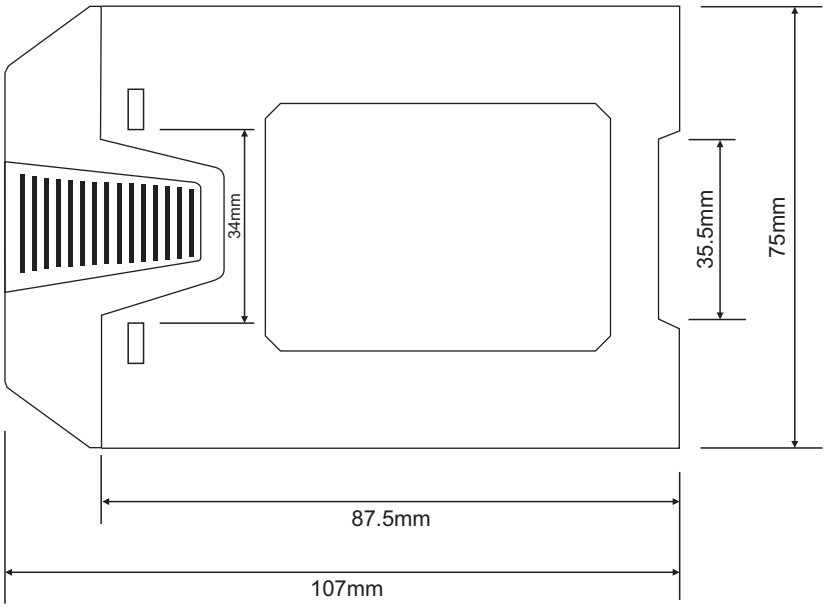
MECHANICAL DIMENSIONS

SIG-221D

Front View



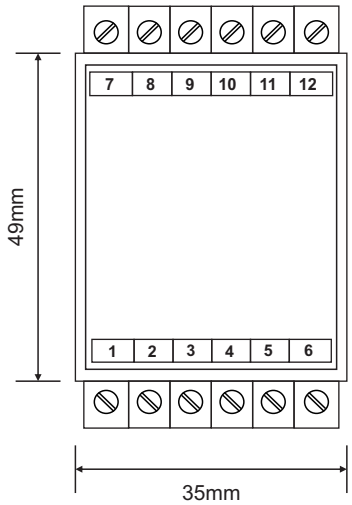
Side View



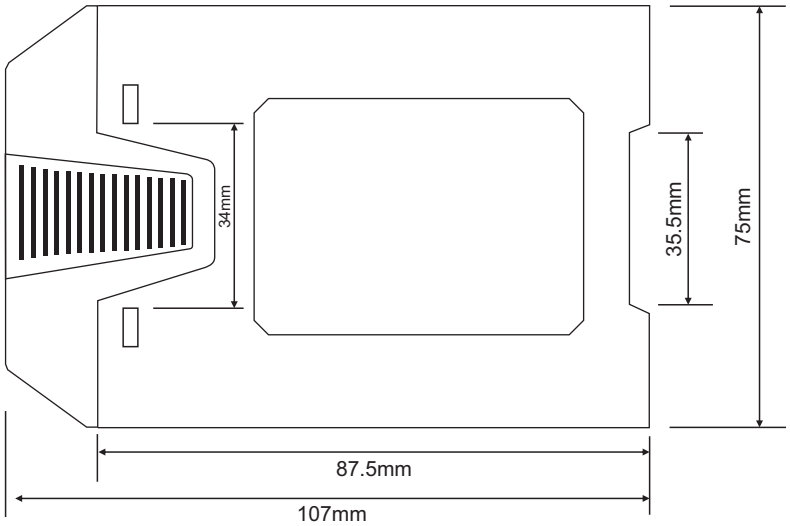
Overall Dimensions : 22(W) X 75(H) X 107(D), mm

SIG-351D / 352D
SIG-351T / 352T

Front View



Side View



Overall Dimensions : 35(W) X 75(H) X 107(D), mm

Section 4

PC BASED DEVICE SETUP UTILITY

OVERVIEW

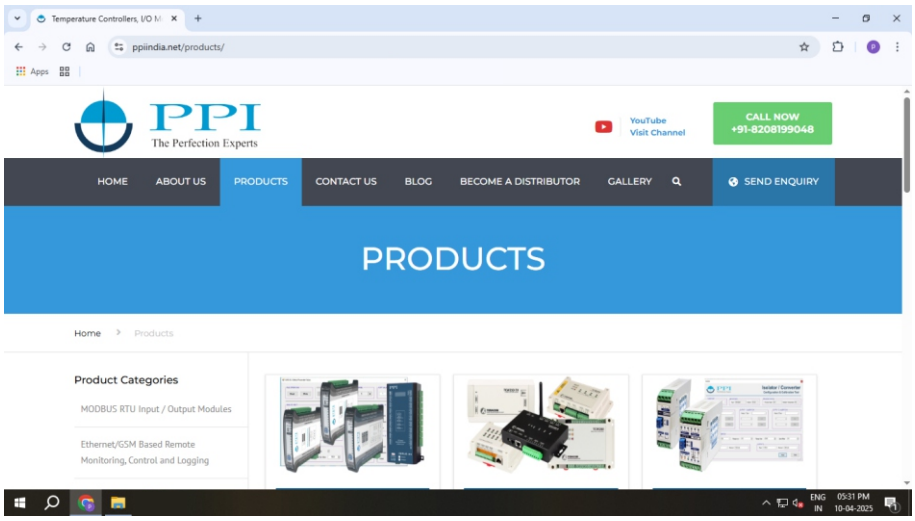
UniSet is a free Windows-based configuration utility developed by PPI to simplify the setup, parameter configuration, and monitoring of its MODBUS-compatible product range. It eliminates the need for manual MODBUS commands and streamlines device commissioning and testing.

This utility offers a quick, reliable, and user-friendly interface for configuring and validating this device during initial setup and field deployment.

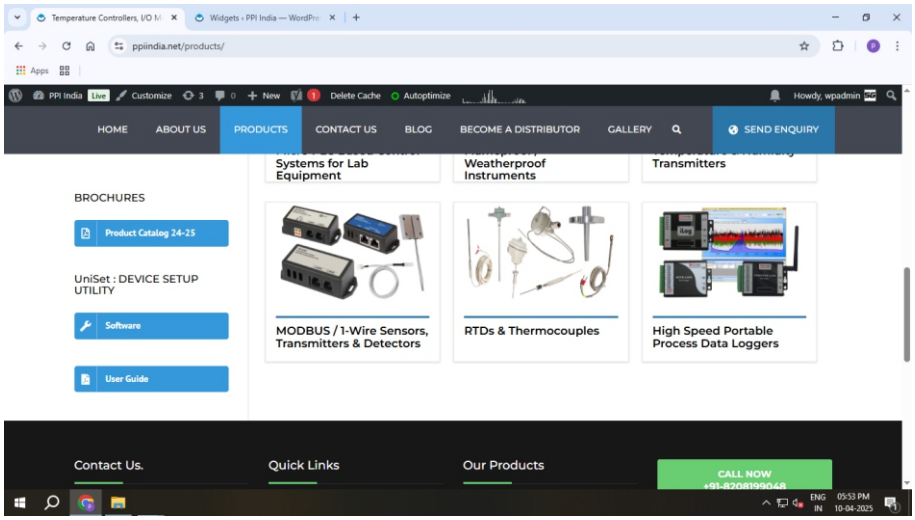
4.1 DOWNLOADING THE SETUP TOOL

The tool is available for **free download** from the **PPI website** and can be accessed from the **PRODUCTS** section. To download and launch the tool:

1. **Visit** www.ppiindia.net and click on the **PRODUCTS** tab in the main navigation menu.



2. In the **left-hand panel**, scroll to **UniSet : Device Setup Utility**.



3. Two buttons will be visible under this section:
   - **Software** – Click to download the configuration utility archive (IO-Module-Configuration-Tool.rar).
   - **User Guide** – Click to download the PDF manual for reference.

4. After downloading the archive file:
   - Extract the contents into a folder (e.g., IO-Module-Configuration-Tool).
   - Open the folder and double-click on IO Module Configuration Tool.exe to launch the application.

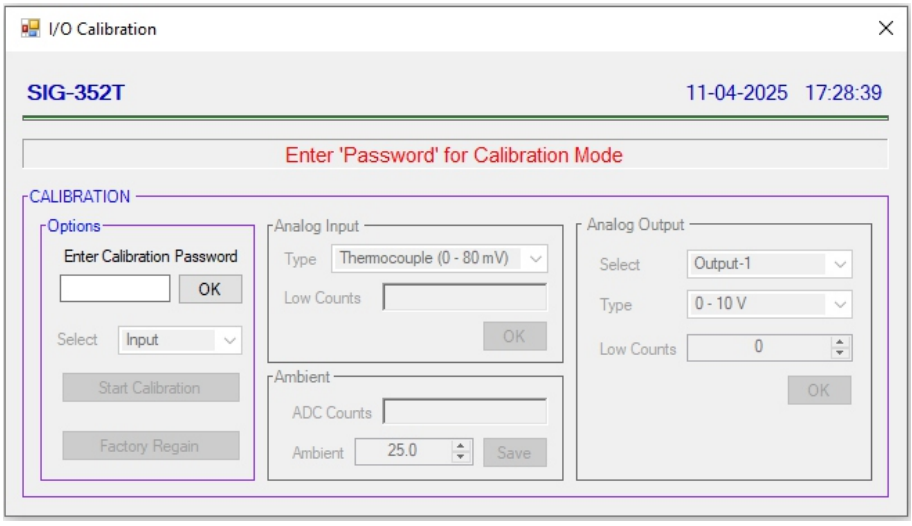
The **UniSet** interface for this device includes the following key task panels:

4.2 PARAMETER SETTINGS

Used to configure device-specific channel parameters. Users can load/save configuration files or write/read directly to/from the connected device.

4.3 ON-LINE I/O CALIBRATION

Allows users to calibrate analog inputs, analog outputs, and ambient temperature sensing - depending on the model variant.



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