ScanLog 96

PC Interface Version

PPI
The Perfection Experts

Single / Dual Channels
Universal Process Data Logger
with PC Software

User Manual

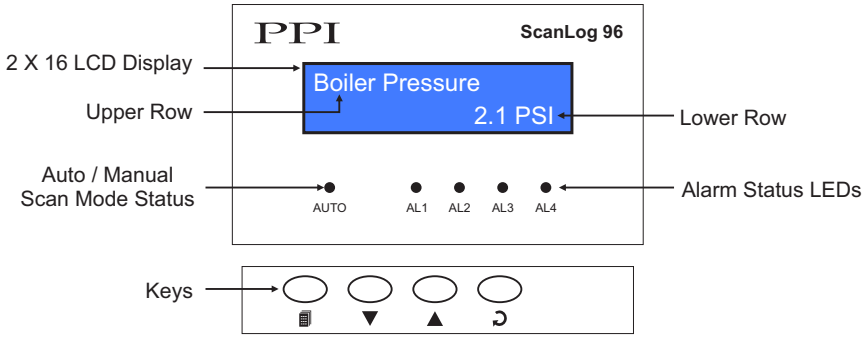
CONTENTS

1.	FRONT PANEL : LAYOUT AND OPERATION	1
2.	BASIC OPERATION	3
3.	OPERATOR PARAMETERS	6
4.	ALARMS PARAMETERS	7
5.	SUPERVISORY PARAMETERS	9
6.	DEVICE CONFIGURATION	10
7.	CHANNEL CONFIGURATION	11
8.	ALARMS CONFIGURATION	16
9.	RECORDER CONFIGURATION	17
10.	RTC SETTINGS	18
11.	UTILITIES	19
12.	MECHANICAL INSTALLATION	20
13.	ELECTRICAL CONNECTIONS	22
APPENDIX-A : DC LINEAR SIGNAL INTERFACE		26
APPENDIX-B : LOW / HIGH CLIPPING		28

Section 1
FRONT PANEL : LAYOUT AND OPERATION

The front panel comprises of 2 X 16 (2 rows of 16 characters each) LCD Display, LED indicators & membrane keys. Refer Figure 1.1 below.

Figure 1.1



LCD DISPLAY

The LCD Display has 2 rows, the Upper Row & the Lower Row; each having 16 Characters.

In normal mode of operation (Run Mode), the Upper Row displays the Channel Names and the Lower Row displays the corresponding Process Values followed by Units. Refer Figure 1.2 (a) below.

Figure 1.2(a)

Figure 1.2(b)

In Set-up Mode, the Upper Row displays the parameter *Name* and the Lower Row displays the corresponding parameter *Value*. Refer Figure 1.2(b) above.

LED INDICATORS

There are 5 front panel 3mm round RED LED indicators described below in table 1.1.

Table 1.1

LED	Status
AUTO	Remains off for Single Channel Version In Dual Channel Version the ON status indicates that the process value indication for channels is updated automatically with user set Scan Time.
AL1	Flashes while Alarm-1 of any one or more channels is active.
AL2	Flashes while Alarm-2 of any one or more channels is active.
AL3	Flashes while Alarm-3 of any one or more channels is active.
AL4	Flashes while Alarm-4 of any one or more channels is active.

KEYS

There are four tactile keys provided on the front panel for setting-up the parameter values and for other functions & commands. The Table 1.2 below lists each key and the associated function.

Table 1.2

Symbol	Key	Function
	SET-UP	Press to enter / exit Set-up Mode.
	DOWN	Press to decrease the parameter value. Pressing once decreases the value by one count; holding the key pressed speeds up the change.
	UP	Press to increase the parameter value. Pressing once increases the value by one count; holding the key pressed speeds up the change.
	ENTER / Alarm ACK	Press to store the set parameter value and to scroll to the next parameter in Set-up Mode. Press to acknowledge / mute alarm output (if active).

Section 2

BASIC OPERATION

POWER-UP

Upon switching on the power to the unit, the display shows the following information for approximately 4 seconds.

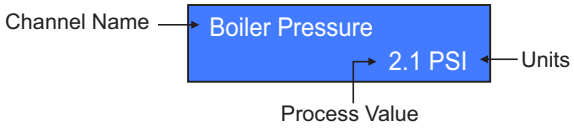
After the power-up display information, the instrument starts showing the process value(s) for Single / Dual Channels. This is the MAIN Display Mode that shall be used most often.

MAIN DISPLAY MODE

This is the default display mode. This mode actually comprises of 4 different screens providing different information. The 4 screens are described below. Use Enter key (press and release) to switch from one screen to the next. The last screen rolls back to the first screen. The multiple information within a selected screen can be viewed using UP / DOWN keys.

Process Value Screen

This is the default screen upon entering the Main Display Mode. The Upper Row shows the Channel Name and the Lower Row shows the corresponding Process Value along with user set Units as shown below.



In case of process value error, the Lower Row indicates the type of error in place of process value and units. The various errors and the respective causes are listed in Table 2.1.

Table 2.1

Error Message	Cause
Over Range	Process Value above Max. Range
Under Range	Process Value below Min. Range
Sensor Open	Thermocouple / RTD broken

In case of Dual Channel, the channel-wise process value indication update depends upon the selected Auto / Manual scan mode. The scan mode can be toggled between Auto and Manual by holding the ENTER key pressed for approximately 5 Seconds. The front panel LED indicator glows ON in Auto mode and remains OFF in manual mode. The channel update rate in Auto mode depends upon the set value (1 to 99 Sec.) for the parameter 'Scan Rate'. In Manual mode, the channels can **only** be scrolled using UP and DOWN keys. However, in Auto Mode though the channels are automatically scrolled with set interval, the UP/DOWN Keys can still be used for quick manual scrolling through channels.

Alarm Status Information Screen

There are up to 4 soft Alarms (AL1, AL2, AL3 and AL4) provided for each channel. If any one or more set Alarms for a channel is active, the channel is said to be under Alarm condition. The channel names under Alarm condition keep flashing on the Upper Row in Process Value screen.

The complete Alarm status information for the channels under Alarm condition is available on this Screen. For example; If Alarm1 (AL1) and Alarm3 (AL3) of a channel named 'Boiler Pressure' is active then the screen displays the following information.

For Dual Channel Version, if both channels are under Alarm condition; use UP / DOWN keys to scroll through the channels for viewing the individual Alarm status information.

Note :
The front panel ENTER key can be used as Alarm - Acknowledge key. Use Alarm Acknowledgment feature to de-activate the Alarm relays. Note that acknowledging the Alarm(s) does not remove the Alarm condition(s).

Recording Information Screen

This screen facilitates viewing information related to the recording feature. Use UP / DOWN keys to scroll through the various information described below in Table 2.2.

Table 2.2

Information	Sample Screen
REMAINING BATCH TIME This information is available if 'Batch Recording' mode is selected and shows the remaining batch time in Hours:Minutes:Seconds (HH:MM:SS) format if the batch is in progress. Upon completion or prior to start of the batch, the remaining time is shown as 0:00:00.	Balance Time>> 1:12:36
NEW RECORDS IN MEMORY Shows the numbers of new records available in the recorder memory for copying (downloading) to Pen-Drive using 'Copy (New)' command.	New Records>> 12523
OLD RECORDS IN MEMORY Shows the numbers of old records available in the recorder memory that were copied (downloaded) in the previous session. These records can be re-copied using 'Re-copy (Old)' command.	Old Records>> 10067
FREE SPACE AVAILABLE FOR NEW RECORDS Shows the recorder memory space available for new records. That is, this information shows how many more new records can be stored in the memory before it gets full.	Free Space>> 3833410
DATE STAMP FOR THE FIRST NEW RECORD IN THE MEMORY This information shows the calendar date of recording of the first available new record in the memory. This information does not appear if there are no new records in the memory.	First Record>> Date: 01:01:20
TIME STAMP FOR THE FIRST NEW RECORD IN THE MEMORY This information shows the clock time of recording of the first available new record in the memory. This information does not appear if there are no new records in the memory.	First Record>> Time: 23:05:40

Information	Sample Screen
DATE STAMP FOR THE LAST NEW RECORD IN THE MEMORY This information shows the calendar date of recording of the latest available new record in the memory. This information does not appear if there are no new records in the memory.	Last Record>> Date: 02:01:20
TIME STAMP FOR THE LAST NEW RECORD IN THE MEMORY This information shows the clock time of recording of the latest available new record in the memory. This information does not appear if there are no new records in the memory.	Last Record>> Time: 14:12:10

RTC Screen

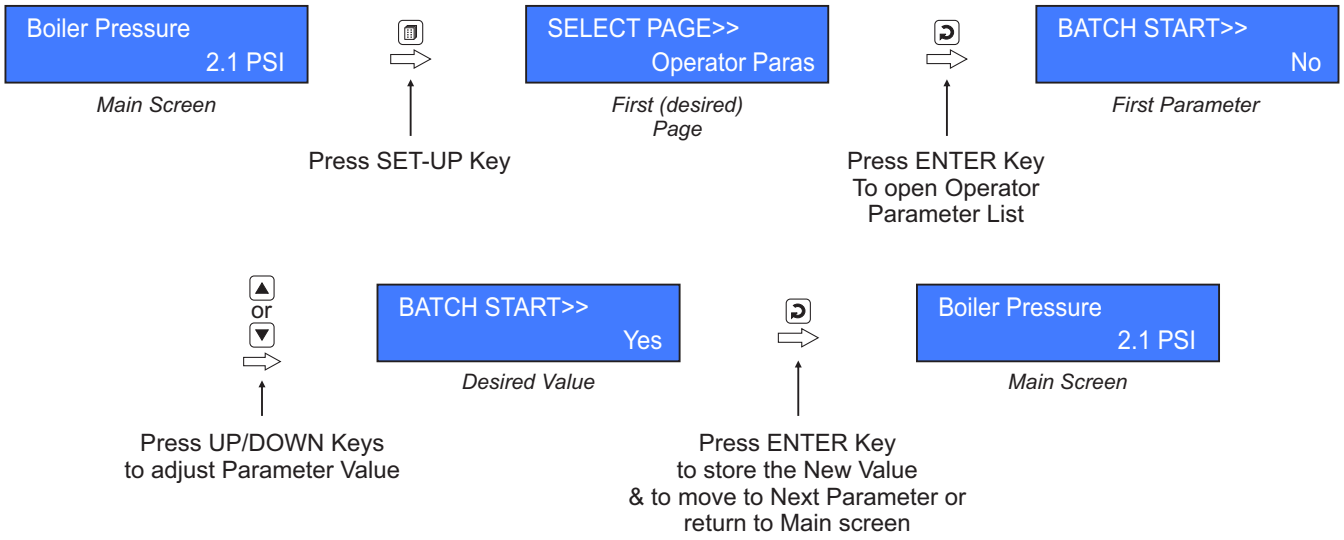
This screen provides the Real Time Clock (RTC) information as shown below. The upper row shows the current calendar date in dd/mm/yy format and the lower row shows the running clock time in hh:mm:ss (24 Hours) format.

Section 3

OPERATOR PARAMETERS

The Figure 3.1 shows how to access Operator Parameters. The Example illustrates how to start batch recording.

Figure 3.1



The Table 3.1 below described the Operator Parameters in detail.

Table 3.1

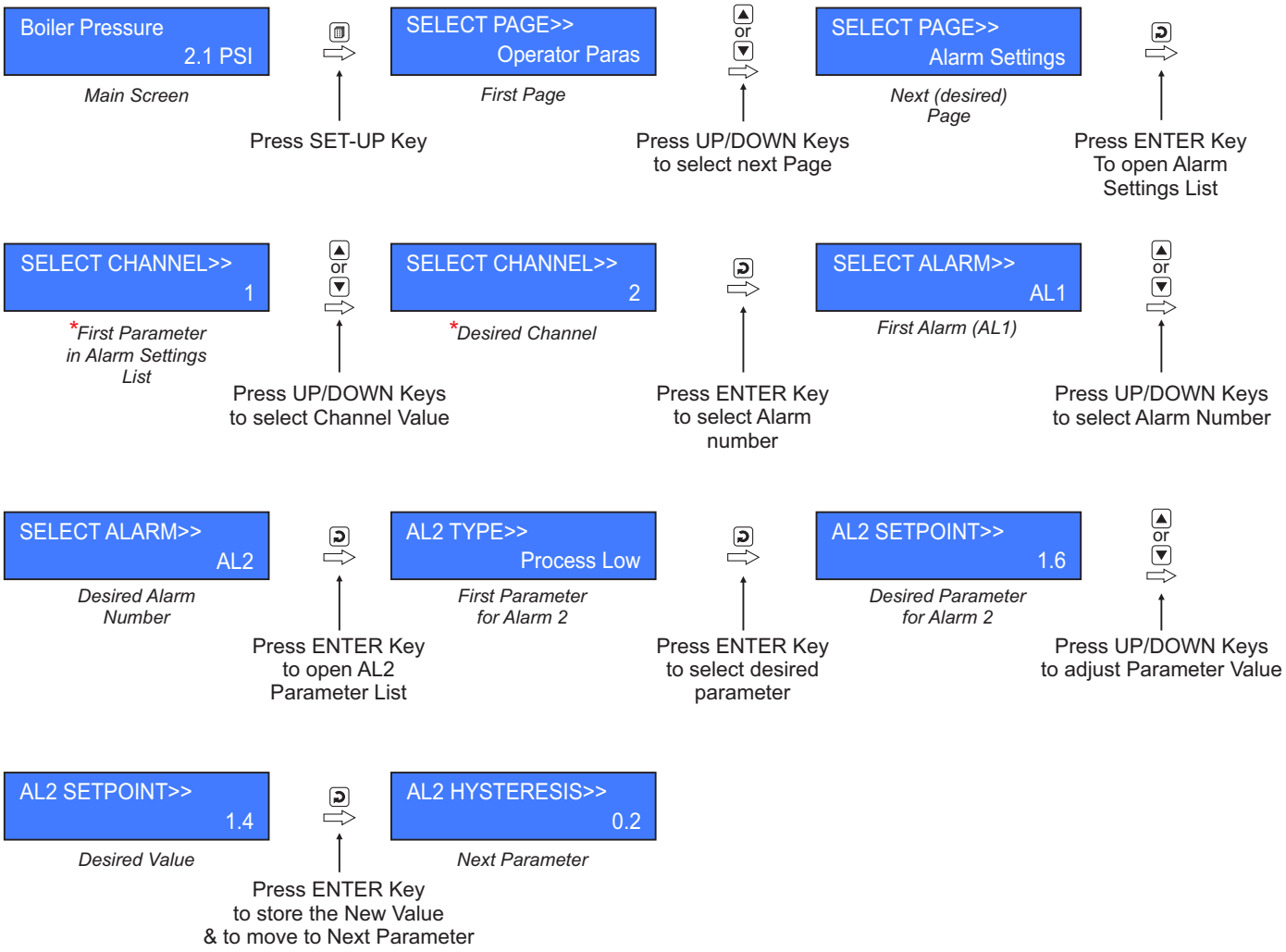
Parameter Description	Settings
BATCH START *(Available if Batch Recording is selected)* This parameter is presented only if the batch is not already started. Set BATCH START command to 'Yes' to start recording the data. This is usually issued at the begin of a batch process.	No Yes
BATCH STOP *(Available if Batch Recording is selected)* This parameter is presented only if the batch is already started. Through the Batch Recording automatically stops at the end of the set time interval; there may be a need to abort recording any time during the batch. Set BATCH STOP command to 'Yes' to stop recording the data and terminate the batch.	No Yes

Section 4

ALARM SETTINGS

The Figure 4.1 shows how to access Alarm Setting Parameters. The Example illustrates how to change the Alarm 2 setpoint value for channel 2.

Figure 4.1



*** Parameters not present in Single Channel Version**

Table : 4.1

Parameter Description	Settings (Default Value)
SELECT CHANNEL (***Available only for Dual Channel Version***) Select the desired Channel Name whose Alarms parameters are to be set.	1 or 2

Parameter Description	Settings (Default Value)
SELECT ALARM Select the desired Alarm Number whose parameters are to be set.	AL1, AL2, AL3, AL4 (The actual available options depends on the numbers of Alarms set per channel on Alarm configuration page)
ALx TYPE *x = 1, 2, 3 or 4 depending upon the Alarm selected : AL1, AL2, AL3 or AL4* **None :** Disable Alarm. **Process Low :** The Alarm activates when the PV equals or falls below the 'Alarm Setpoint' value. **Process High :** The Alarm activates when the PV equals or exceeds the 'Alarm Setpoint' value.	None Process Low Process High (Default : None)
ALx SETPOINT *x = 1, 2, 3 or 4 depending upon the Alarm selected : AL1, AL2, AL3 or AL4* Setpoint Value for 'Process High' or 'Process Low' Alarm.	Min. to Max. of selected input type range (Default : 0)
ALx HYSTERESIS *x = 1, 2, 3 or 4 depending upon the Alarm selected : AL1, AL2, AL3 or AL4* This parameter Value sets a differential (dead) band between the ON and OFF Alarm states.	1 to 30000 (Default : 20)
ALx INHIBIT *x = 1, 2, 3 or 4 depending upon the Alarm selected : AL1, AL2, AL3 or AL4* **No :** The Alarm is not suppressed during the start-up Alarm conditions. **Yes :** The Alarm activation is suppressed until the PV is within Alarm limits from the time the Recorder is switched ON.	No Yes (Default : No)

Section 5

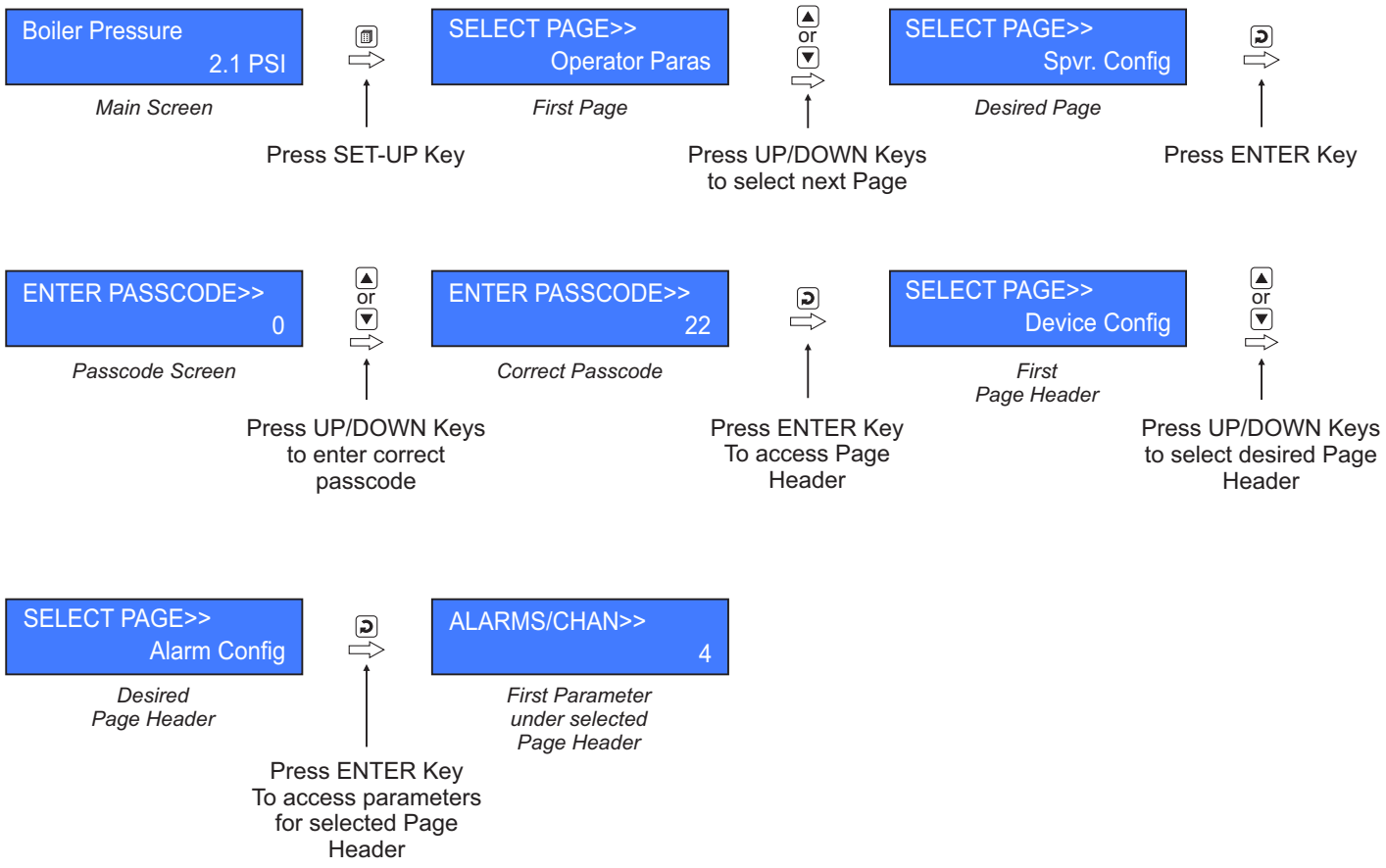
SUPERVISORY CONFIGURATION

The Page Header 'Spvr. Config' encompasses a subset of Page Headers containing parameters that are set less frequently. These parameters should only be accessible to Supervisory level and thus are protected by password. Upon entering the appropriate password for the parameter 'ENTER PASSCODE' , the following list of Page Header is available.

1. Device Configuration (*Device Config*)
2. Channel Configuration (*Channel Config*)
3. Alarm Configuration (*Alarm Config*)
4. Recorder Configuration (*Recorder Config*)
5. RTC Settings (*RTC Settings*)
6. Utilites (*Utilites*)
7. Return to Main Mode (*Exit*)

The figure below illustrates how to access the parameters under the supervisory Page Header "Alarm Configuration". The parameters covered under each Page Header are described in detail in the following sections.

Figure 5.1



Section 6

DEVICE CONFIGURATION

Table : 6.1

Parameter Description	Settings (Default Value)
SCAN RATE This parameter value sets the time interval for which each channel is displayed. In other words, the rate at which the channels are sequentially updated for indication.	1 Sec. to 99 Sec. (Default : 3 Sec.)
DELETE RECORDS Setting this command to 'Yes', erases all the records stored in the internal Memory.	No Yes (Default : No)
RECORDER ID This parameter assigns a unique identification number to the ScanLog which is then used in file naming system for downloading the records to the PC.	1 to127 (Default : 1)

Section 7

CHANNEL CONFIGURATION

The Channel configuration parameters are listed in Table below and are generally required to be set only at the time of installation.

Table : 7.1

<table>
<tr><th>Parameter Description</th><th>Settings
(Default Value)</th></tr>
<tr><td>SELECT CHANNEL
(This parameter is available for Dual Channel Version only)

Select the channel for which parameter settings are desired.</td><td>1 or 2</td></tr>
<tr><td>INPUT TYPE
Set the type of Thermocouple / RTD / DC Linear signal input type connected to the selected channel.</td><td>Refer Table 7.2
(Default : 0 to 10 V)</td></tr>
<tr><td>RESOLUTION
Set the process value indication resolution (decimal point). All the resolution based parameters (Hysteresis, Alarm Setpoints etc.) then follow this resolution setting.</td><td>Refer Table 7.2</td></tr>
<tr><td>UNITS
Select the Units that shall be displayed along with the measured PV on the display. For temperature input (Thermocouple & RTD), only °C and °F units are available and represent actual converted values. All other units available for DC Linear signal input are for indication purpose only and should be selected as per the units specified by the transmitter.</td><td>Refer Table 7.3
(Default : °C)</td></tr>
<tr><td>SIGNAL LOW
(Applicable only for DC Linear Inputs)

The transmitter output signal value corresponding to RANGE LOW process value.

Refer Appendix-A : DC Linear Signal Interface for details.</td><td>
<table>
<tr><th>Input Type</th><th>Settings</th><th>Default</th></tr>
<tr><td>0 to 20 mA</td><td>0.00 to Signal High</td><td>0.00</td></tr>
<tr><td>4 to 20 mA</td><td>4.00 to Signal High</td><td>4.00</td></tr>
<tr><td>0 to 80 mV</td><td>0.00 to Signal High</td><td>0.00</td></tr>
<tr><td>0 to 1.25 V</td><td>0.000 to Signal High</td><td>0.000</td></tr>
<tr><td>0 to 5 V</td><td>0.000 to Signal High</td><td>0.000</td></tr>
<tr><td>0 to 10 V</td><td>0.00 to Signal High</td><td>0.00</td></tr>
<tr><td>1 to 5 V</td><td>1.000 to Signal High</td><td>1.000</td></tr>
</table>
</td></tr>
<tr><td>SIGNAL HIGH
(Applicable only for DC Linear Inputs)

The transmitter output signal value corresponding to RANGE HIGH process value.

Refer Appendix-A : DC Linear Signal Interface for details.</td><td>
<table>
<tr><th>Input Type</th><th>Settings</th><th>Default</th></tr>
<tr><td>0 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr>
<tr><td>4 to 20 mA</td><td>Signal Low to 20.00</td><td>20.00</td></tr>
<tr><td>0 to 80 mV</td><td>Signal Low to 80.00</td><td>80.00</td></tr>
<tr><td>0 to 1.25 V</td><td>Signal Low to 1.250</td><td>1.250</td></tr>
<tr><td>0 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr>
<tr><td>0 to 10 V</td><td>Signal Low to 10.00</td><td>10.00</td></tr>
<tr><td>1 to 5 V</td><td>Signal Low to 5.000</td><td>5.000</td></tr>
</table>
</td></tr>
</table>

Parameter Description	Settings (Default Value)
RANGE LOW **(Applicable only for DC Linear Inputs)** The Process Value corresponding to the SIGNAL LOW value from the transmitter. Refer Appendix-A : DC Linear Signal Interface for details.	-30000 to +30000 (Default : 0)
RANGE HIGH **(Applicable only for DC Linear Inputs)** The Process Value corresponding to the SIGNAL HIGH value from the transmitter. Refer Appendix-A : DC Linear Signal Interface for details.	-30000 to +30000 (Default : 1000)
LOW CLIPPING **(Applicable only for DC Linear Inputs)** Refer Appendix-B.	Disable Enable (Default : Disable)
LOW CLIP VAL **(Applicable only for DC Linear Inputs)** Refer Appendix-B.	-30000 to HIGH CLIP VAL (Default : 0)
HIGH CLIPPING **(Applicable only for DC Linear Inputs)** Refer Appendix-B.	Disable Enable (Default : Disable)
HIGH CLIP VAL **(Applicable only for DC Linear Inputs)** Refer Appendix-B.	LOW CLIP VAL to 30000 (Default : 1000)
ZERO OFFSET In many application, the measured **PV** at the input requires a constant value to be added or subtracted to obtain a final process value for removing sensor zero error or to nullify known thermal gradient. Actual (Displayed) PV = Measured PV + Offset for PV.	-30000 to +30000 (Default : 0)

Table 7.2

<table>
<tr><th>Option</th><th>Range (Min. to Max.)</th><th>Resolution & Unit</th></tr>
<tr><td>Type J (Fe-K)</td><td>0.0 to +960.0°C / +32.0 to +1760.0°F</td><td rowspan="9">1 °C /°F
or
0.1 °C /°F</td></tr>
<tr><td>Type K (Cr-Al)</td><td>-200.0 to +1376.0°C / -328.0 to +2508.0°F</td></tr>
<tr><td>Type T (Cu-Con)</td><td>-200.0 to +387.0°C / -328.0 to +728.0°F</td></tr>
<tr><td>Type R (Rh-13%)</td><td>0.0 to +1771.0°C / +32.0 to +3219.0°F</td></tr>
<tr><td>Type S (Rh-10%)</td><td>0.0 to +1768.0°C / +32.0 to +3214.0°F</td></tr>
<tr><td>Type B</td><td>0.0 to +1826.0°C / +32.0 to +3218.0°F</td></tr>
<tr><td>Type N</td><td>0.0 to +1314.0°C / +32.0 to +2397.0°F</td></tr>
<tr><td colspan="2">Reserved for customer specific Thermocouple type not listed above. The type shall be specified in accordance with the ordered (optional on request) Thermocouple type.</td></tr>
<tr><td>RTD Pt100</td><td>-199 to +600 °C / -328 to +1112 °F
or
-199.9 to +600.0 °C / -328.0 to +1112.0 °F</td><td>1°C
or
0.1 °C</td></tr>
<tr><td>0 to 20 mA</td><td rowspan="3">-30000 to 30000 units</td><td rowspan="9">1 Unit
0.1 Unit
0.01 Unit
0.001 Unit</td></tr>
<tr><td>4 to 20 mA</td></tr>
<tr><td>0 to 80 mV</td></tr>
<tr><td colspan="2">Reserved</td></tr>
<tr><td>0 to 1.25 V</td><td rowspan="4">-30000 to 30000 units</td></tr>
<tr><td>0 to 5 V</td></tr>
<tr><td>0 to 10 V</td></tr>
<tr><td>1 to 5 V</td></tr>
</table>

Table 7.3

Option	Description
°C	Degree Centigrade
°F	Degree Fahrenheit
(none)	No Unit (Blank)
°K	Degree Kelvin
EU	Engineering Units
%	Percentage
Pa	Pascals
Mpa	Mpascals
kPa	Kpascals
bar	Bar
mbar	Milli bar
psi	PSI
kg/sq.cm	kg/cm²
mmH_2O	mm water gauge
inH_2O	Inches water gauge
mmHg	mm mercury
Torr	Torr
litre/hr	Litres per hour
litre/min	Litres per minute
%RH	% Relative Humidity
$\%O^2$	% Oxygen
$\%CO^2$	% Carbon di-oxide
%CP	% Carbon Potential
V	Volts
A	Amps

Option	Description
mA	Milli Amps
mV	Milli Volts
ohm	Ohms
ppm	Parts per million
rpm	Revolutions per minute
mSec	Milli seconds
Sec	Seconds
min	Minutes
hrs	Hours
PH	PH
%PH	%PH
miles/hr	Miles per hour
mg	Milli grams
g	Grams
kg	Kilo grams

Section 8

ALARM CONFIGURATION

Table : 8.1

Parameter Description	Settings (Default Value)
ALARMS/CHAN The ScanLog is provided with 4 independently settable soft Alarms per channel. However, the actual number of Alarms required per channel may vary from application to application. This parameter allows selecting the exact number of Alarms required per channel.	1 to 4 (Default : 4)
RELAY-1 LOGIC **RELAY-2 LOGIC** Relay-1 is common for Alarm 1 & Alarm 3 for all channels. Relay-2 is common for Alarm 2 & Alarm 4 for all channels. **Normal :** The Relay remains ON under Alarm condition; OFF otherwise. Useful for activating Audio / Visual Alarm. **Reverse :** The Relay remains OFF under Alarm condition; ON otherwise. Useful for Tripping the system under monitoring.	Normal Reverse (Default : Normal)

Section 9

RECORDER CONFIGURATION

Table : 9.1

Parameter Description	Settings (Default Value)
NORMAL INTERVAL The ScanLog respects this parameter value for generating periodic records when none of the channels is under Alarm. For e.g., If this parameter value is set to 0:00:30, then a new record is generated every 30 Second if no channel is in Alarm. Setting this parameter value to 0:00:00 disables normal recording.	0:00:00 (H:MM:SS) to 2:30:00 (H:MM:SS) (Default : 0:00:30)
ZOOM INTERVAL The ScanLog respects this parameter value for generating periodic records when any one or more channels are under Alarm. For e.g., If this parameter value is set to 0:00:10, then a new record is generated every 10 Second whenever there is any channel(s) is in Alarm. Setting this parameter value to 0:00:00 disables zoom recording.	0:00:00 (H:MM:SS) to 2:30:00 (H:MM:SS) (Default : 0:00:10)
ALRM TOGGL REC Set to 'Enable' if a record is to be generated every time the Alarm status for any of the channels is toggled (On-to-Off or Off-to-On).	Disable Enable (Default : Enable)
RECORDING MODE **Continuous** The ScanLog keeps generating records indefinitely. There are no Start / Stop commands. Suitable for continuous processes. **Batch** The ScanLog generates records over a preset time interval. The recording begins upon issuance of Start command and continues until the user set time interval is elapsed. Suitable for batch processes.	Continuous Batch (Default : Continuous)
BATCH TIME *(Available for Batch Recording Mode)* Sets the time period in Hours:Minutes for which the recording to take place from the time the Start command is issued.	0:01 (HH:MM) to 250:00 (HHH:MM) (Default : 1:00)
BATCH START **BATCH STOP** These two parameters are also available on Operator parameter list. Refer Section 4 : Operator Parameters.	No Yes

Section 10

RTC SETTING

Table : 10.1

Parameter Description	Settings
TIME (HH:MM) Set current clock time in Hrs:Min (24 Hours format).	0.0 to 23:59
DATE Set current calendar date.	1 to 31
MONTH Set current calendar month.	1 to 12
YEAR Set current calendar year.	2000 to 2099

Section 11

UTILITIES

Table : 11.1

Parameter Description	Settings (Default Value)
LOCK **UNLOCK** These parameters lock or unlock parameter settings. Locking inhibits editing (modifying) of parameter values to prevent any inadvertent changes by the operator. The Parameters 'Lock' and 'Unlock' are mutually exclusive. When in locked condition, the instrument asks for UNLOCK (Yes / No). Set the parameter to 'Yes' and the instrument returns to Main Mode. Access this parameter again to set the value for UNLOCK to 'Yes'. The instrument returns to Main mode with lock open. For locking, the parameter LOCK needs to be set to 'Yes' only once.	No Yes (Default : No)
FACTORY DEFAULT Setting this parameter to 'Yes', resets all parameters to their default values. The instrument resets & restarts.	No Yes (Default : No)

Section 12

MECHANICAL INSTALLATION

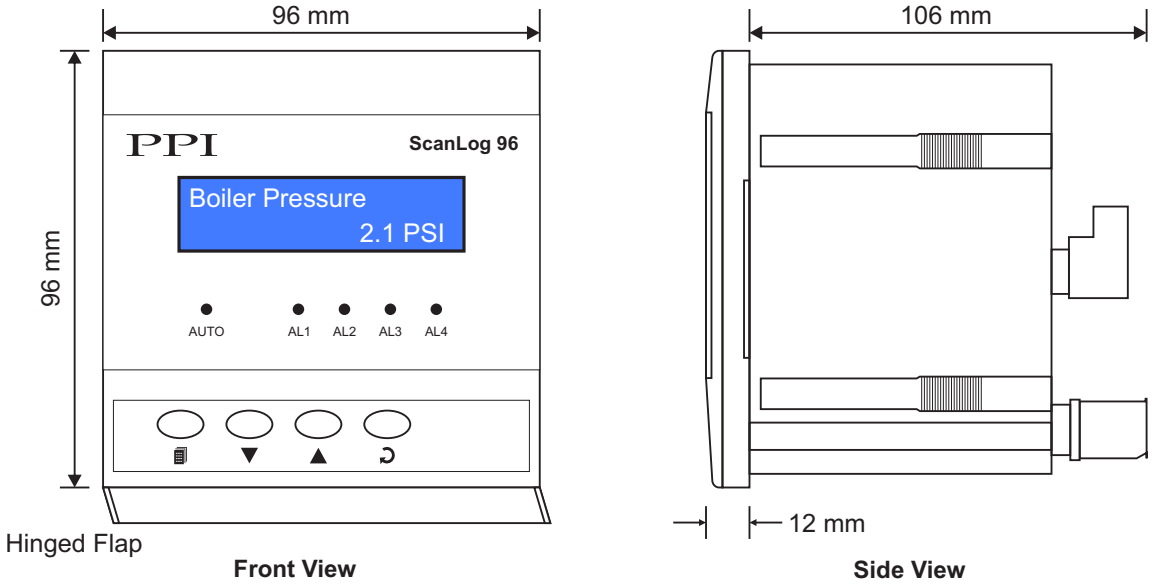
The following precautions should be strictly observed while installing the instrument:

1. The place of installation should be free of corrosive/combustible gases and electrically conductive pollution.
2. Ensure that the place of installation is not subject to rapid ambient changes that can cause condensation. Also the Ambient Temperature and Relative Humidity surrounding the instrument should not exceed the maximum specified for the proper operation of the instrument.
3. The place of installation should be adequately protected against excessive electrostatic or electromagnetic interference.
4. The instrument should not be subject to direct vibration or shock.
5. The instrument should not be exposed to dust, salt air, direct sunlight or radiant heat.

OUTER DIMENSIONS

The Figure 12.1 shows the outer dimensions.

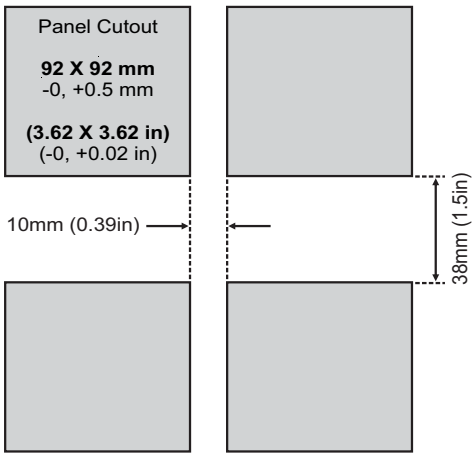
Figure 12.1



PANEL CUTOUT AND RECOMMENDED MINIMUM SPACING

The Figure 12.2 shows the panel cutout requirements for a single instrument and also the minimum spacing recommended if several instruments are required to be mounted on a single panel.

Figure 12.2

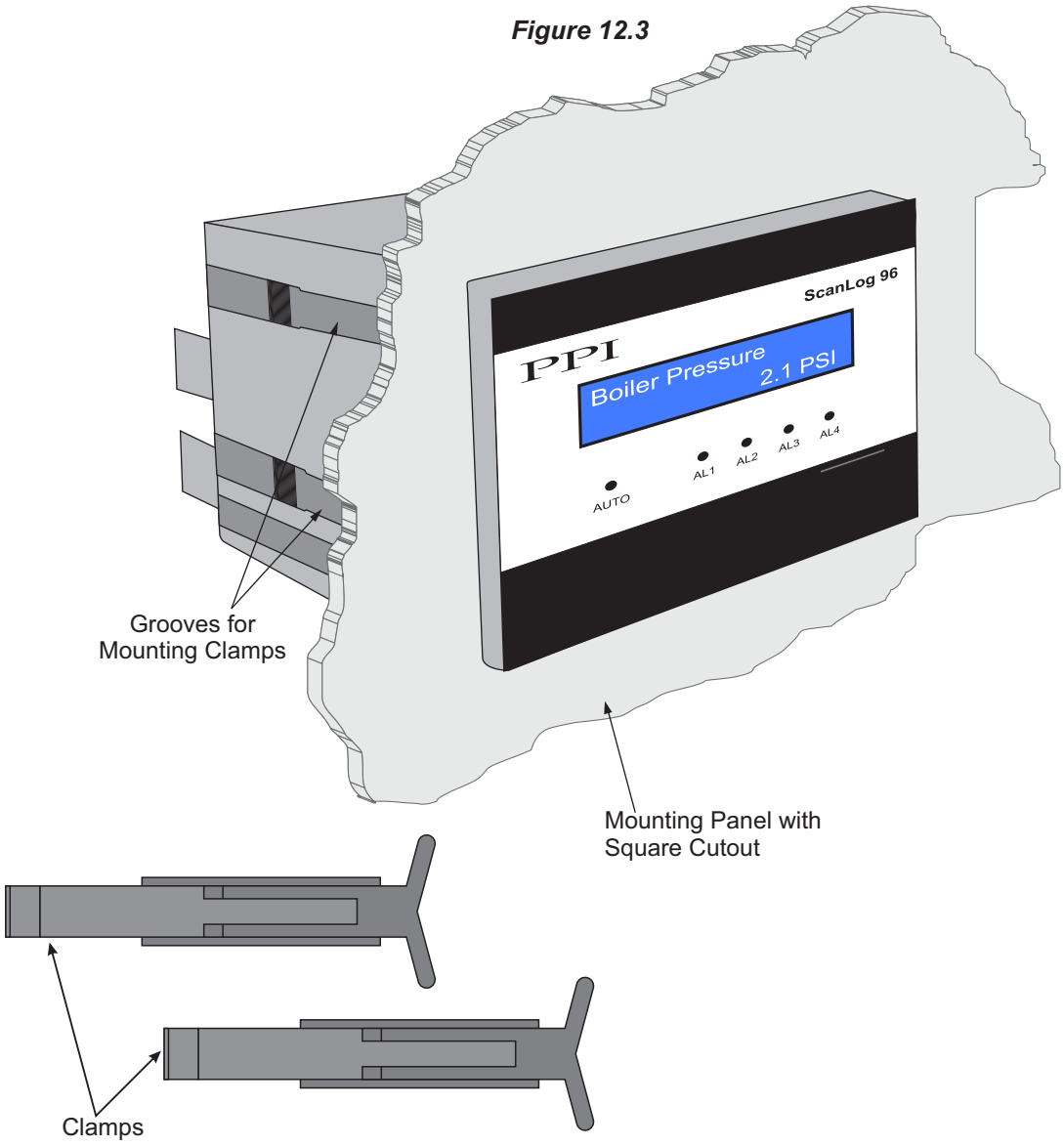


PANEL MOUNTING

Follow the steps below for mounting the instrument on panel:

1. Prepare a rectangular cutout to the size shown in Figure 12.2.
2. Remove the Panel Mounting Clamps from the instrument Enclosure.
3. Insert the rear of the instrument housing through the panel cutout from the front of the mounting panel.
4. Hold the instrument gently against the mounting panel such that it positions correctly against the panel wall, see Figure 12.3. Apply pressure only on the bezel and not on the front label.
5. Insert the clamps on either side of the enclosure in the grooves provided and slide them forward until this are firmly in contact with the rear face of the mounting panel. Refer Figure 12.3 below. There are 2 clamps per side, that is, total 4 clamps.

Figure 12.3



Section 13

ELECTRICAL CONNECTIONS

WARNING

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

Caution

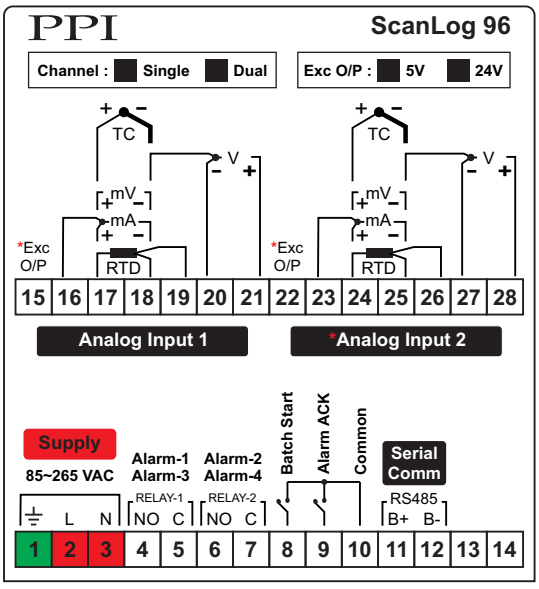
The ScanLog is designed for installation in an enclosure which provides adequate protection against electric shock. Local regulations regarding electrical installation should be rigidly observed. Consideration should be given to prevention of access to the Power Supply terminals by unauthorized personnel.

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 recorder.
3. Run power supply cables separated from the low-level signal cables (like Thermocouple, RTD, 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 recorder 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 power supply is switched-off while making / removing any connections.

CONNECTION DIAGRAM

The Electrical Connection Diagram is shown on the Top Side of the enclosure. Refer figure 13.1.

Figure 13.1



***Notes:**

1. Analog Input 2 connections (terminals 23 to 28) are applicable only for Dual Channel version.
2. Excitation Voltage output (terminals 15 & 22) is available optionally.

Input Channels (Analog Input 1 & Analog Input 2)

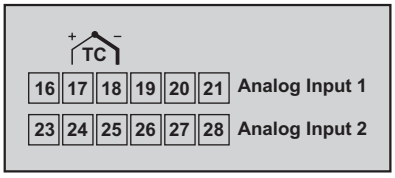
Channel 1 & Channel 2 are designed to interface with Thermocouples, RTD Pt100, mA, mV & V. The wiring connections for each type are described below.

Thermocouple

Connect Thermocouple Positive (+) and Negative (-) as shown in **Figure 13.2(a)**.

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.

Figure 13.2(a)

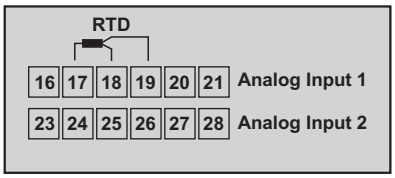


RTD Pt100, 3-wire

Connect single leaded end and the double leaded ends of **RTD** bulb as shown in **Figure 13.2(b).** Double leaded connections are interchangeable for respective channel.

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.

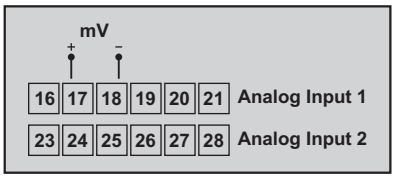
Figure 13.2(b)



DC Linear mV

Use a shielded twisted pair with the shield grounded at the signal source for connecting mV source. Connect common (-) and the signal (+) wires as shown in **Figure 13.2(c).**

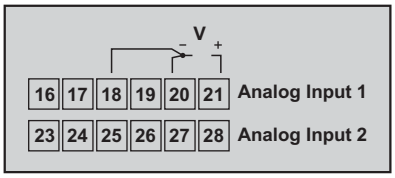
Figure 13.2(c)



DC Linear V

Use a shielded twisted pair with the shield grounded at the signal source for connecting V source. Connect common (-) and the signal (+) wires as shown. Also short terminals 18 & 20 for Channel 1 and terminals 25 & 27 for Channel 2, respectively. Refer **Figure 13.2(d).**

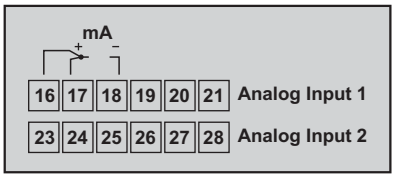
Figure 13.2(d)



DC Linear Current (mA)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA source. Connect common (-) and the signal (+) wires as shown. Also short terminals 16 & 17 for Channel 1 and terminals 23 & 24 for Channel 2, respectively. Refer **Figure 13.2(e).**

Figure 13.2(e)

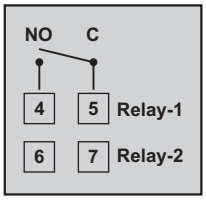


ALARM OUTPUTS

Two Relay outputs, Relay-1 & Relay-2, are available as common Alarm Outputs. Relay-1 is common Alarm-1 & Alarm-3 of all channels. Relay-2 is common Alarm-2 & Alarm-4 of all channels.

Relay contacts, N/O (Normally Open) & C (Common), are rated 2A/240 VAC (resistive load).

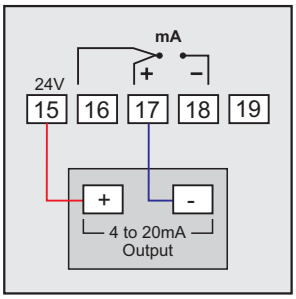
Figure 13.3



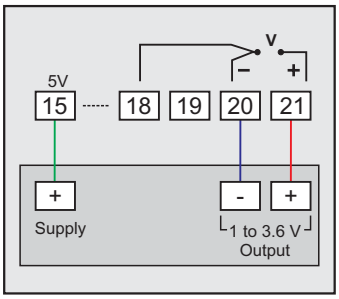
DC EXCITATION VOLTAGE

The ScanLog is optionally supplied with 24 VDC @ 40 mA **or** 5VDC @ 15 mA power source. This is primarily meant for exciting 2-wire or 4-wire Current / Voltage output transmitters.

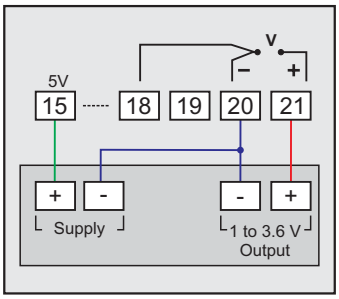
For wiring convenience the excitation voltage is made available on two separate terminals (15 & 22). The following figures illustrate a few connection examples for channel 1.



2-wire Current Transmitter
(24VDC Supply)



3-wire Voltage Transmitter
(5VDC Supply)

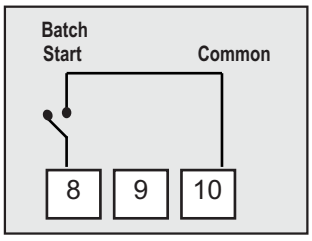


4-wire Voltage Transmitter
(5VDC Supply)

DIGITAL INPUT FOR BATCH START COMMAND

Connect a remote potential-free contact closure switch for the purpose of issuing the Batch - Recording START command. An 'OPEN' to 'CLOSE' change-over of the contacts initiates time based batch recording. Once the recording starts, the change in the contact status has no effect.

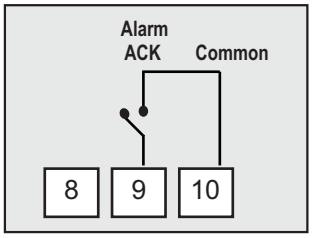
Figure 13.4 (a)



DIGITAL INPUT FOR ALARM ACKNOWLEDGE

Connect a remote potential-free contact closure switch for the purpose of issuing Alarm Acknowledgment. An 'OPEN' to 'CLOSE' change-over of the contacts acknowledges the alarm and mutes the alarm relay(s)

Figure 13.4 (b)



SERIAL COMMUNICATION PORT

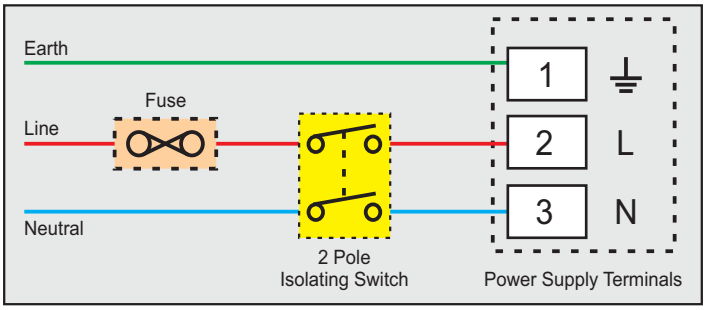
The PC Communication Port is RS485. Use appropriate protocol converter (say, RS485 - RS232 or USB - RS485) for interfacing with PC.

For reliable noise free communication, use a pair of twisted wires inside screened cable. The wire should have less than 100 ohms / km nominal DC resistance (Typically 24 AWG or thicker). Connect the terminating resistor (Typically 100 to 150 ohm) at one end to improve noise immunity.

POWER SUPPLY

As standard, the module is supplied with power connections suited for 85 to 264 VAC line supply. 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 13.5. The module is not provided with fuse and power switch. If necessary, mount them separately. Use a time lag fuse rated 1A @ 240 VAC.

Figure 13.5



APPENDIX A
DC LINEAR SIGNAL INTERFACE

This appendix describes the parameters required to interface process transmitters that produce Linear DC Voltage (mV/V) or Current (mA) signals in proportion to the measured process values. A few examples of such transmitters are;

1. Pressure Transmitter producing **4 to 20 mA** for **0 to 5 psi**
2. Relative Humidity Transmitter producing **1 to 4.5 V** for **5 to 95 %RH**
3. Temperature Transmitter producing **0 to 20 mA** for **-50 to 250 °C**

The instrument (indicator / controller / recorder) that accepts the linear signal from the transmitter computes the measured process value by solving the mathematical equation for Straight-Line in the form:

$$Y = mX + C$$

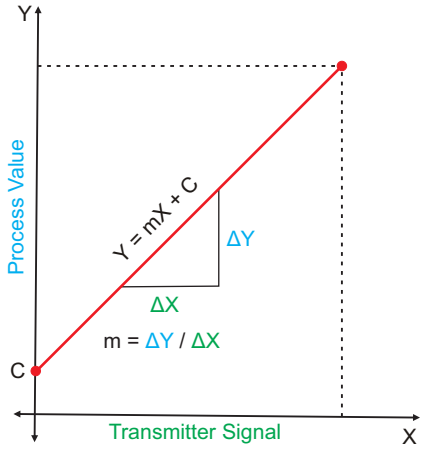
Where;

X : Signal Value from Transmitter

Y : Process Value Corresponding to Signal Value X

C : Process Value Corresponding to X = 0 (Y-intercept)

m : Change in Process Value per unit Change in Signal Value (Slope)



As is evident from the aforementioned transmitter examples, different transmitters produce signals varying both in *Type* (mV/V/mA) and *Range*. Most PPI instruments, thus, provide programmable Signal Type and Range to facilitate interface with a variety of transmitters. A few industry standard signal types and ranges offered by the PPI instruments are: 0-80mV, 0-5 V, 1-5 V, 0-10V, 0-20 mA, 4-20 mA, etc.

Also, the output signal range (e.g. 1 to 4.5 V) from different transmitters corresponds to different process value range (e.g. 5 to 95 %RH); the instruments thus also provide facility for programming the measured process value range with programmable Resolution.

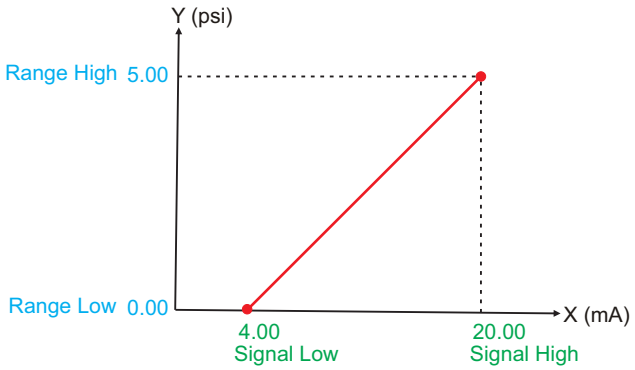
The linear transmitters usually specify two signal values (Signal Low and Signal High) and the corresponding Process Values (Range Low and Range High). In the example Pressure Transmitter above; the Signal Low, Signal High, Range Low & Range High values specified are: 4 mA, 20 mA, 0 psi & 5 psi, respectively.

In summary, the following 6 parameters are required for interfacing Linear Transmitters:

1. Input Type : Standard DC Signal Type in which the transmitter signal range fits (e.g. 4-20 mA)
2. Signal Low : Signal value corresponding to Range Low process value (e.g. 4.00 mA)
3. Signal High : Signal value corresponding to Range High process value (e.g. 20.00 mA)
4. PV Resolution : Resolution (least count) with which to compute process value (e.g. 0.01)
5. Range Low : Process value corresponding to Signal Low value (e.g. 0.00 psi)
6. Range High : Process value corresponding to Signal High value (e.g. 5.00 psi)

The following examples illustrate appropriate parameter value selections.

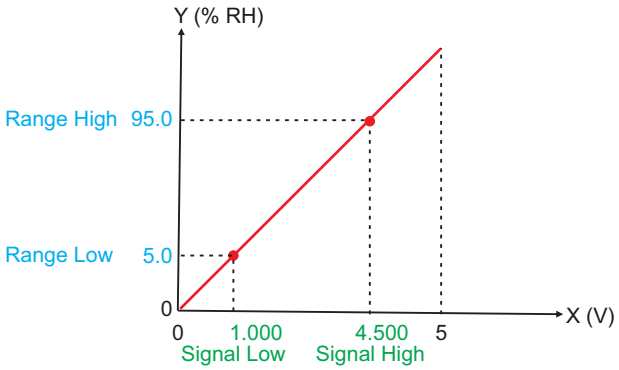
Example 1: Pressure Transmitter producing **4 to 20 mA** for **0 to 5 psi**



Presume the pressure is to be measured with 0.01 Resolution, that is 0.00 to 5.00 psi.

Input Type	:	4-20 mA
Signal Low	:	4.00 mA
Signal High	:	20.00 mA
PV Resolution	:	0.01
Range Low	:	0.00
Range High	:	5.00

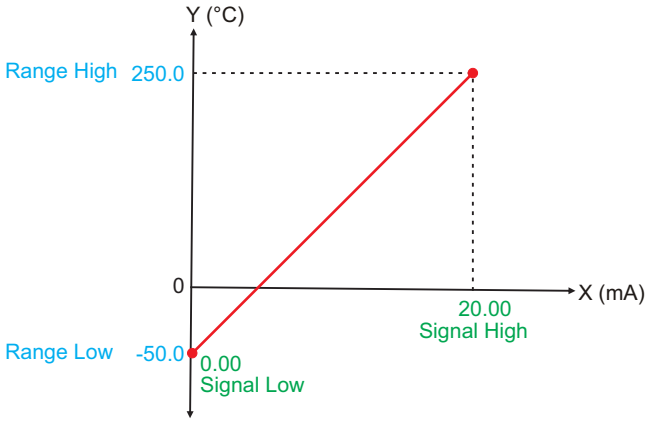
Example 2: Relative Humidity Transmitter producing **1 to 4.5 V** for **5 to 95 %RH**



Presume the humidity is to be measured with 0.1 Resolution, that is 0.0 to 100.0 %.

Input Type	:	0-5 V
Signal Low	:	1.000 V
Signal High	:	4.500 V
PV Resolution	:	0.1
Range Low	:	5.0
Range High	:	95.0

Example 3: Temperature Transmitter producing **0 to 20 mA** for **-50 to 250 °C**



Presume the Temperature is to be measured with 0.1 Resolution, that is -50.0 to 250.0°C.

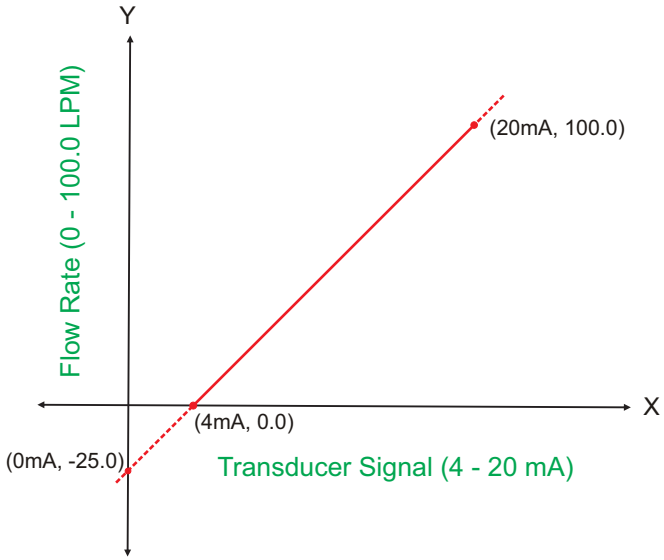
Input Type	:	0-20 mA
Signal Low	:	0.00 mA
Signal High	:	20.00 mA
PV Resolution	:	0.1
Range Low	:	-50.0
Range High	:	250.0

APPENDIX B
LOW / HIGH CLIPPING

For mA/mV/V inputs the measured PV is a scaled value between the set values for 'PV Range Low' and 'PV Range High' parameters corresponding to the Signal Minimum and Signal Maximum values respectively. Refer Appendix A.

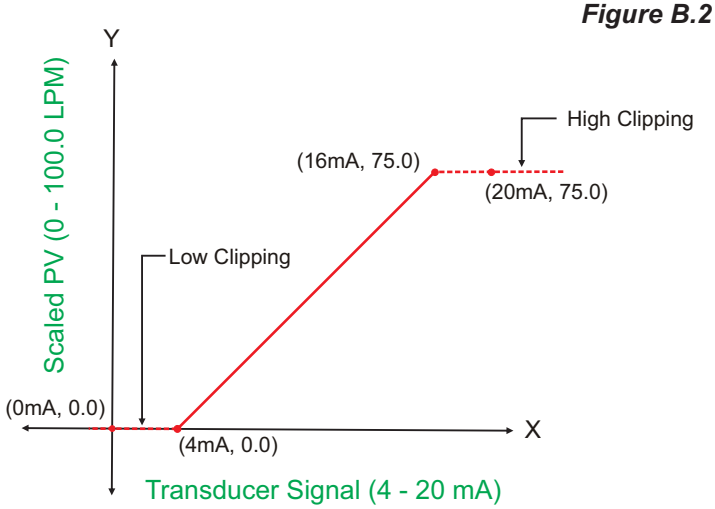
The Figure B.1 below illustrates an example of flow rate measurement using a transmitter / transducer producing a signal range of 4 - 20 mA corresponding to 0.0 to 100.0 Liters per Minute (LPM).

Figure B.1



If this transmitter is to be used for a system having a flow rate range of 0.0 to 75.0 LPM then the actual useful signal range from the example transmitter is 4 mA (~ 0.0 LPM) to 16 mA (~ 75.0 LPM) only. If no Clipping is applied on the measured flow rate then the scaled PV will also include 'out-of-range' values for the signal values below 4 mA and above 16 mA (may be due to open sensor condition or calibration errors). These out-of-range values can be suppressed by enabling the Low and/or High Clippings with appropriate Clip values as shown in figure B.2 below.

Figure B.2



Parameter Values

PV Range Low	: 0.0
PV Range High	: 100.0
Enable Low Clipping	: Yes
Low Clip Value	: 0.0
Enable High Clipping	: Yes
High Clip Value	: 75.0

PPI
The Perfection Experts

Process Precision Instruments

101, Diamond Industrial Estate, Navghar, Vasai Road (E),
Dist. Palghar - 401 210.Maharashtra, India
Sales : 8208199048 / 8208141446
Support : 07498799226 / 08767395333
sales@ppiindia.net, support@ppiindia.net

Jan 2022