ScanexPlus

PPI
The Perfection Experts

Multi-Channel Universal Process Value Scanner with Common High / Low Alarms

User Manual

CONTENTS

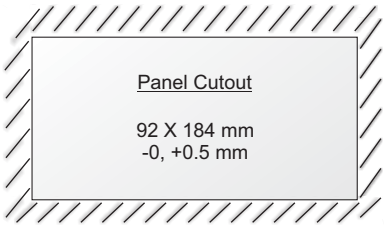
Section 1

PANEL MOUNTING AND ELECTRICAL CONNECTIONS

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

PANEL CUTOUT

Figure 1.1



PANEL MOUNTING

Follow the steps below for mounting the instrument on panel :

1. Prepare a cutout to the size shown in Figure 1.1.
2. Remove the Panel Mounting Clamp from the instrument Enclosure.
3. Insert the rear of the enclosure through the panel cutout from the front of the mounting panel.
4. Fix the mounting clamp pair such that it ensures secured mounting of the enclosure against the panel wall.

ELECTRICAL CONNECTIONS

Observe the followings while making electrical connections.

1. Run power supply cables separated from sensor (Thermocouple/RTD/mA/mV/V) cables. If the cables are run through conduits, use separate conduits for power supply cable and sensor cables.
2. Use appropriate fuses and switches, wherever necessary, for driving the high voltage loads to protect the instrument from any possible damage due to high voltage surges of extended duration or short-circuits on loads.
3. Switch-off the power supply while making / removing any connections.

The Figure 1.2(a) & Figure 1.2(b) shows the **Old** terminals viewed from the rear side, with the scanner label upright, for 8 Channel & 16 Channel versions, respectively.

(1) Old Version

Figure 1.2(a) : 8 Channel

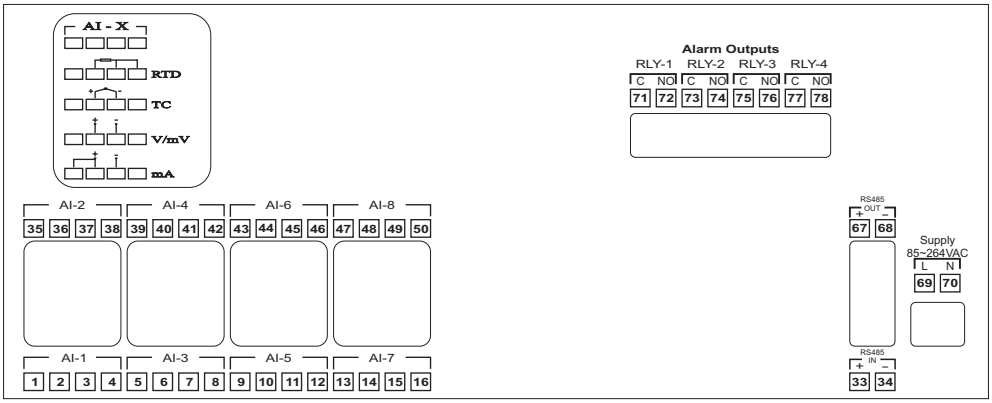
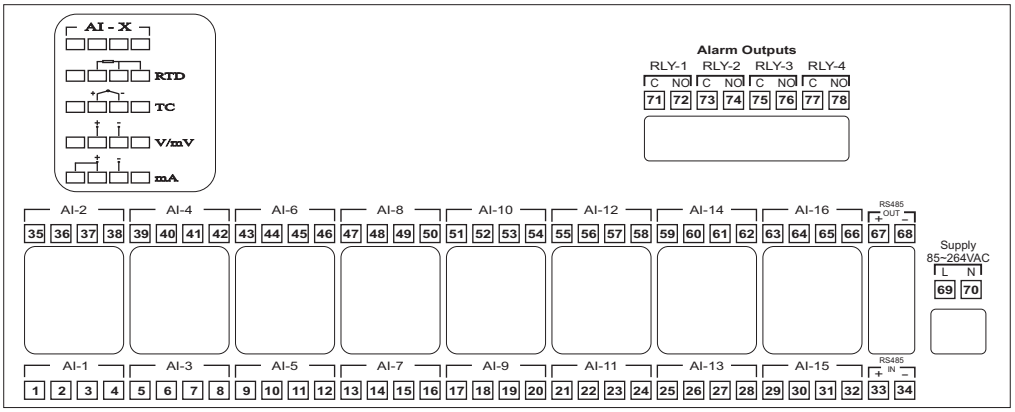


Figure 1.2(b) : 16 Channel



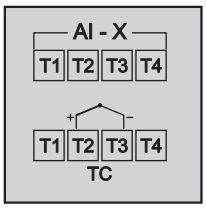
INPUT CHANNELS

All input channels are identical from wiring connection viewpoint. For explanation purpose, the 4 terminals pertaining to each channel have been marked as T1, T2 ,T3 & T4 in the following pages. The descriptions below apply to all the channels with no deviations.

Thermocouple

Connect Thermocouple Positive (+) to terminal T2 and Negative (-) to terminal T3 as shown in **Figure 1.3(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 1.3(a)

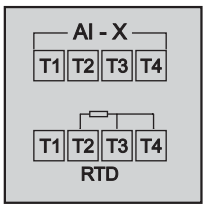


RTD Pt100 (3-wire or 2-wire)

For 3-wire configuration, connect single leaded end of **RTD** bulb to terminal T2 and the double leaded ends to terminals T3 and T4 (interchangeable) as shown in **Figure 1.3(b).** 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.

For 2-wire configuration, connect the 2 sensor wires to terminal T2 and T3 (interchangeable). Also **short** terminals T3 & T4.

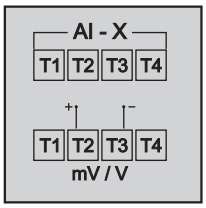
Figure 1.3(b)



DC Linear Voltage (mV / V)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mV / V source. Connect common (-) to terminal T3 and the signal (+) to terminal T2, as shown in **Figure 1.3(c).**

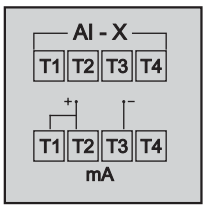
Figure 1.3(c)



DC Linear Current (mA)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA source. Connect common (-) to terminal T3 and the signal (+) to terminal T2. Also **short** terminals T1 & T2. Refer **Figure 1.3(d).**

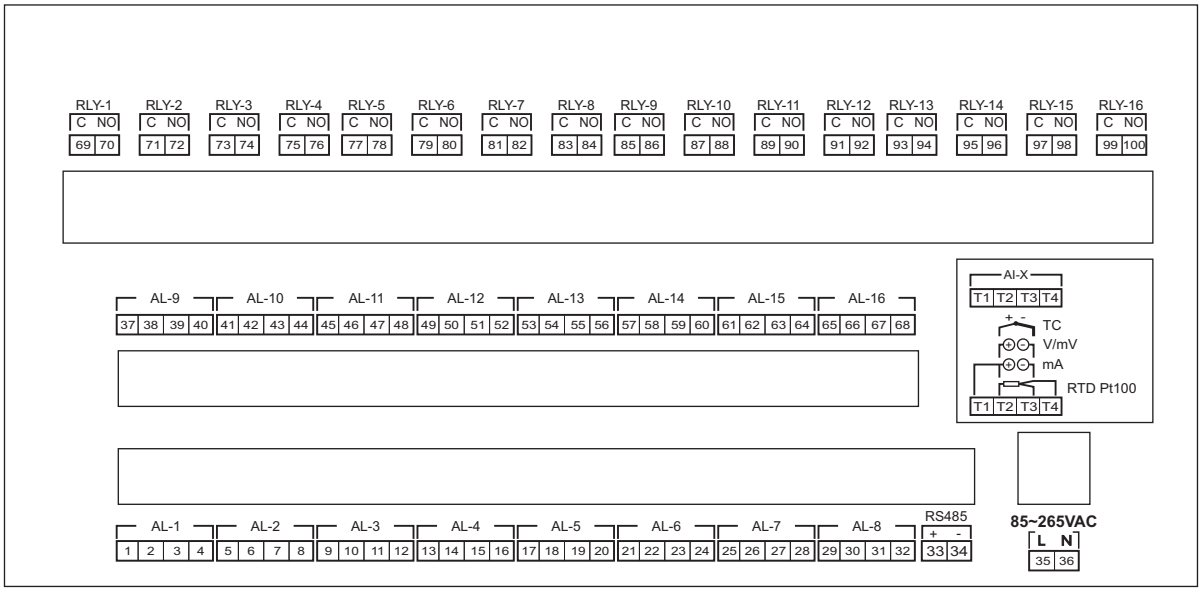
Figure 1.3(d)



The Figure 1.4 shows the **New** terminals viewed from the rear side, with the scanner label upright.

(2) New Version

Figure 1.4



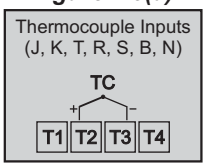
INPUT CHANNELS

Each of the 4/8/12 or 16 input channels are identical from wiring connection viewpoint. The 4 terminals are marked in below description as T1, T2, T3 & T4. The descriptions below apply to all the channels with no deviations.

Thermocouple

Connect Thermocouple Positive (+) to terminal T2 and Negative (-) to terminal T3 as shown in ***Figure 1.5(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.

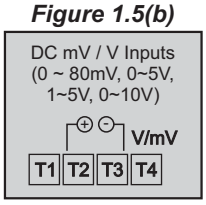
Figure 1.5(a)



DC Linear Voltage (mV / V)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mV / V source. Connect common (-) to terminal T3 and the signal (+) to terminal T2, as shown in **Figure 1.5(b).**

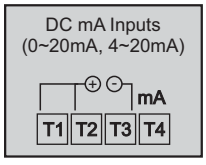
Figure 1.5(b)



DC Linear Current (mA)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA source. Connect common (-) to terminal T3 and the signal (+) to terminal T2. Also **short** terminals T1 & T2. Refer **Figure 1.5(c).**

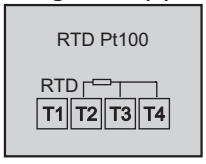
Figure 1.5(c)



RTD Pt100, 3-wire

Connect single leaded end of **RTD** bulb to terminal T2 and the double leaded ends to terminals T3 and T4 (interchangeable) as shown in **Figure 1.5(d).** 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.

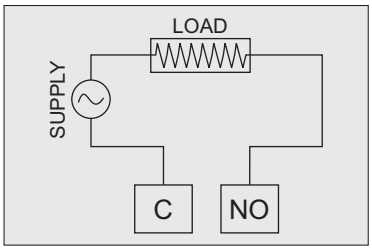
Figure 1.5(d)



OUTPUTS

There are up to 16 Relay Outputs provided. The relay connections are shown in Figure 1.6 below.

Figure 1.6

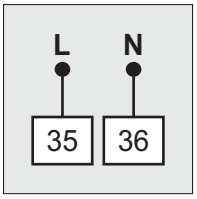


Relay

Potential-free Relay changeover contacts NO (Normally Open) and C (Common) rated 10A/240VAC (resistive load) are provided as Relay output.

POWER SUPPLY

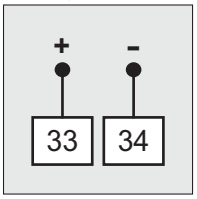
Figure 1.7



The instrument accepts single phase, 50/60 Hz Line Voltage ranging from 85 to 264 VAC. Use well-insulated copper conductor wire of the size not smaller than 0.5 mm² for power supply connections. Connect Line (Phase) supply line to terminal marked 'L' and Neutral (Return) supply line to terminal marked 'N' as shown in Figure1.7

SERIAL COMMUNICATION PORT

Figure 1.8



Connect terminal (+) and (-) of the Instrument to the positive (+) and negative (-) terminal of the master device.

Note

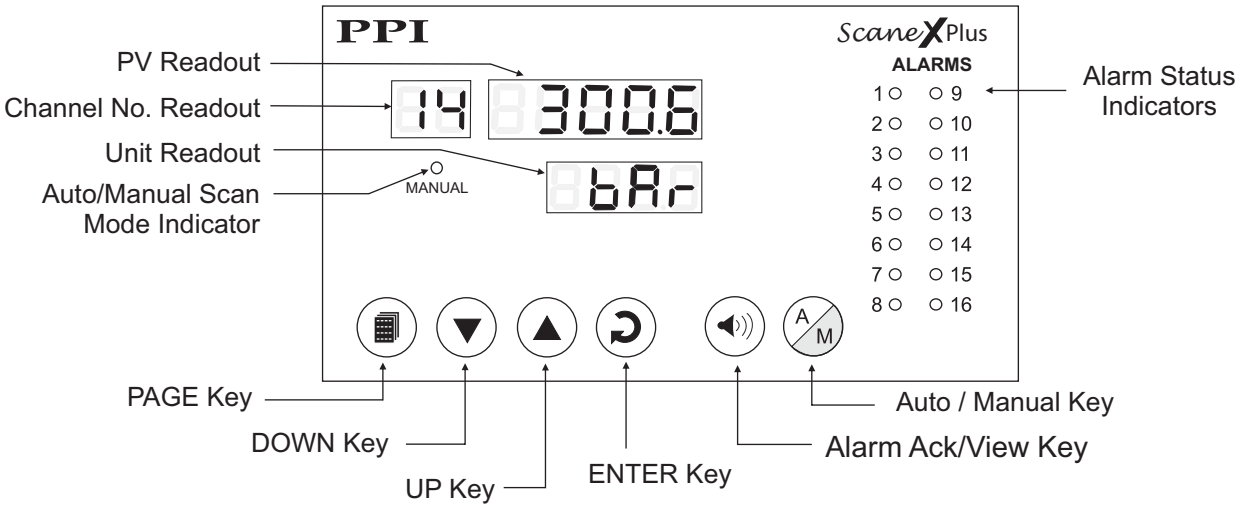
PC as a master device cannot be connected (wired) directly to the instrument as PC is equipped with RS232 serial port which is not directly compatible with RS485 port on Instrument side. In such cases use RS232 / RS485 converter as a bridge.

Section 2

FRONT PANEL LAYOUT

The front panel comprises of digital readouts, LED indicators and membrane keys as shown in Figure 2.1 below.

Figure 2.1



READOUTS

The PV Readout is a 5 digit, 7-segment bright red LED display that displays the PV (Process Value). In Set-up Mode, the PV Readout displays parameter values/options.

The Channel No. Readout is a 2 digit, 7-segment bright red LED display that shows the Channel No. for which the PV Readout shows the PV. In Set-up Mode, the Channel No. Readout remains blank.

The Unit Readout is a 4 digit, 7-segment bright green LED display and usually displays the 'Unit' pertaining to the PV Readout. In Set-up Mode, the Unit Readout displays parameter name (prompts).

INDICATORS

There is a single 3 mm red LED indicator that shows the Auto/Manual Scan Mode Status. A group of 16 red LEDs show the Alarm Status for each of 16 channels. Refer table 2.1 below.

Table 2.1

Indicator	Function
MANUAL	Glows ON when the Scanner is put in Manual Scan Mode.
ALARMS (1 to 16)	Flashes if the corresponding channel is in Alarm condition.

KEYS

There are six tactile keys provided on the front panel for setting-up the parameter values and for other functions & commands. The Table 2.2 below lists each key and the associated function.

Table 2.2

Symbol	Key	Function
	PAGE	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	Press to store the set parameter value and to scroll to the next parameter.
	Alarm Ack/View	Press to Acknowledge any pending Alarm(s) and to View details of the channels under Alarm.
	Auto / Manual	Press to toggle between Auto and Manual Scan Mode. In Manual Scan Mode, Use UP / DOWN keys to the desired channel.

Section 3

BASIC OPERATION

POWER-UP

Upon switching on the power to the unit, all displays and indicators are lit on for approximately 3 seconds during which time the Scanner runs a self initialization sequence.

MAIN DISPLAY MODE

After the self initialization sequence, the Scanner enters MAIN Display Mode. The PV Readout starts showing the measured PV (Process value) with the corresponding channel number being shown on the Channel No. Readout. The MAIN Display Mode is one that shall be used most often.

The Scanner may be configured to operate in either Auto or Manual Scan Mode. The Power-on default mode is 'Auto Scan Mode'. Use front panel key 'A/M' to toggle between the Auto and Manual Scan Mode.

Auto Scan Mode

In this mode, the Scanner shows the Process Value for each channel sequentially at a periodic interval, called 'Scan Rate'. The Scan Rate is user settable from 1 to 99 seconds. The channels are displayed in ascending (increasing) order with the last channel automatically rolling over to the first channel. In Auto Scan Mode, the front indicator marked 'MANUAL' remains OFF.

Manual Scan Mode

In this mode, the Scanner keeps displaying the Process Value for the selected channel indefinitely. The user can switch to and hold any desired channel by using UP/DOWN keys. In Manual Scan Mode, the front indicator marked 'MANUAL' is lit ON.

ALARM SYSTEM

There are up to 4 soft Alarms (AL-1 to AL-4) available for each channel.

Status Indication

There are 16 front panel Alarm Status LEDs, one for each channel. If any one or more set Alarm for a channel is active, the corresponding front panel indicator flashes.

Relay Activation & Acknowledge

The 4 Relay Outputs (RLY-1 to RLY-4) are mapped with the 4 Alarms (AL-1 to AL-4) as explained below in Table 3.1.

Table 3.1

Output	Associated Alarm	Relay Activation
RLY-1	AL-1	If Alarm-1 for any one or more channels is ON
RLY-2	AL-2	If Alarm-2 for any one or more channels is ON
RLY-3	AL-3	If Alarm-3 for any one or more channels is ON
RLY-4	AL-4	If Alarm-4 for any one or more channels is ON

The front panel Alarm Ack/View key is used to mute the *Audio Alarm* or to bring the system out of *Trip Condition*. The effect of acknowledge function depends both on the Relay Logic (Direct / Reverse) and Latched / Un-Latched operation. Note that Acknowledging the alarm only de-activates the relay output and does not remove the Alarm condition. Refer Table 3.2 for effect of Acknowledge Key.

Table 3.2

Relay Logic	Latched	Effect of Acknowledge Key
Direct (Alarm)	No	Switches OFF the Alarm output
Reverse (Trip)	No	No effect
Direct (Alarm)	Yes	Switches OFF the Alarm output provided no Alarm condition is pending
Reverse (Trip)	Yes	Switches ON the Trip relay (brings out of tripping) provided no Alarm condition is pending

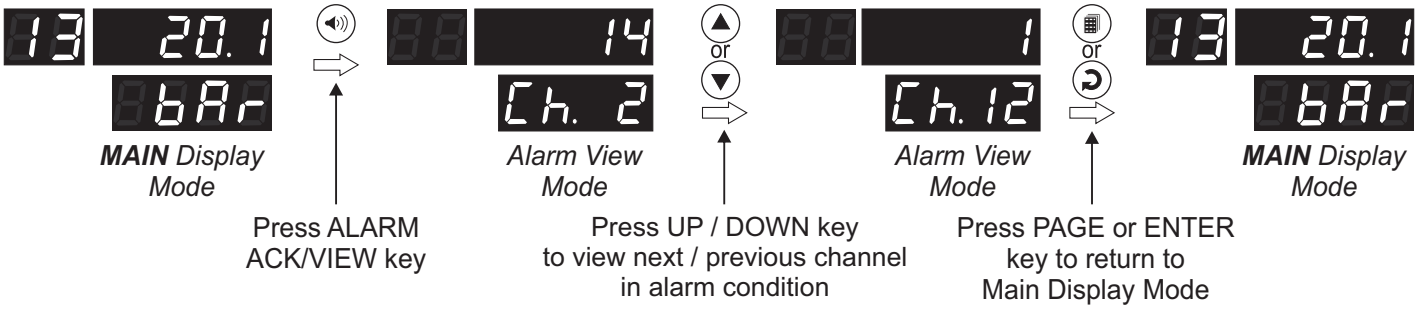
Detail Alarm View

Pressing the Alarm Ack/View key also provides complete Alarm status information for the channels under alarm condition. The Unit Readout indicates the 'Channel Number' under Alarm and the corresponding 'Alarm Number(s)' are indicated on the PV Readout. The UP/DOWN keys can be used to scroll through all the channels under Alarm.

The example Figure 3.1 below illustrates the case : Channel-2 and Channel-12 are currently under Alarm condition. The active Alarms for Channel-2 are Alarm-1 and Alarm-4 while for Channel-12 it is only Alarm1.

Note : Pressing the Alarm Ack/View key has no effect if none of the channels is under Alarm condition.

Figure 3.1



PV ERROR INDICATION

In case the PV falls below the Minimum Range or rises above the Maximum Range specified for the selected 'Input Type' or in case the input sensor is open / broken; the PV Readout flashes the error messages listed in Table 3.3 below. The Figure 3.2 illustrates an open sensor condition for channel-14, for example.

Figure 3.2

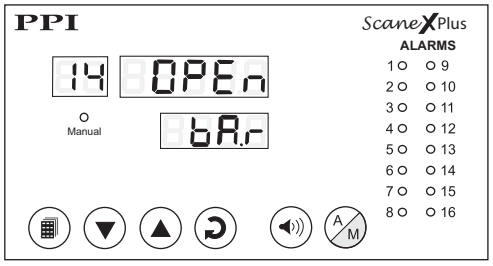


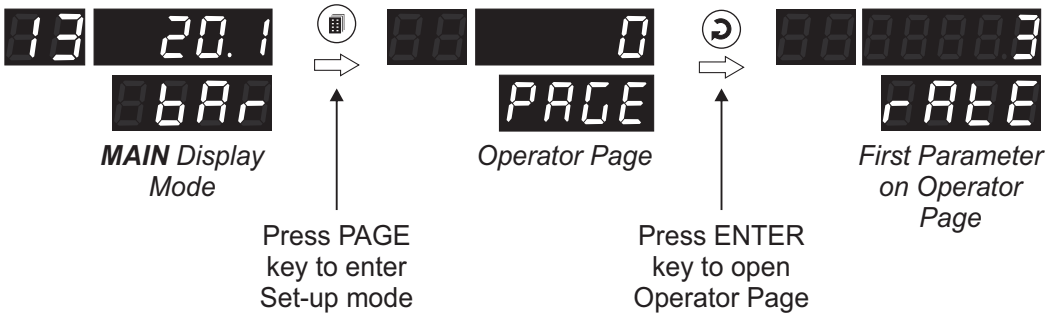
Table 3.3

Message	PV Error Type
Or	Over-range (PV above Max. Range)
Ur	Under-range (PV below Min. Range)
OPEn	Open (Sensor open / broken)

OPERATOR PAGE & PARAMETERS

The Operator page contains the parameters that are used most frequently and the commands that are required for day-to-day operation. This page is not locked for editing by Master Lock. The Figure 3.2 below illustrates how to access Operator Page (Page 0).

Figure 3.2



The Operator Page parameters are listed in Table 3.4 below.

Table 3.4

Parameter Description	Settings (Default Value)
SCAN RATE rAtE Applicable for Auto Scan Mode only. 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.)
RESET COMMAND rSt This feature clears the current Min/Max values of all Channels and starts afresh monitoring the channels for new highest and lowest values. For resetting, set the reset command to 'Yes'.	no No YES Yes (Default : No)
CHANNEL NUMBER CHAn Select the channel no. whose Min/Max PV is to be viewed. This Parameter reappears cyclically after viewing Max/Min Values for each selected channel number.	1 to Actual no. of Channels to Scan (Default : 1)
MAXIMUM PV Hi The maximum PV attained by the selected channel.	View Only (Default : NA)
MINIMUM PV Lo The minimum PV attained by the selected channel.	View Only (Default : NA)

Section 4

SET UP MODE : ACCESS AND OPERATION

There are many user settings that determine how the instrument will function or operate. These setting are called Parameters.

For the convenience and ease of operation, the various parameters have been grouped separately depending upon the functions they define. Each such group is called a PAGE. Each PAGE is assigned a unique number, called PAGE NUMBER, for its access. The parameters contained in a PAGE are presented in a fixed sequence to the user for setting. The user can access a desired PAGE by entering its PAGE NUMBER and can select and set the desired parameter values.

PARAMETER PROMPTS

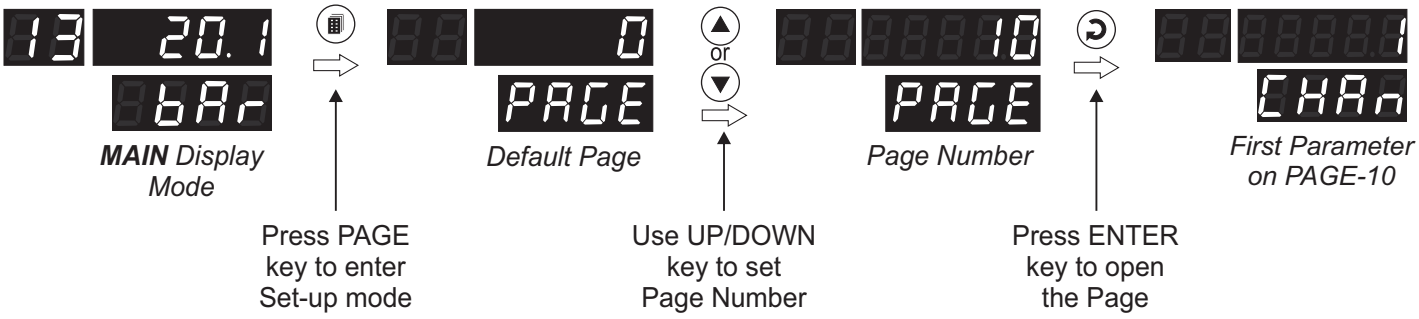
Each parameter has an identifying tag, called the Parameter Prompt. While setting parameter values in a PAGE, the parameter prompt is always displayed on the Unit Readout and its current value is displayed on the PV Readout.

ACCESSING A PAGE

Each PAGE is accessible only from the MAIN Display Mode. That is, from the current PAGE, the user must return to the MAIN Display Mode before the other PAGE can be accessed.

Figure 4.1 illustrates access to the desired PAGE from MAIN Display Mode.

Figure 4.1

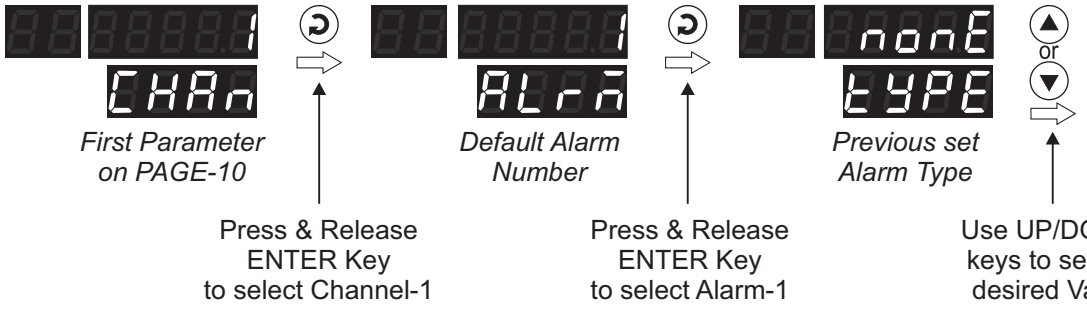


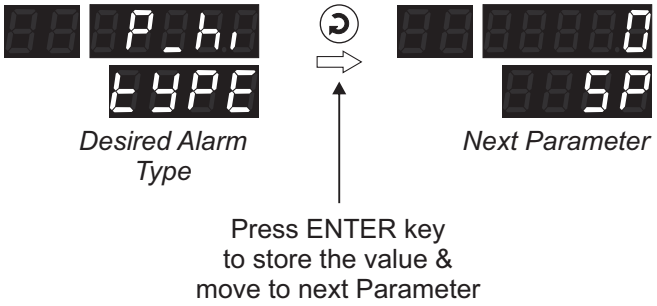
ADJUSTING PARAMETER VALUES

For accessing and adjusting the parameter, one must first open the PAGE containing the parameter.

Figure 4.2 illustrates how to access the desired parameter(s) and adjust the corresponding value(s). The illustration shows accessing the parameter ‘Alarm Type’ for Alarm-1 of Channel-1 and changing its value from ‘None’ to ‘Process High’. Press PAGE key to revert to MAIN Mode.

Figure 4.2

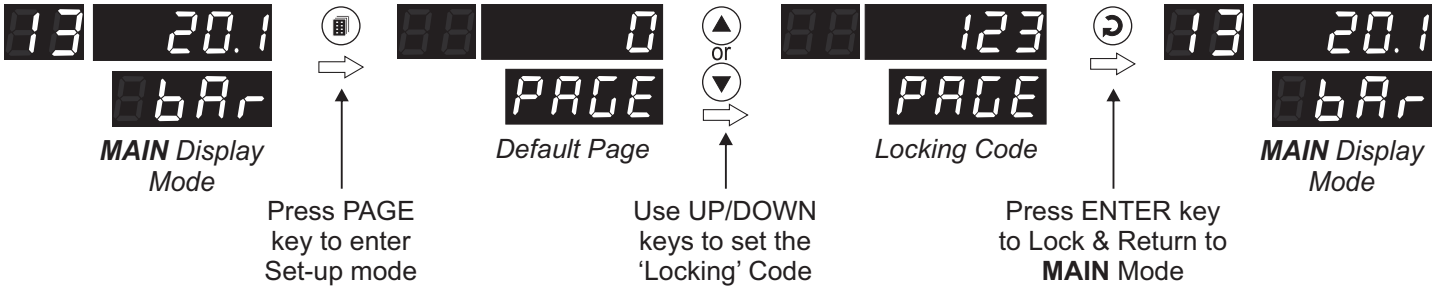




PARAMETER LOCKING

For protecting the parameter values from unauthorized / accidental alterations, the parameter adjustments can be Locked. The Operator Page is not affected by locking. The Figure 4.3 illustrates the steps for Locking.

Figure 4.3

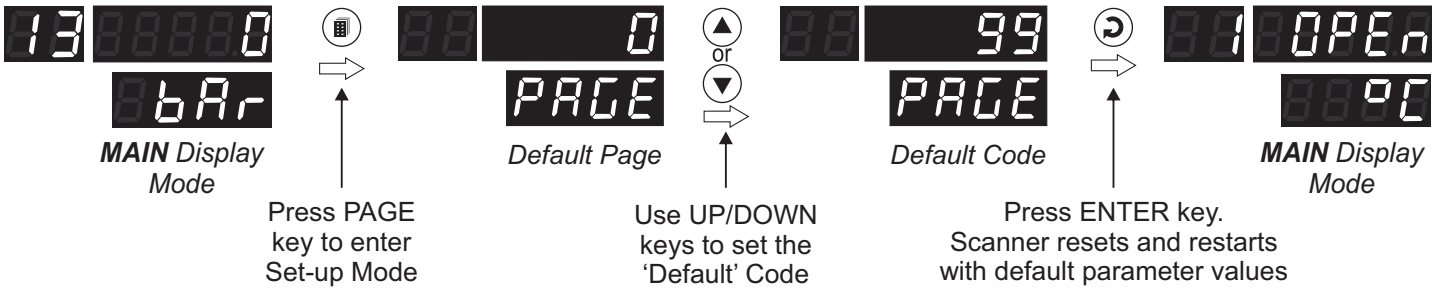


For **Un-Locking**, repeat the sequence of steps shown in Figure 4.3 twice.

SETTING DEFAULT VALUES

The instrument is shipped from the factory with all the parameters set to their default values. Refer Figure 4.4 below for regaining the factory default values.

Figure 4.4



Section 5

PAGE 12 : CONFIGURATION PARAMETERS

The configuration parameters are listed in Table 5.1 below and are generally required to be set only at the time of installation. Set these parameters appropriately based on the types of Thermocouple / Sensor connected and other application needs.

Table 5.1

Parameter Description	Settings (Default Value)
ACTUAL NUMBERS OF CHANNELS TO SCAN Sn.CH The numbers of channels actually connected/used for monitoring. This allows skipping unused channels for scanning. Note that only consecutive channels, starting from channel-1, must be used.	1 to Max. Available (Default : 8 or 16)
SENSOR-BREAK PV STATUS S.brP This parameter setting allows user to define the alarm behavior under Sensor open condition. *UP* : Any Alarm set as 'Process High' gets activated. *DOWN* : Any Alarm set as 'Process Low' gets activated.	UP Up Scale dn Down Scale (Default : Up Scale)
COMMON INPUT CONFIGURATIONS C.In.C In most applications the Scanner is used to monitor the process value at different points within a closed space (Chamber, Cold Room, etc). Thus the type of sensors and also the measurement resolution and units used are Identical (Common) for all channels. This parameter facilitates eliminating repetitive settings for multiple channels in such cases. *Yes* : The parameter values for Input type, Resolution and PV Units are applied to all the channels. *No* : The parameter values for Input type, Resolution and PV Units need to be set independently for each channel.	no No YES Yes (Default : Yes)
SELECT CHANNEL FOR CONFIGURATION CHAn Refer Figure 5.1 (a) and 5.1 (b).	1 to Actual no. of channels to scan (Default : 1)
INPUT TYPE inPt Refer Table 5.2. Select the Input Type in accordance with the type of sensor connected to the selected channel.	Refer Table 5.2 (Default : Type K)
RESOLUTION rSLn Set the process value indication resolution (decimal point). All the resolution based parameters (Alarm setpoint, hysteresis etc.) then follow this resolution setting.	Refer Table 5.2 (Default : 0.1)

<table>
<tr><th>Parameter Description</th><th>Settings
(Default Value)</th></tr>
<tr><td>PV UNITS Unit

Select Temperature units in °C or °F for Thermocouple or Pt100 sensor.

For DC Linear input (mA/mV/V), Select appropriate Units from the list in Table 5.3. Note however that the selected Units are for the purpose of indication on Lower Readout only.</td><td>Refer Table 5.3
(Default : °C)</td></tr>
<tr><td>SIGNAL LOW SGLo

(Applicable only for DC Linear Inputs)

The transmitter output signal value corresponding to Range Low process value. For more Description Refer Appendix-A.</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 SGHi

(Applicable only for DC Linear Inputs)

The transmitter output signal value corresponding to Range High process value. For more Description Refer Appendix-A.</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>
<tr><td>DC RANGE LOW rLo

(Applicable only for DC Linear Inputs)

The process value corresponding to the Signal Low value from the transmitter. For more Description Refer Appendix-A.</td><td>-1999.9 to 3000.0
(Default : 0.0)</td></tr>
<tr><td>DC RANGE HIGH rHi

(Applicable only for DC Linear Inputs)

The process value corresponding to the Signal High value from the transmitter. For more Description Refer Appendix-A.</td><td>-1999.9 to 3000.0
(Default : 100.0)</td></tr>
<tr><td>BOTTOM CLIPPING ENABLE bCE

(Applicable only for DC Linear Inputs)

Refer Appendix-B.</td><td>dSbL Disable
EnbL Enable
(Default : Disable)</td></tr>
<tr><td>BOTTOM CLIPPING bCLP

(Applicable only for DC Linear Inputs)

Refer Appendix-B.</td><td>-1999.9 to Top Clipping
Default: 0.0</td></tr>
</table>

Parameter Description	Settings (Default Value)
TOP CLIPPING ENABLE tCE *(Applicable only for DC Linear Inputs)* Refer Appendix-B.	dSbL Disable EnbL Enable (Default : Disable)
TOP CLIPPING t.CLP *(Applicable only for DC Linear Inputs)* Refer Appendix-B.	Bottom Clipping to 3000.0 (Default : 100.0)
OFFSET OFSt 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 compensate known thermal gradient. This parameter is used to remove such errors. Actual (Displayed) PV = Measured PV + Offset for PV.	-1999.9 to 3000.0 (Default : 0.0)

Table 5.2

Option	What it means	Range (Min. to Max.)	Resolution
tC_J	Type J Thermocouple	0.0 to +960.0°C / +32.0 to +1760.0°F	1 °C/°F or 0.1 °C/°F
tC_K	Type K Thermocouple	-200.0 to +1376.0°C / -328.0 to +2508.0°F	
tC_t	Type T Thermocouple	-200.0 to +387.0°C / -328.0 to +728.0°F	
tC_r	Type R Thermocouple	0.0 to +1771.0°C / +32.0 to +3219.0°F	
tC_S	Type S Thermocouple	0.0 to +1768.0°C / +32.0 to +3214.0°F	
tC_b	Type B Thermocouple	0.0 to +1826.0°C / +32.0 to +3218.0°F	
tC_n	Type N Thermocouple	0.0 to +1314.0°C / +32.0 to +2397.0°F	
rESu	Reserved for customer specific Thermocouple type not listed above. The type shall be specified in accordance with the ordered (optional on request) Thermocouple type.		
rtd	3-wire, RTD Pt100	-199 to +600°C / -328 to +1112°F **or** -199.9 to +600.0°C / -328.0 to +1112.0°F	1 °C/°F or 0.1 °C/°F

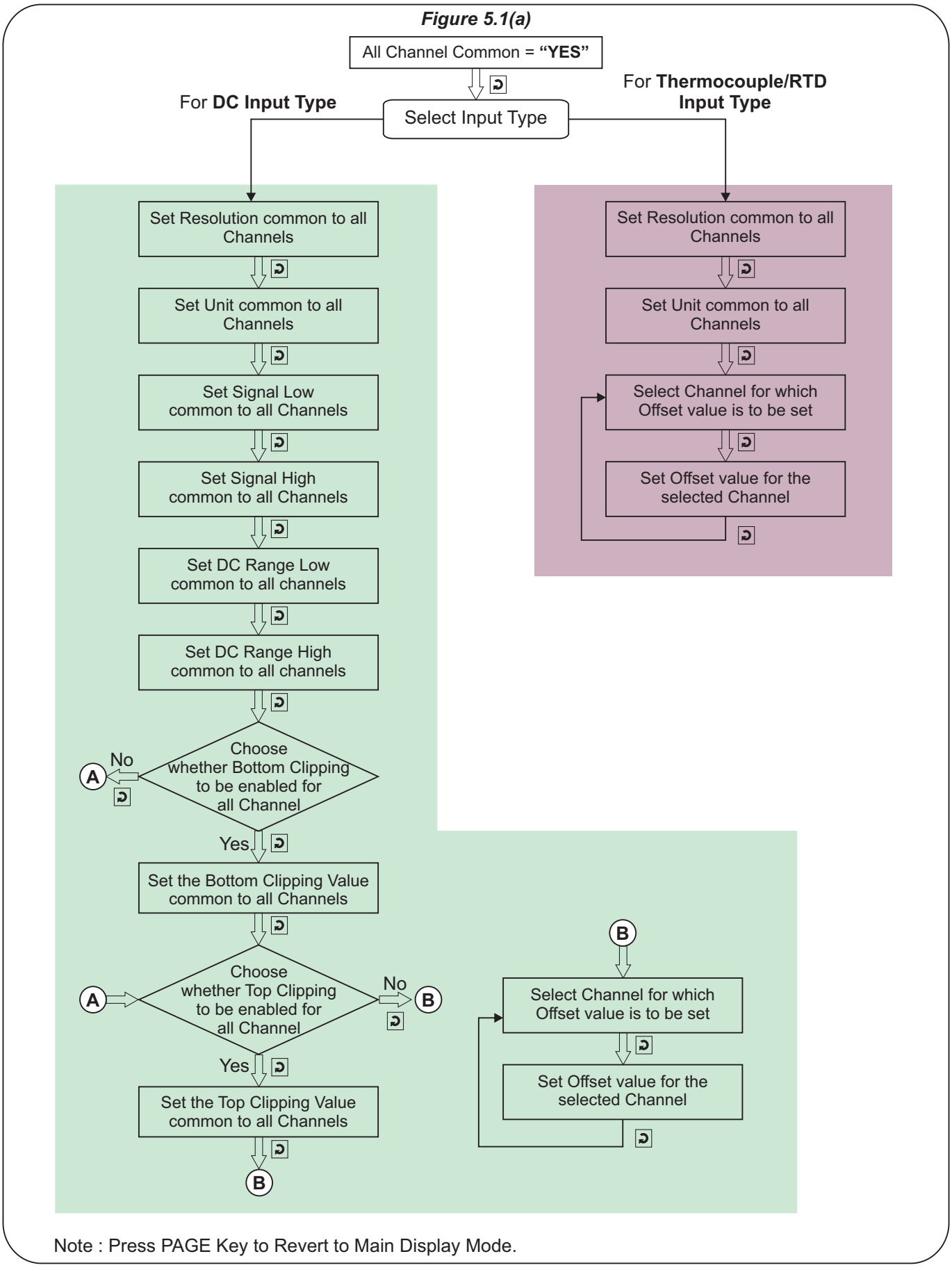
Option	What it means	Range (Min. to Max.)	Resolution
0-20	0 to 20mA DC current	-19999 to 30000 units	1 0.1 0.01 0.001 units
4-20	4 to 20mA DC current		
0.080	0 to 80mV DC voltage		
rESu	Reserved		
1.25	0 to 1.25V DC voltage		
5.0	0 to 5.0V DC voltage		
10.0	0 to 10.0V DC voltage		
1-5	1 to 5.0V DC voltage		

Table 5.3

Unit Readout	Units
°C	°C
°F	°F
°K	Kelvin
EU	Engineering Units
PErc	Percentage
PAS	Pascals
mPAS	Mpascals
KPAS	Kpascals
bAr	Bar
mbAr	Milli bar
PSI	PSI
KGcm	kg/sq cm
mmWG	mm water gauge
inWG	Inches water gauge
mmHG	mm mercury
torr	Torr

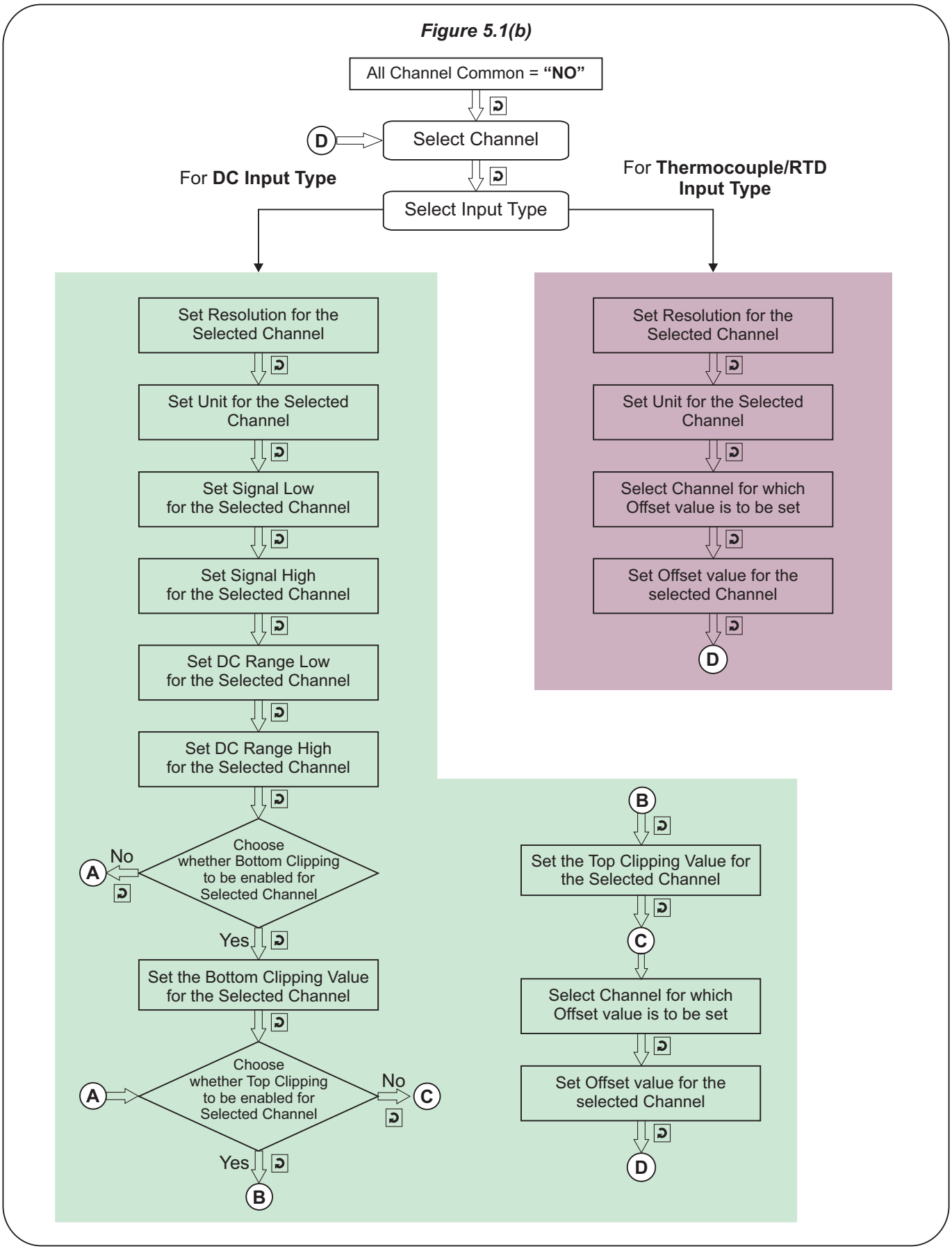
Unit Readout	Units
L-H	Liters per hour
L-n	Liters per minute
P.rh	% Relative Humidity
P.O2	% O_2
P.CO2	% CO_2
P.CP	% Carbon Potential
volt	volts
AnP	Amps
nA	Milli amps
nu	Milli Volts
Ohn	Ohms
PPn	Parts per million
rPn	Revolutions per pinute
n-S	Milli seconds
SEC	Seconds
ni n	Minutes
hrS	Hours
PH	PH
P.PH	%PH
nPH	Miles per hour
nG	Milli grams
GrAn	Grams
KG	Kilo grams

Figure 5.1(a)



Note : Press PAGE Key to Revert to Main Display Mode.

Figure 5.1(b)


All Channel Common = "NO"
D
Select Channel
For DC Input Type
For Thermocouple/RTD Input Type
Select Input Type
Set Resolution for the Selected Channel
Set Unit for the Selected Channel
Set Signal Low for the Selected Channel
Set Signal High for the Selected Channel
Set DC Range Low for the Selected Channel
Set DC Range High for the Selected Channel
Choose whether Bottom Clipping to be enabled for Selected Channel
No
A
Yes
Set the Bottom Clipping Value for the Selected Channel
Choose whether Top Clipping to be enabled for Selected Channel
No
C
Yes
B
Set Resolution for the Selected Channel
Set Unit for the Selected Channel
Select Channel for which Offset value is to be set
Set Offset value for the selected Channel
D
B
Set the Top Clipping Value for the Selected Channel
C
Select Channel for which Offset value is to be set
Set Offset value for the selected Channel
D

Section 6

PAGE 11 : ALARM CONFIGURATION PARAMETERS

The parameters presented on this page allow configuring the number of Alarms per channel, the Alarm output function (Audio / Visual or Tripping) and Alarm latching.

Table 6.1

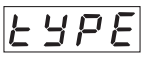
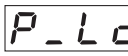
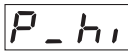
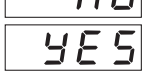
Parameter Description	Settings (Default Value)
NUMBER OF ALARMS PER CHANNEL AL.CH The instrument is provided with 4 independently settable soft Alarms per channel. However, the actual number of Alarms required per channel may vary from application to application. This parameter allows selecting the exact number of Alarms required per channel (Maximum 4).	1 to 4 (Default : 4)
SELECT OUTPUT RELAY NUMBER rLY The Scanner features 4 Relay Outputs (RLY-1 to RLY-4) that are mapped to AL-1 to AL-4 of each channel. The relay outputs can be used for either activating Audio/Visual gadgets (Normal Logic) or for Tripping the system being monitored (Reverse Logic). Further the output can be programmed to either switch ON/OFF with Alarm switching (Relay Latch = No) or remain Latched until acknowledged (Relay Latch = Yes). This parameter allows to select 1 out of 4 Relays for 'Logic' and 'Latch' parameter setting.	**For COMMON Relay Outputs** 1 to No. of Alarms per channel (Max. 4) **For INDIVIDUAL Relay Outputs** 1 to No. of Channels (Max. 16) (Default : NA)
RELAY LOGIC rLLG *Normal* : The Relay remains ON under Alarm condition; OFF otherwise. Useful for activating Audio (like hooter) or Visual (like lamp) gadget. *Reverse* : The Relay remains OFF under Alarm condition; ON otherwise. Useful for Tripping the system under monitoring.	norn Normal rEv Reverse (Default : Normal)
RELAY LATCH rLLt *No* : The Relay switches ON or OFF with Alarm activation or de-activation. *Yes* : The Relay Output switches (ON for Normal Logic / Off for Reverse logic) upon Alarm activation. However, Alarm de-activation does not affect the Relay status. The Relay status can only be regained by pressing acknowledge key provided the Alarm has de-activated.	no No YES Yes (Default : No)

Section 7

PAGE 10 : ALARM SETTING PARAMETERS

The Alarm setting parameters define how the alarm will function with respect to process value variations.

Table 7.1

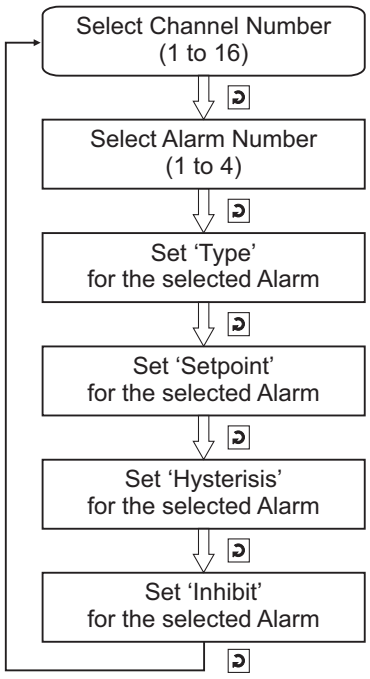
Parameter Description	Settings (Default Value)
CHANNEL NUMBER  Select the Channel Number for which the alarm parameters are to be set.	1 to Max. Channels (Default : NA)
ALARM NUMBER  Select the Alarm Number whose parameters are to be set.	1 to User Selected Alarm (Default : NA)
ALARM TYPE  *None* : Disable the 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)
ALARM SETPOINT  This parameter value sets the Process High or Process Low limit for Alarm.	Min. to Max. of selected input type range (Default : 0)
ALARM HYSTERISIS  This parameter value sets a differential (dead) band between the ON and OFF Alarm states. Keep it large enough to avoid frequent switching of the Alarm relay near setpoint.	0.1 to 3000.0 (Default : 2.0)
ALARM INHIBIT  *Yes* : The Alarm activation is suppressed until the **PV** is within Alarm limits from the time the Scanner is switched ON. This allows suppressing the Alarm during the start-up conditions. *No* : The Alarm is not suppressed during the start-up conditions.	 No  Yes (Default : No)

The Scanner may have up to 16 Channels and each Channel may have up to 4 Alarms. In order to set the Alarm parameters for a specific Alarm, the Alarm must first be identified by its number (1 to 4) and the Channel number (1 to 16) to which it belongs.

The parameters listed in this page include Channel number selection followed by Alarm number selection, followed by Alarm parameters.

Refer Figure 7.1 below for the navigation diagram.

Figure 7.1



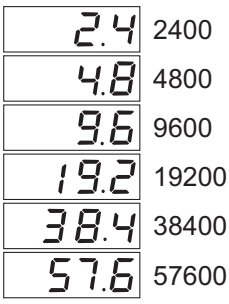
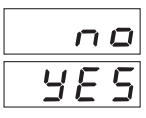
Note : Press PAGE Key to Revert to Main Mode.

Section 8

PAGE 13 : SUPERVISORY PARAMETERS

The Scanner incorporates utility feature like monitoring the channels for the highest / lowest PV and optionally serial communication port for interfacing with PC. The parameters for these features are listed on PAGE-13.

Table 8.1

Parameter Description	Settings (Default Value)
BAUD RATE  This parameter defines the communication speed expressed in "Bits per Second" (bps). The settable values are 2400, 4800, 9600, 19200, 38400 and 57600. The Baud Rate must be set to match the Baud rate set for the Master Device.	 2400 4800 9600 19200 38400 57600 (Default : 9600)
PARITY  This parameter is a part of communication protocol and helps detecting communication errors. The settable values are 'None', 'Even' and 'Odd'. The parity type must be set to match the parity type set for the Master Device.	 None Even Odd (Default : Even)
SERIAL ID  This parameter assigns an identification number for the communication with Master Device. The Master Device uses this ID to uniquely address the instrument for data transactions. The settable values are from 1 to 247.	1 to 247 (Default : 1)
SERIAL DELAY  Response Delay is the added turn around delay applied between message receipt by the Scanner and its response to the host. A fixed amount of delay is already present. Some host software or signal converters require added delay to work properly. If you fail to communicate with the module or have a high degree of communication errors, try increasing the response delay time.	0 to 90 mS In Steps of 10 mS (Default : 0 mS)
SERIAL WRITE PERMISSION  *Yes* : The Read/Write parameters can be accessed for both reading and writing. *No* : The Read/Write parameters can only be accessed for reading. That is the parameter values cannot be altered through serial communication.	 No Yes (Default : No)

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:

$$Y = mX + C$$

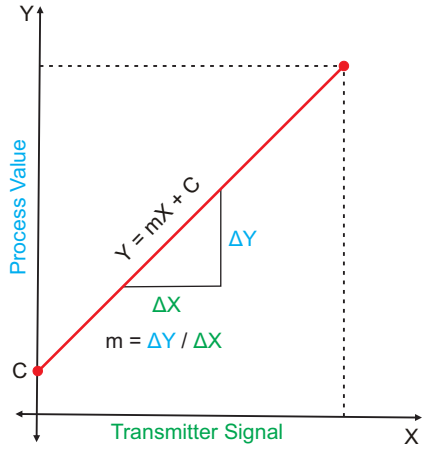
Where;

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.

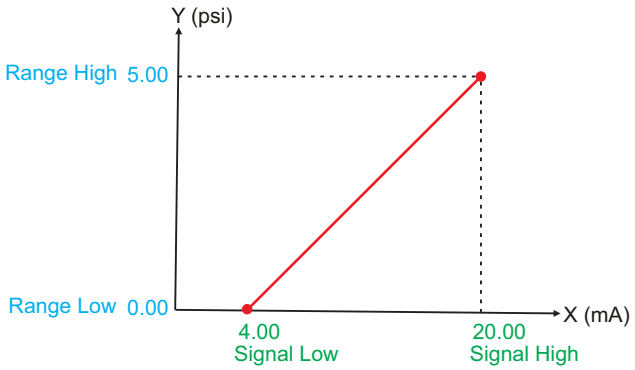
The linear transmitters usually specify two signal values (Signal Low and Signal High) and the corresponding Process Values (Range Low and Range High). In the example Pressure Transmitter above; the Signal Low, Signal High, Range Low & Range High values specified are: 4 mA, 20 mA, 0 psi & 5 psi, respectively.

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.

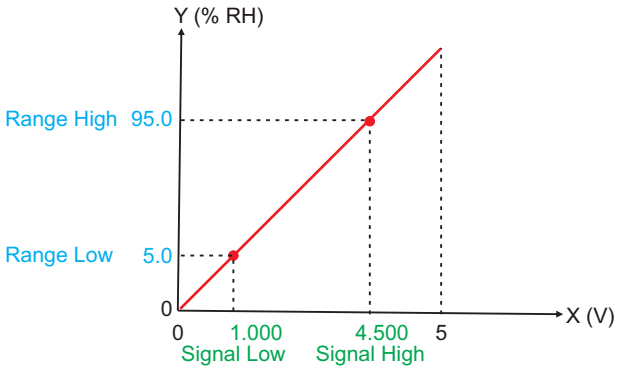
Example 1: Pressure Transmitter producing **4 to 20 mA** for **0 to 5 psi**



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

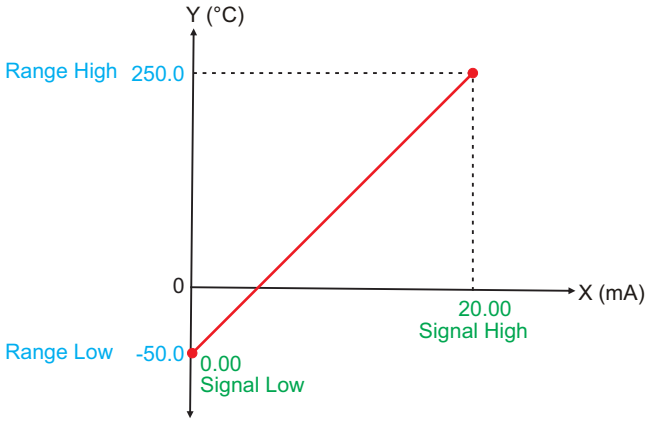
Example 2: Relative Humidity Transmitter producing **1 to 4.5 V** for **5 to 95 %RH**



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.

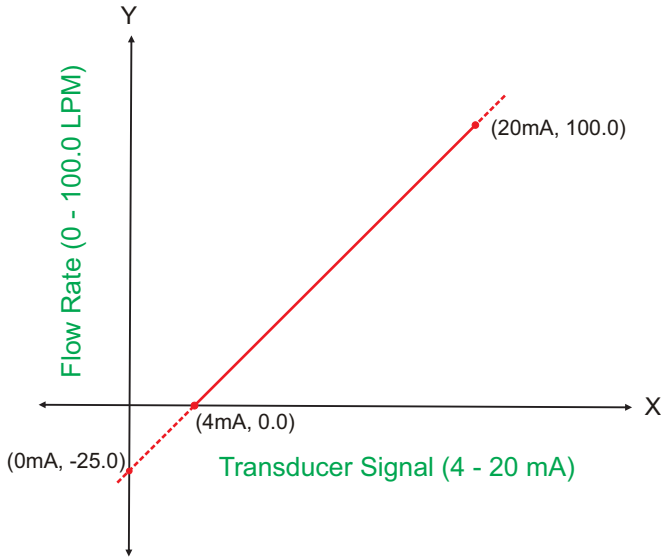
Input Type	:	0-20 mA
Signal Low	:	0.00 mA
Signal High	:	20.00 mA
PV Resolution	:	0.1
Range Low	:	-50.0
Range High	:	250.0

APPENDIX B
BOTTOM / TOP 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.

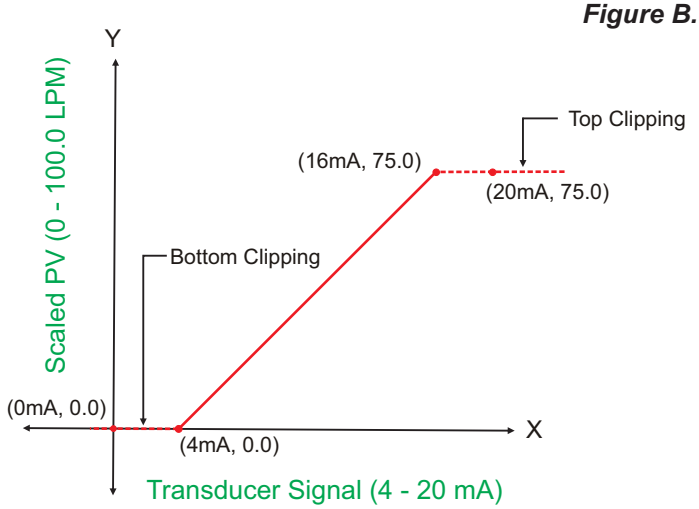
The Figure B.1 below illustrates an example of flow rate measurement using a transmitter / transducer producing a signal range of 4 - 20 mA corresponding to 0.0 to 100.0 Liters per Minute (LPM).

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 Bottom and/or Top 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 Bottom Clipping	: Yes
Bottom Clip Value	: 0.0
Enable Top Clipping	: Yes
Top Clip Value	: 75.0

PPI
The Perfection Experts

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