ScanLog
8C Printer Version

PPI
The Perfection Experts

8 Channel Universal Process Data Logger with USB Port for 80 / 132 Column Dot Matrix Printer Interface

PPI

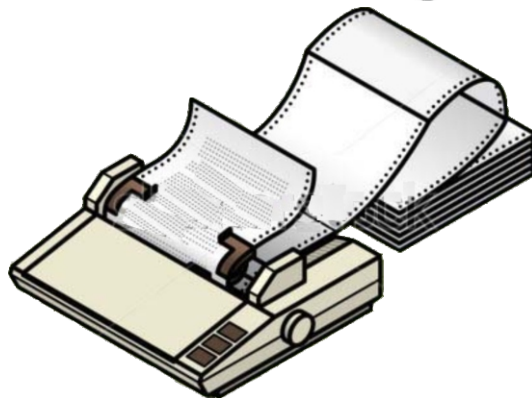09/01/17   12:40:06
1 250.6   5   1.66
2 248.1   6 15.621
3   203   7   18
4 121.3   8   -5.78

USB

ScanLog
8C Printer Version

Process Precision Instruments							
Unit - I, Vasai Road							
Test Laboratory Data							

Date DD/MM/YY	Time HH:MM:SS	Symbol	Ch-1	Ch-2	Ch-3	Ch-4	Ch-5	Ch-6	Ch-7	Ch-8
07/02/17	15:21:28	<	25.0	2.38	350	-19.6	25.0	2.38	350	-19.6
07/02/17	15:22:28		25.7	2.39	351	-19.4	25.7	2.39	351	-19.4
07/02/17	15:22:57	^	26.9	2.37	350	-19.0	26.9	2.37	350	-19.0

Checked By   QC-In-Charge

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User Manual

CONTENTS

Section 1

FRONT PANEL : LAYOUT AND OPERATION

The front panel comprises of 72x40 mm (160x80 pixels) Monochrome Graphic LCD Display, membrane keys & a slot for Printer and Pen Drive. Refer Figure 1.1 below.

Figure 1.1

Graphic Readout

USB Slot

Keys
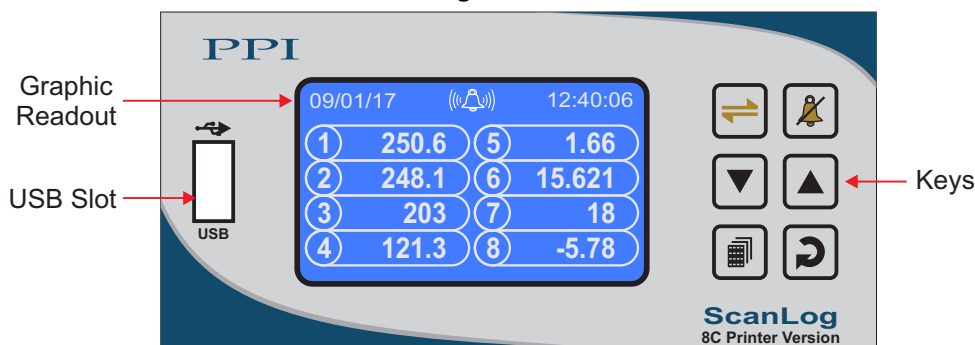
GRAPHIC READOUT

The Graphic Readout is a 80 X 160 Pixel Monochrome LCD Display. In Normal operation mode the Readout shows measured Process Values for All 8 Channels & currents Date/Time. Alarm Status screen can be viewed using 'Alarm Acknowledge' Key. The Scroll key can be used to view Channel Names, Recording Information & Stored Record.

In Set-up Mode, the Readout displays parameter names and values that can be edited using front keys.

KEYS

There are six tactile keys provided on the front panel for configuring the controller and setting-up the parameter values. The Table 1.1 below lists each key (identified by the front panel symbol) and the associated function.

Table 1.1

Symbol	Key	Function
⇄	Scroll	Press to scroll through various Process Information Screens in Normal Operation Mode.
🔔	Alarm Acknowledge	Press to acknowledge / mute alarm output (if active) & to view Alarm Status screen.
▼	DOWN	Press to decrease the parameter value. Pressing once decreases the value by one count; keeping pressed speeds up the change.
▲	UP	Press to increase the parameter value. Pressing once increases the value by one count; keeping pressed speeds up the change.
📑	SET-UP	Press to enter or exit set-up mode.
↩	ENTER	Press to store the set parameter value and to scroll to the next parameter.

Section 2
BASIC OPERATION

POWER-UP DISPLAY

Upon power-up the display shows the instrument's Model Name (ScanLog 8C Printer) and the Hardware & Firmware version (Version 1.0.1.0) for 4 seconds. During this time the instrument runs through a self-chack sequence. Refer Figure 2.1.

Figure 2.1

ScanLog
**8C Printer**
Version 1.0.1.0

RUN MODE

After the Power-up display sequence the instrument enters into RUN Mode. This is the normal operation mode wherein the instrument starts PV measurements, Alarm monitoring and Recording. The Display comprises of Main screen, Record Information screen & Record View screens described below. These screens appear one-after-the-other upon pressing Scroll key while in RUN Mode. The Alarm Status Screen is also available that can be viewed by pressing Alarm Acknowledge key.
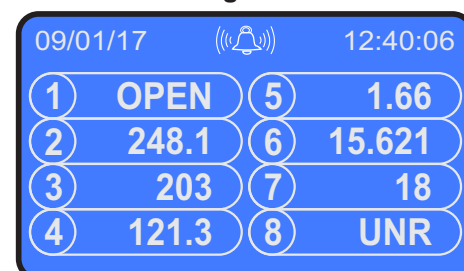
Main Screen

Figure 2.2
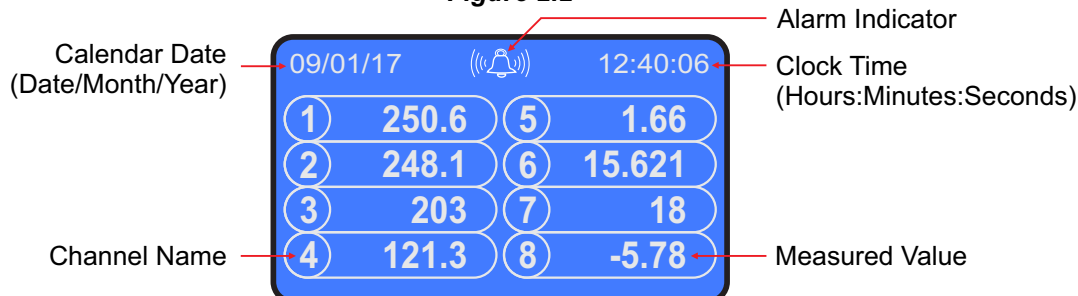
The Main Screen shows Channel Numbers (CH1, CH2, ...) along with corresponding Process Values, Calendar Date, Clock Time and Alarm indicator as illustrated in Figure 2.2 above. The Alarm Indicator appears only if any one or more alarms are active.

In case of measured value errors for Channels, the messages listed in Table 2.1 flash in place of process value as illustrated in Figure 2.3.

Table 2.1

Message	Error Type	Cause
OPEN	Sensor Open	RTD / Thermocouple Broken / Open
OVR	Over-range	Process Value above Max. Specified Range
UNR	Under-range	Process Value below Min. Specified Range

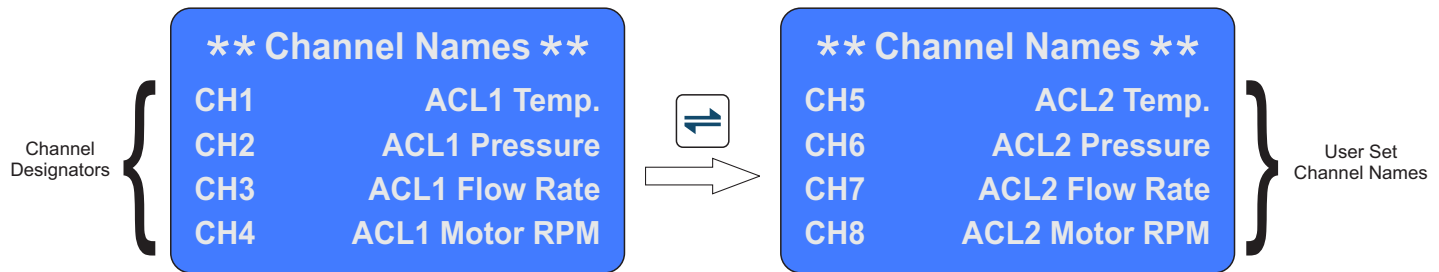**Figure 2.3**

Channel Names Screen

This screen is shown upon pressing ⇄ (Scroll) key from Main screen. This screen shows the user set Channel Names mapped against the designators CH1 for Channel 1, CH2 for Channel 2 and so on. Refer figure 2.4 for example screen.

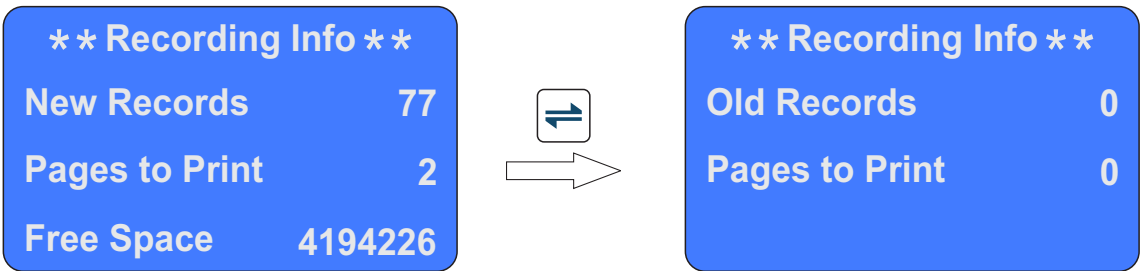*Figure 2.4*

Recording Information Screen

The recording information is shown upon pressing ⇄ (Scroll) key from Channel Names screen. The information is split in two screens; for New Records & Old Records. The transition from the first screen to the second screen is through scroll key as shown in figure 2.5 below.

Figure 2.5

Record View Screen

This screen is shown upon pressing ⇄ (Scroll) key from Recording Information screen. This screen facilitates viewing the stored New Records. The records can be scrolled for viewing using ▲ (UP) & ▼ (DOWN) keys. As depicted in Figure 2.6; the record view screen shows one record at a time (along with Record Number) that comprises Process Value & Alarm Status for Each Channel duly date / time stamped. Upon pressing the UP key while showing the last stored record, the first record is shown. Similarly upon pressing the DOWN key while showing the first stored record, the last record is shown.

Figure 2.6
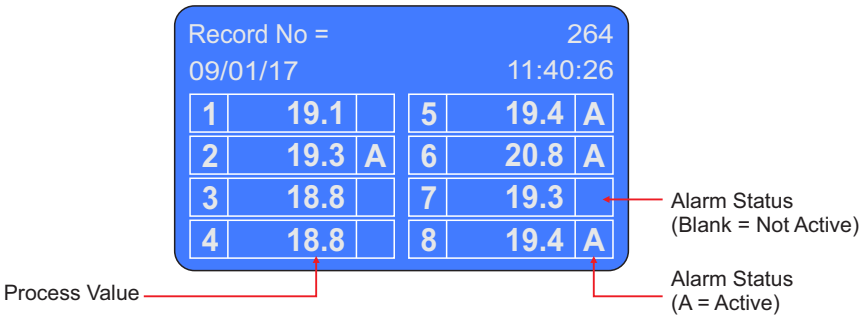
Alarm Status Screen

This screen is shown upon pressing 🔔 (Alarm Acknowledge) key from Run Mode screen. This screen shows the alarm status for all 4 alarms (AL1 to AL4) for each channel (CH1 to CH8). The ✓ symbol means active alarm.

Figure 2.7

Channel Numbers

Section 3
PRINTER INTERFACE & OPERATION

The front panel USB port on ScanLog supports 80 / 132 column Dot Matrix Printer Interface & Pen Drive Interface. The Printer interface is used for printing out the stored records. The Pen Drive interface is used for reading the files that facilitate :

1. Assigning user defined names to each input channel.
2. Setting Page Header.
3. Setting Page Footer.

PRINTER INTERFACE
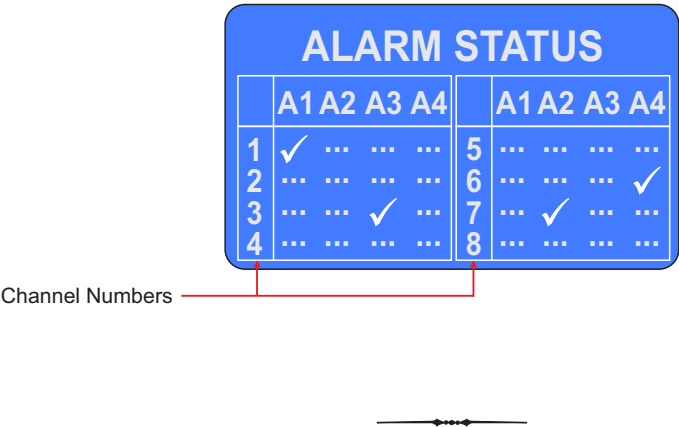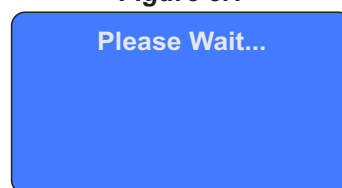
Upon inserting the Printer cable into the USB port, the ScanLog responds by displaying the message shown in the figure 3.1 provided the printer is attached and powered. The message may be displayed for a very brief period.

Figure 3.1

Please Wait...

The ScanLog then presents one or more of the following options for the next operation:

> None
> Print (New)
> Re-Print (Old)
> Resume
> Recover
> Print Info Page

The above option list is presented one option at a time. Use UP / DOWN keys to view the options & then press ENTER key to select the desired option. Select option '**None**' to revert to RUN mode screen.

❖ *'Print (New)' Option*

This option is presented only if there are new records available in the internal memory and if the 'Resume' & 'Recover' options are not presented. This option prints the records that are not yet printed even once, that is, "new" records. After successfully printing the "new" records, the ScanLog retains this set of records as "old" records until next successful 'Print (New)' operation is executed.

❖ *'Re-Print (Old)' Option*

This option is presented only if there are old records available in the internal memory and if the 'Resume' & 'Recover' options are not presented. This option prints the set of records that were successfully printed during last 'Print (New)' operation and thus retained as "old" records. This feature allows re-gaining the records in case the previously printed records were lost inadvertently.

❖ *'Resume' & 'Recover' Options*

These options are presented only if a previous **Print (New)** or **Re-Print (Old)** operation was interrupted due to 'Paper Out' or 'Printer Fault'.

The **Resume** operation uses an additional parameter 'OFFSET RECORDS' available under Operator Parameter List (Refer Section 4 : OPERATOR PARAMETERS). Upon selecting this option the ScanLog resumes printing from the record number

that was last sent to the printer for printing minus the value set for the parameter 'OFFSET RECORDS'. For example suppose there were 100 records for printing at the time of issuing the print command and the printing operation was interrupted after printing 60 records. The printing would then resume from 50th record if the value for the parameter 'OFFSET RECORDS' is 10. The 'OFFSET RECORDS' accounts for the records that may have been sent to the printer memory but could not be printed.

The **Recover** operation re-prints from the first record that was printed upon issuing the print command. That is, in the above example, all 100 records will be printed regardless of how many records were printed prior to interruption.

❖ *'Print Info Page' Option*

The ScanLog generates records at user set periodic interval and upon occurrence of specific events like Power-up, RTC Change, Alarm Toggle, etc. The event based records are printed with special symbols to differentiate from periodic records. These symbols are printed in the 3rd column (after Date & Time). Note that a record may contain multiple symbols to imply occurrence of more than one events at the same time. The '**Print Info Page**' option gives a single page print out that lists the symbols along with the meanings and the user assigned channel names. The sample printout is shown in the figure 3.2.

Figure 3.2

INFORMATION PAGE

PRINTED SYMBOL MEANING

<	Power Up
$	Date or Time Changed
*	Normal or Zoom Interval Changed
^	Alarm Toggle
!	Printer Power Interrupted
{	Slot Recording Start
}	Slot Recording End
&	Slot Recording Abort

CHANNEL NAMES

CH-1	ACL1 Temp.
CH-2	ACL1 Pressure
CH-3	ACL1 Flow Rate
CH-4	ACL1 Motor RPM
CH-5	ACL2 Temp.
CH-6	ACL2 Pressure
CH-7	ACL2 Flow Rate
CH-8	ACL2 Motor RPM

Printer Error Messages

This ScanLog stops printing if the printer runs out of paper or if the printer encounters some internal fault like print-head jammed. One of the following messages is displayed.
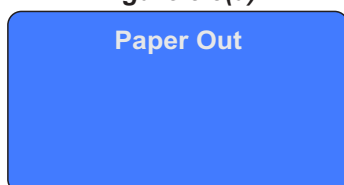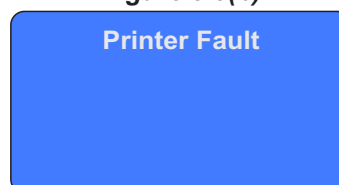
Figure 3.3(a)   *Figure 3.3(b)*

Paper Out   **Printer Fault**

In case of **paper out** error, the printing resumes automatically upon inserting the paper.

In case of **printer fault**, the power to the printer needs to be switched off. The printer then displays the message shown in figure 3.4. This messages is also displayed if the printer interface cable or power cable gets disconnected while the printing is in progress. The user can either suspend printing by pressing the Enter key (in which case the ScanLog reverts to RUN Mode) or remove the fault in which case the ScanLog presents the following options.

Figure 3.4

Connect Printer

> None
> Resume
> Recover
> Print Info Page

Select the desired operation and proceed.

Printing Operation

Figure : 3.5(a)

Printing....

Bal   30

While the ScanLog prints out the records, the message shown in figure 3.5(a) is displayed. The upper row shows the operation type; printing for 'Print' operation or Re-printing for 'Re-print' or 'Recover' or 'Resume' operation. The Lower Row displays countdown of the numbers of balance records.

Figure : 3.5(b)

Records Printed

60

Upon successful completion of the operation, the ScanLog displays the total numbers of records printed (or, re-printed) through the message shown in figure 3.5(b). Acknowledge the message using ENTER key. The ScanLog reverts to normal RUN mode.

The figure 3.6 below shows a sample printout. Notice the event records that are printed with spacial symbols in the 3rd column. Also notice that the process values for the channel(s) under alarm condition are printed with underline.

Figure 3.6

Date	Time	Symbol								
DD/MM/YY	HH:MM:SS		Ch-1	Ch-2	Ch-3	Ch-4	Ch-5	Ch-6	Ch-7	Ch-8
07/02/17	15:21:28	<	25.0	2.38	350	-19.6	25.0	2.38	350	-19.6
07/02/17	15:22:28		25.7	2.39	351	-19.4	25.7	2.39	351	-19.4
07/02/17	15:22:57	^	26.9	2.37	350	-19.0	26.9	2.37	350	-19.0

Page Header — Process Precision Instruments / Unit - I, Vasai Road / Test Laboratory Data

Power-Up Event Record

Periodic Record

Alarm Toggle Event Record

Process Value for Channel in Alarm is Underlined

Page Footer — Checked By   QC-In-Charge

PEN DRIVE (MEMORY-STICK) INTERFACE

Pen Drive Checking

Upon inserting the Pen Drive into the USB port, the ScanLog responds by displaying the message shown in the figure 3.7(a). During this time, the ScanLog checks the file format on the Pen Drive and also searches for existence of the files *Set.txt*, **Hdr.dat** & **Ftr.dat.** These 3 files are explained later. The message may last for 5 to 60 seconds depending upon the disc size and occupancy percentage.

In case of any error in reading the Pen Drive or if the Pen Drive dose not respond for more then 60 seconds, the message shown in the figure 3.7(b) is displayed. Ensure proper insertion of the Pen Drive into the USB port and acknowledge the message by pressing front panel ENTER key. The ScanLog repeats the device checking operation. If the error persists; remove the Pen Drive from the port and acknowledge the message using ENTER key. The ScanLog responds with the message shown in the figure 3.7(c). Acknowledge the message to revert to normal RUN mode screen or insert a new Pen Drive to continue with file read operation.

If ScanLog succeeds in detecting the Pen Drive then it presents the following options depending upon the files available on the Pen Drive.

        None
        Read Set.txt File
        Read Hdr.dat File
        Read Ftr.dat File

Figure 3.7(a)

Please Wait...

Figure 3.7(b)

Device Failure

Figure 3.7(c)

Insert Drive

The options *Read Set.txt File, Read Hdr.dat File* & *Read Ftr.dat File* are presented only if the files **Set.txt**, **Hdr.dat** & **Ftr.dat** exist respectively. If none of the 3 files exist then only *None* option is presented. Each option is presented one at a time. Use UP or DOWN keys to view the options & then press ENTER key to select the option. Select option '**None**' to revert to RUN Mode screen. The figure 3.6 below shows, as an example, how to save the Header file (Hdr.dat).
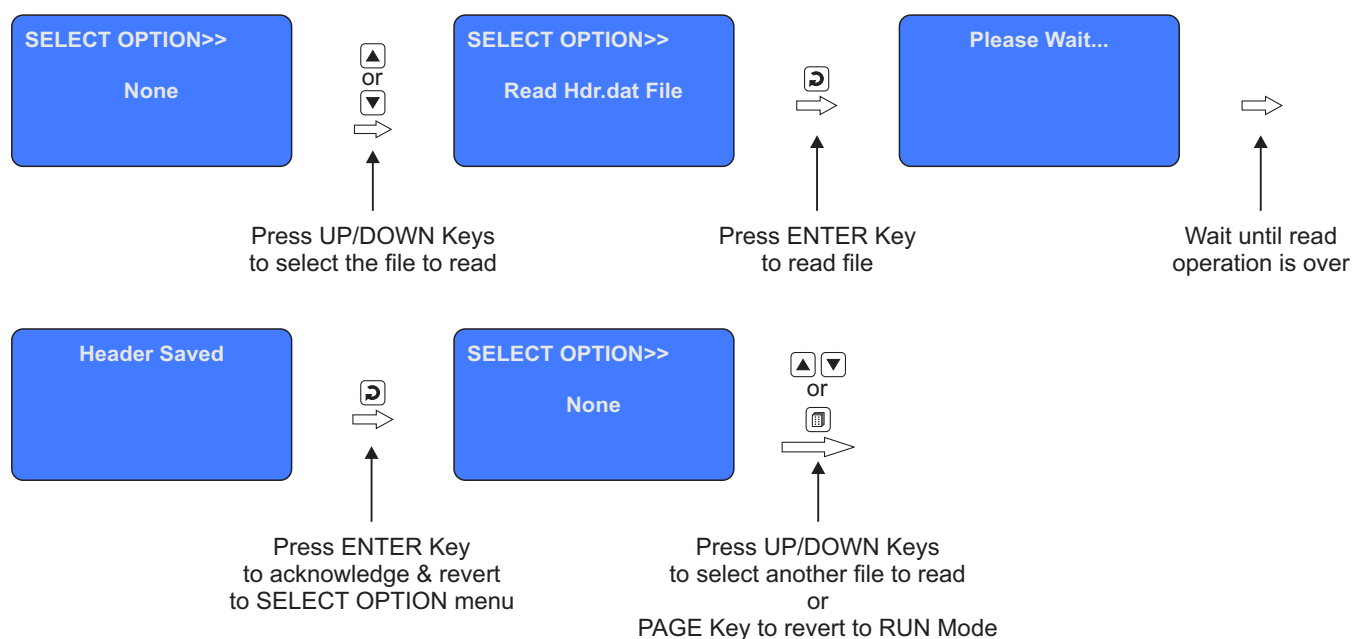
Figure 3.6

## Set.txt File

ScanLog is shipped from the factory with each channel assigned a unique factory set default name in accordance to the numbers assigned to the channels. That is, Channel-1, Channel-2, and so on. The user can, however, assign a more meaningful name (such as Boiler Pressure, Oil Temperature, etc.), to each channel for easy identification of the process parameters being measured, displayed and recorded. The Channel Names can be viewed using the Scroll key as described in *Section 2 : Basic Operation*. The user assigned Channel Names can also be printed by using the option '**Print Info Page**' for ready reference. Note that the user assigned Channel Names do not appear on the Main Screen. The Main screen always identifies the channels as CH-1, CH-2, ... and so on.

For assigning user defined Channel Names, the user should create and save a text document file with the name *Set.txt* using Microsoft Notepad Application tool. The *Set.txt* file **must** be saved on the Pen Drive in the main directory (outside of any folders).

Figure 3.7
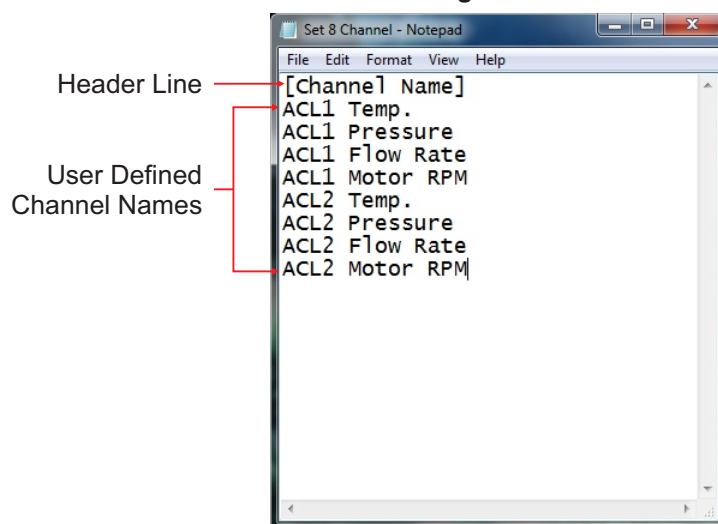
Refer Figure 3.7 for example file. Follow the guidelines below for creating and/or editing the file *Set.txt*.
1. The Header Line [Channel Name] is required and must be the first line.
2. The Channel Names should follow the Header Line.
3. Each Channel Name must be terminated with Enter key accept the last Channel Name.
4. No blank lines are permitted.
5. Each Channel Name must not exceed 16 characters.

Hdr.dat & Ftr.dat Files

The records stored inside ScanLog can be printed out on papers. Each page, optionally, can be printed with a Header and / or Footer. The Header defines the text lines that are printed at the top of the page whereas the Footer defines the text lines that are printed at the bottom of the page. The ScanLog comes with a free PC tool that facilitates the user to create Header & Footer. The tool generates the file *Hdr.dat* & *Ftr.dat* for Header & Footer respectively. These files can be transferred to the ScanLog via Pen Drive (explained earlier in this section). The files *Hdr.dat* & *Ftr.dat* **must** be saved on the Pen Drive in the main directory (outside of any folders). Refer *Appendix-C : Header / Footer PC Tool* in this manual or use the *Help* button on the PC tool for details on how to create Header & Footer.

'File Read' Error Messages

Upon selecting any of *Set.txt*, *Hdr.dat* or *Ftr.dat* file for reading, if there is an error in opening the file or any other errors are encountered while reading the file; the ScanLog displays an appropriate error message on the Upper Row of display.

For various error messages and their meaning, refer Table 3.1 below.

Table : 3.1

Error Message	What it Means
Cant Open File	Unable to open the selected file or read the file size.
Cant Read File	Unable to read the contents of selected file.
Cant Close File	Unable to close the selected file after successful reading file contents.

In case of any of the above Error Messages, make sure that the Pen Drive is firmly inserted in the USB port and retry the operation by acknowledging the error message through front panel ENTER key. If the error persists, replace the Pen Drive and / or re-copy the files.

USB Port Failure

In case of any failure of the USB port itself; one of the following two messages is displayed on the front panel LCD depending upon the type of error. The ScanLog needs servicing for any further Pen Drive operations.
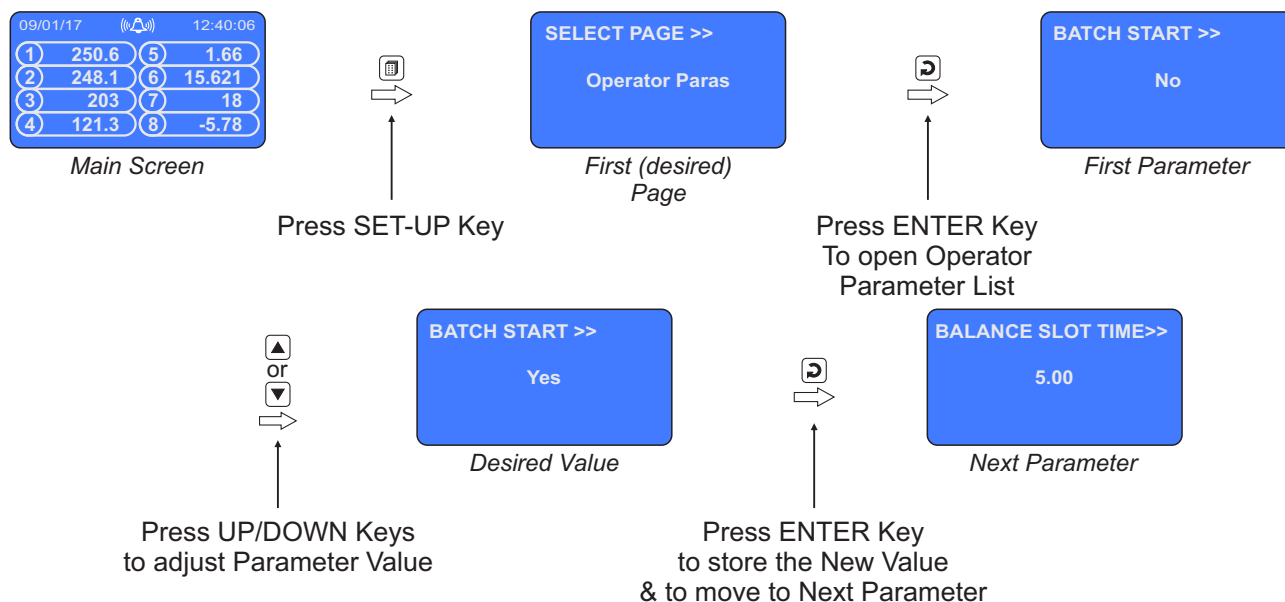
Cant Sync USB   Cant Change Baud

Section 4

OPERATOR PARAMETERS

The Figure 4.1 shows how to access Operator Parameters. The Example illustrates how to start batch recording.

Figure 4.1

Main Screen	*First (desired) Page*		*First Parameter*

Press SET-UP Key

Press ENTER Key
To open Operator
Parameter List

Press UP/DOWN Keys
to adjust Parameter Value

Press ENTER Key
to store the New Value
& to move to Next Parameter

Desired Value   *Next Parameter*

The Table 4.1 below described the Operator Parameters in detail.

Table 4.1

Parameter Description	Settings (Default Settings)
STOP PRINTING This command is presented only while the ScanLog is printing the records. Set this parameter to 'Yes' to abort the printing operation.	No Yes
SELECT OPTION *(Available only when a Printer is attached to the USB socket. This list is also presented automatically in the RUN Mode upon detection of the Printer Cable insertion)* *Refer Section 3 : PRINTER INTERFACE AND OPERATION for details on each operation.*	1. None 2. Print (New) 3. Re-print (Old) 4. Resume 5. Recover 6. Print Info Page (Default : None)
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
BALANCE SLOT TIME *(Available if Batch Recording is selected & if BATCH START command is issued)* This is a read only value that shows the remaining Batch Time.	Read Only

Parameter Description	Settings (Default Settings)
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; it may be desired 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
LINE PER PAGE This parameter sets the page length in terms of total print lines including the top and bottom margins.	25 to 100 (Default : 65)
TOP MARGINE This parameter sets the blank space in terms of numbers of print lines from the top edge of the print page.	1 to 5 (Default : 2)
BOTTOM MARGINE This parameter sets the blank space in terms of numbers of print lines above the bottom edge of the print page.	1 to 5 (Default : 2)
OFFSET RECORDS Refer 'Resume' & 'Recover' print options *described in Section 3 : PRINTER INTERFACE AND OPERATION.*	10 to 1000 (Default : 10)
PRINT PAGE HEADER>> *No* Page Header will not be printed. *On First Page* Page Header is printed only on the first page after issuing Print or Re-print command. *Every Page* Page Header is printed at the top of every new page.	No On First Page Every Page (Default : Every Page)
DELETE PAGE HEADER>> Selecting this command to 'Yes' deletes the Page Header from ScanLog's memory.	No Yes
DELETE PAGE FOOTER>> Selecting this command to 'Yes' deletes the Page Footer from ScanLog's memory.	No Yes

Section 5

READ USB PARAMETERS

Table : 5.1

Parameter Description	Settings (Default Settings)
SELECT OPTION *(Available only when a Pen Drive is attached to the USB socket. This list is also presented automatically in the RUN Mode upon detection of the Pen Drive insertion)* *Refer topic* PEN DRIVE (MEMORY-STICK) INTERFACE *in Section 3 : PRINTER INTERFACE AND OPERATION for details on each operation.*	1. None 2. Read Set.txt File 3. Read Hdr.dat File 4. Read Ftr.dat File (Default : None)

Section 6
ALARM SETTINGS

The Figure 6.1 shows how to access Alarm Setting Parameters. The Example illustrates how to change the Alarm 2 setpoint value for channel 2.

Figure 6.1

Main Screen		
Press SET-UP Key		
First Page		
Press UP/DOWN Keys to select next Page		
Next (desired) Page		
Press ENTER Key To open Alarm Settings List		
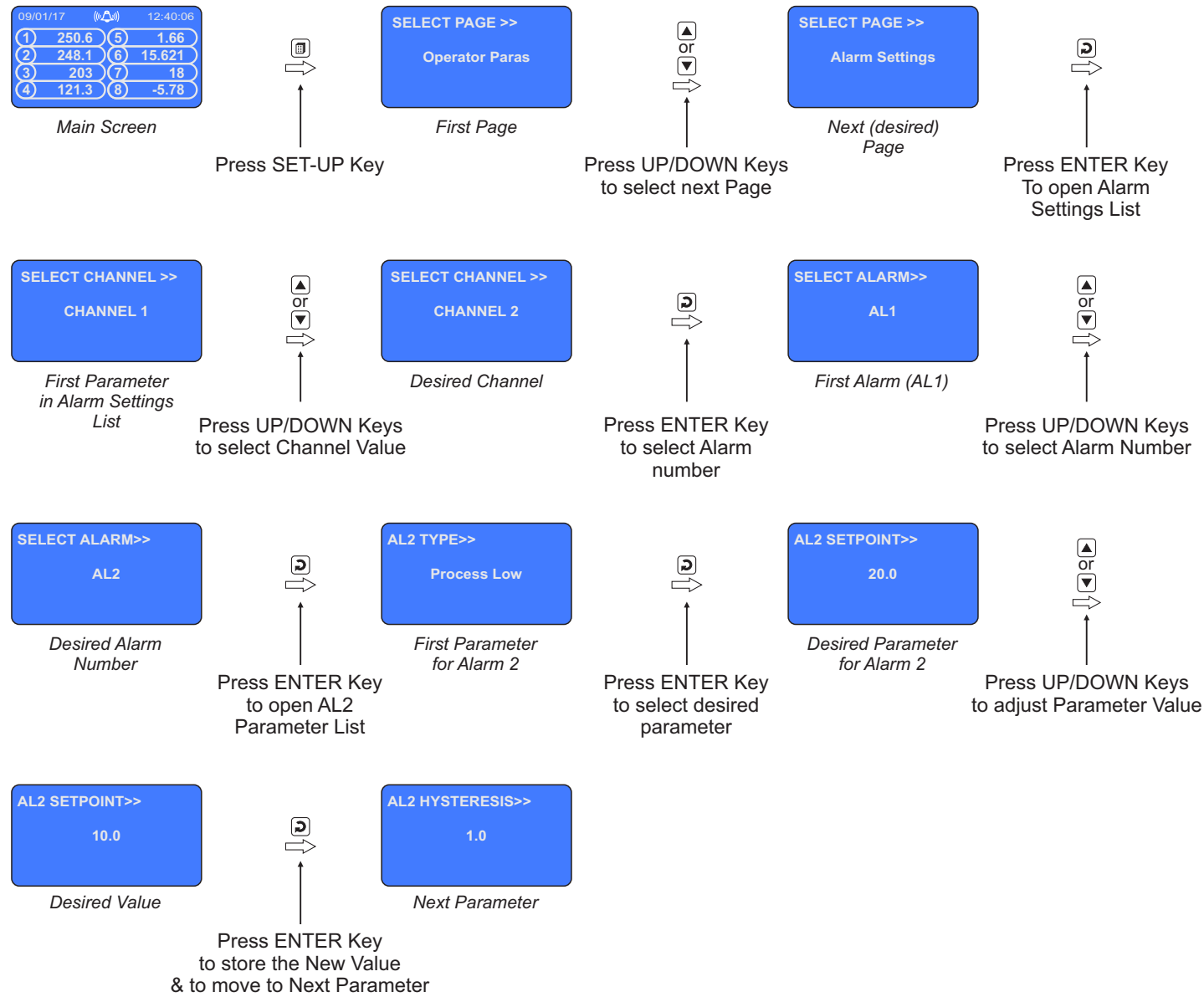
Table : 6.1

Parameter Description	Settings (Default Value)
SELECT CHANNEL Select the desired Channel Name whose Alarms parameters are to be set.	Channel-1 to Channel-8
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)
AL1 TYPE *The parameter name depends upon the Alarm selected (AL1 TYPE, AL2 TYPE, etc.).* **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)
AL1 SETPOINT *The parameter name depends upon the Alarm selected (AL1 Setpoint, AL2 Setpoint, etc.).* Setpoint Value for 'Process High' or 'Process Low' Alarm.	Min. to Max. of selected input type range (Default : 0)
AL1 HYSTERESIS *The parameter name depends upon the Alarm selected (AL1 Hysteresis, AL2 Hysteresis, etc.).* This parameter Value sets a differential (dead) band between the ON and OFF Alarm states.	1 to 30000 (Default : 20)
AL1 INHIBIT *The parameter name depends upon the Alarm selected (AL1 Inhibit, AL2 Inhibit, etc.).* **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)

<div align="center">
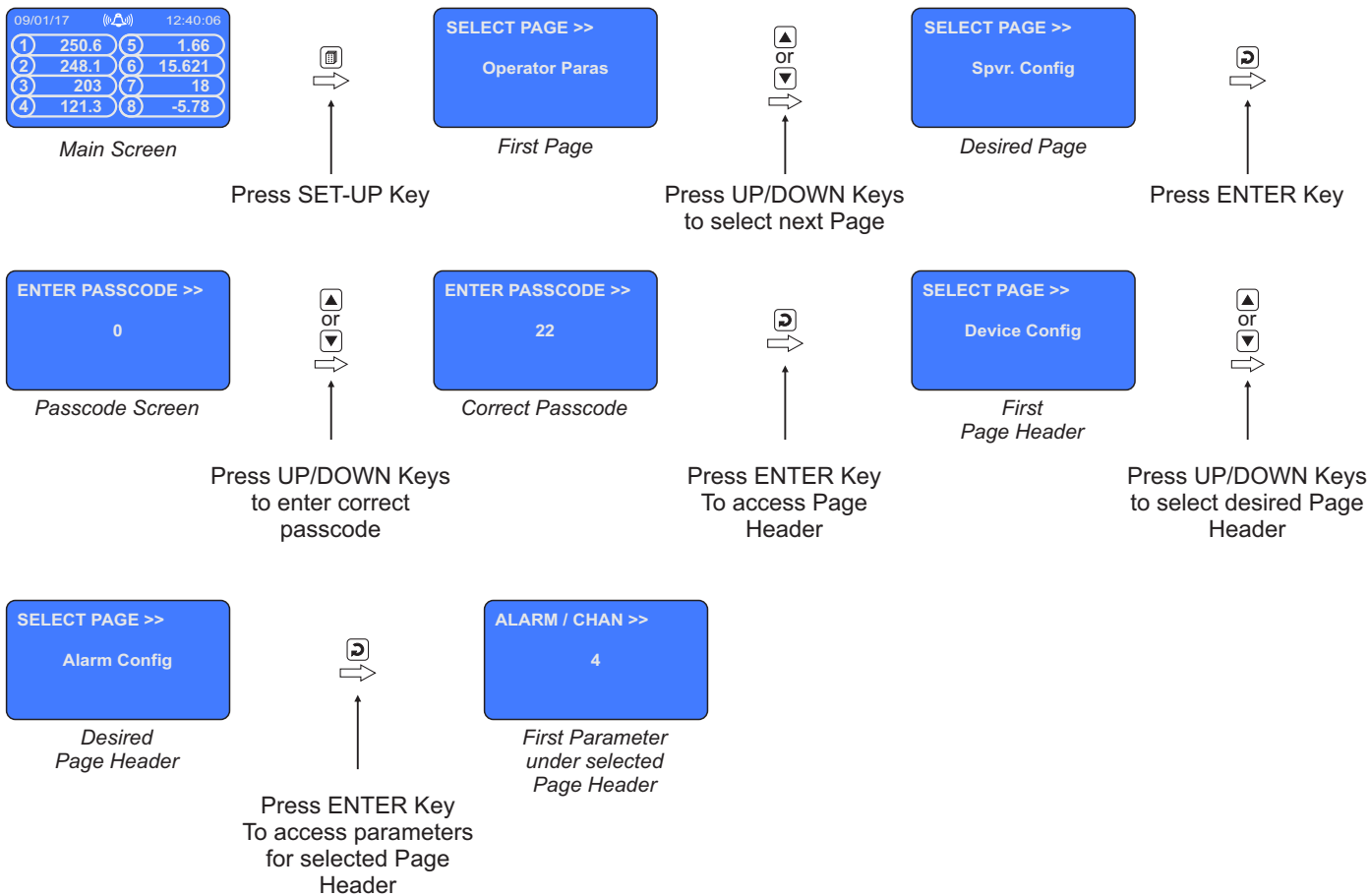
Section 7

SUPERVISORY CONFIGURATION

</div>

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*)

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.

<div align="center">

Figure 7.1

</div>

Section 8
DEVICE CONFIGURATION

Table : 8.1

Parameter Description	Settings (Default Value)
DELETE RECORDS Setting this command to 'Yes', erases all the records stored in the internal Memory.	No Yes (Default : No)

Section 9

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 : 9.1

Parameter Description	Settings (Default Value)
ALL CHAN COMMON In most applications the Data Logging Unit is used to monitor the process values at different points within a closed space (Chamber, Cold Room, etc). Thus the type of sensors and also the measurement resolution 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 and Resolution are applied to all channels. No : The parameter values for Input type and Resolution need to be set independently for each channel.	No Yes (Default : No)
SELECT CHANNEL Refer Figure 9.1 (a) and 9.1 (b).	Channel 1 to Channel 8
INPUT TYPE Set the type of Thermocouple / RTD / DC Linear signal input type connected to the selected channel.	Refer Table 9.2 (Default : 0 to 10 V)
RESOLUTION Set the process value indication resolution (decimal point). All the resolution based parameters (hysteresis, alarm setpoints etc.) then follow this resolution setting.	Refer Table 9.2

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.			
	Input Type	**Settings**	**Default**
	0 to 20 mA	0.00 to Signal High	0.00
	4 to 20 mA	4.00 to Signal High	4.00
	0 to 80 mV	0.00 to Signal High	0.00
	0 to 1.25 V	0.000 to Signal High	0.000
	0 to 5 V	0.000 to Signal High	0.000
	0 to 10 V	0.00 to Signal High	0.00
	1 to 5 V	1.000 to Signal High	1.000

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.			
	Input Type	**Settings**	**Default**
	0 to 20 mA	Signal Low to 20.00	20.00
	4 to 20 mA	Signal Low to 20.00	20.00
	0 to 80 mV	Signal Low to 80.00	80.00
	0 to 1.25 V	Signal Low to 1.250	1.250
	0 to 5 V	Signal Low to 5.000	5.000
	0 to 10 V	Signal Low to 10.00	10.00
	1 to 5 V	Signal Low to 5.000	5.000

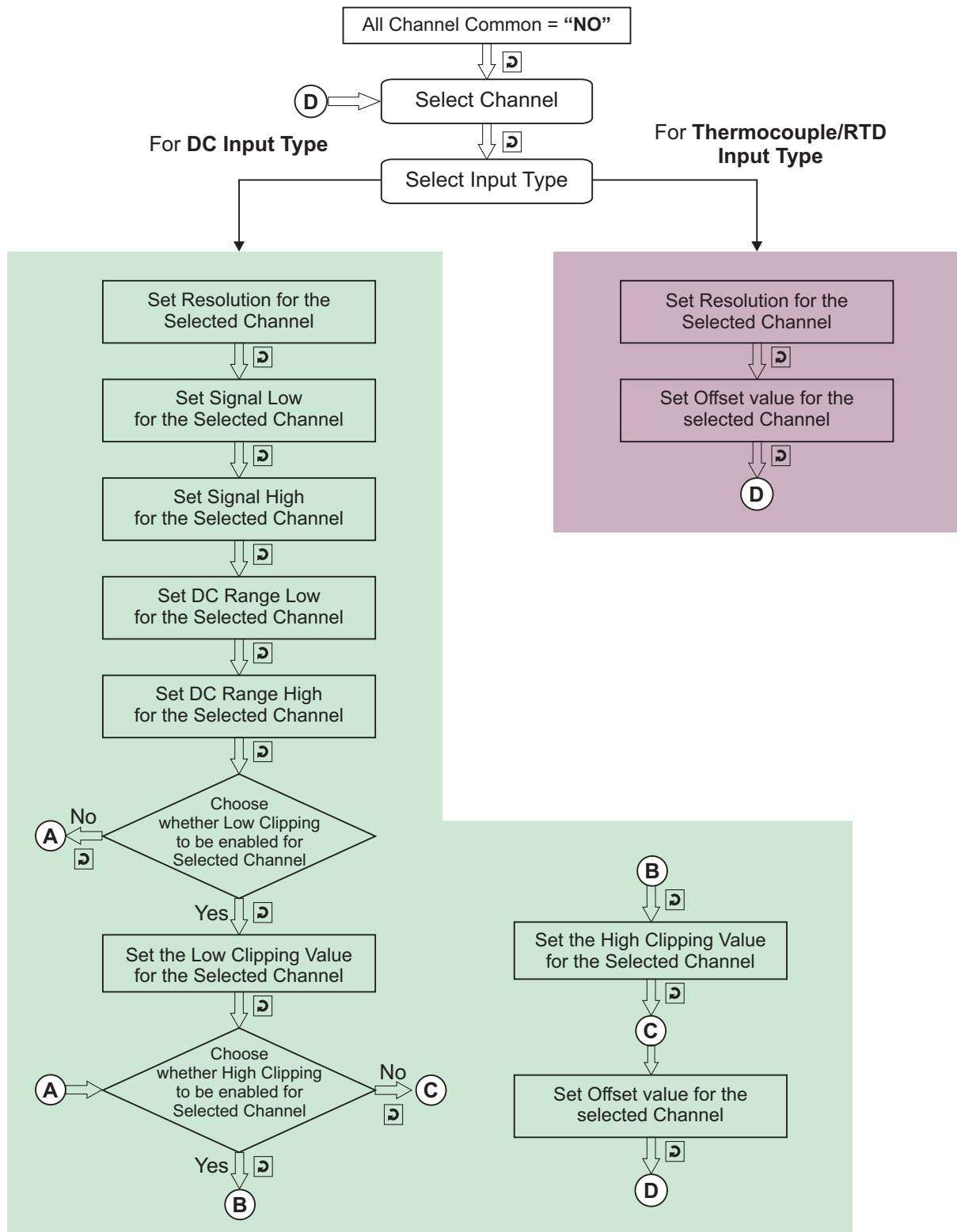| Parameter Description	Settings (Default Value)
RANGE LOW **(Applicable only for DC Linear Inputs)** The Process Value corresponding to the SIGNAL LOW value from the transmitter. Refer Appendix-A : DC Linear Signal Interface for details.	-30000 to +30000 (Default : 0)
RANGE HIGH **(Applicable only for 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 compensate known thermal gradient. This parameter is used to remove such errors. Actual (Displayed) PV = Measured PV + Offset for PV.	-30000 to +30000 (Default : 0)

Table 9.2

Option	Range (Min. to Max.)	Resolution & Unit
Type J (Fe-K)	0.0 to +960.0°C	1 °C **or** 0.1 °C
Type K (Cr-Al)	-200.0 to +1376.0°C	
Type T (Cu-Con)	-200.0 to +387.0°C	
Type R (Rh-13%)	0.0 to +1771.0°C	
Type S (Rh-10%)	0.0 to +1768.0°C	
Type B	0.0 to +1826.0°C	
Type N	0.0 to +1314.0°C	
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 Pt100	-199.9 to +600.0°C	1°C **or** 0.1 °C
0 to 20 mA	-30000 to 30000 units	1 0.1 0.01 0.001 units
4 to 20 mA		
0 to 80 mV		
Reserved		
0 to 1.25 V	-30000 to 30000 units	
0 to 5 V		
0 to 10 V		
1 to 5 V		

Figure 9.1(a)

All Channel Common = **"YES"**

For **DC Input Type**

Select Input Type

For **Thermocouple/RTD Input Type**

Set Resolution common to all Channels

Set Resolution common to all Channels

D → Select Channel for which Parameter Values to be set

Select Channel for which Offset value is to be set

Set Signal Low for the selected Channel

Set Offset value 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

No
A ← Choose whether Low Clipping to be enabled for the Channel

B

Yes

Set the Low Clipping Value for the selected Channel

Set the High Clipping Value for the selected Channel

C

A → Choose whether High Clipping to be enabled for the Channel → No **C**

Set Offset value for the selected Channel

Yes

B

D

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

Figure 9.1(b)

All Channel Common = **"NO"**

D ⟶ Select Channel

For **DC Input Type**   For **Thermocouple/RTD Input Type**

Select Input Type

DC Input Type branch:

Set Resolution 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 Low Clipping to be enabled for Selected Channel — No ⟶ A

Yes

Set the Low Clipping Value for the Selected Channel

A ⟶ Choose whether High Clipping to be enabled for Selected Channel — No ⟶ C

Yes ⟶ B

Thermocouple/RTD Input Type branch:

Set Resolution for the Selected Channel

Set Offset value for the selected Channel

D

B ⟶ Set the High Clipping Value for the Selected Channel

C ⟶ Set Offset value for the selected Channel

D

Section 10

ALARM CONFIGURATION

Table : 10.1

Parameter Description	Settings (Default Value)
ALARMS/CHAN The ScanLog 8C Printer 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)

Section 11

RECORDER CONFIGURATION

Table : 11.1

Parameter Description	Settings (Default Value)
NORMAL INTERVAL The ScanLog 8C Printer 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 Sec. 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 8C Printer 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 Sec. 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 8C Printer keeps generating records indefinitely. There are no Start / Stop commands. Suitable for continuous processes. **Batch** The ScanLog 8C Printer 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 12
RTC SETTING

Table : 12.1

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 13

UTILITIES

Table : 13.1

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. Upon issuing factory default command, the instrument first enters into 'Memory Checking' mode wherein the internal non-volatile memory is checked and this might take several seconds. After memory checking the parameter are set to factory default values and the instrument resets & restarts.	No Yes (Default : No)

Section 14

ELECTRICAL CONNECTIONS

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

⚠ **Caution**	The recorder 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 Rear Side of the enclosure. Refer figure 14.1 (a) & (b) for the versions without and with Alarm Relay outputs, respectively.

Figure 14.1 (a) : Without Alarm Relay Outputs
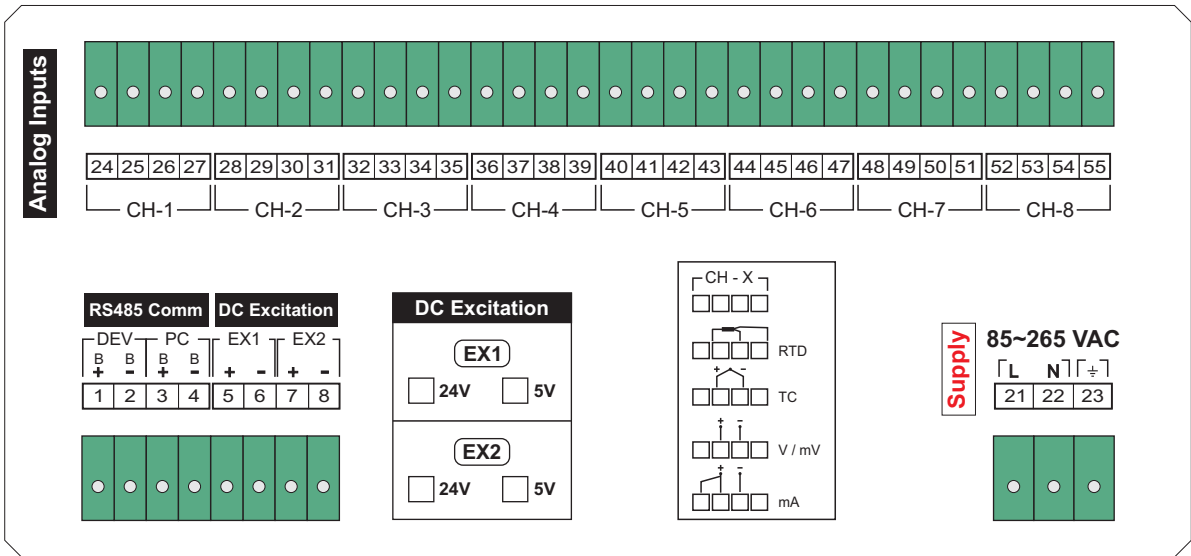
Figure 14.1 (b) : With Alarm Relay Outputs
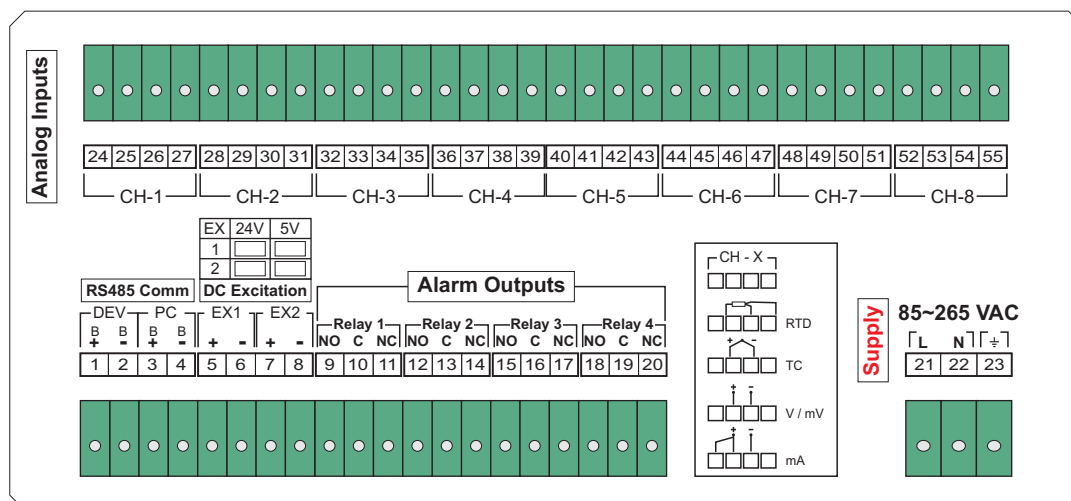
Input Channels

Each of the 4 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 14.2(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 14.2(a)
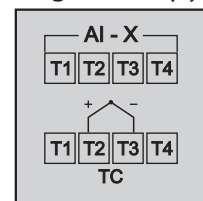
RTD Pt100, 3-wire

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 14.2(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.

Figure 14.2(b)
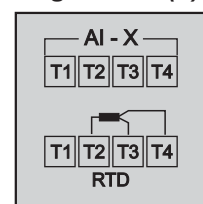
DC Linear Voltage (mV / V)

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 14.2(c).**

Figure 14.2(c)
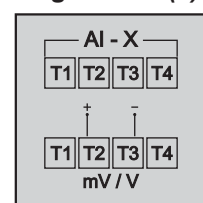
DC Linear Current (mA)

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 14.2(d).**

*Figure 14.2(d)*
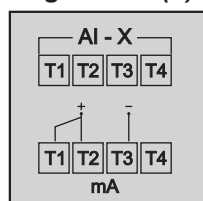
ALARM OUTPUTS

Relay 1 (Terminals : 9, 10, 11)

Relay 2 (Terminals : 12, 13, 14)

Relay 3 (Terminals : 15, 16, 17)

Relay 4 (Terminals : 18, 19, 20)

Figure 14.3

Potential-free Relay changeover contacts N/O (Normally Open), C (Common) & NC (Normally Close) rated 2A/240 VAC (resistive load) are provided as Relay outputs. Use external auxiliary device like contactor with appropriate contact rating for driving the actual load.
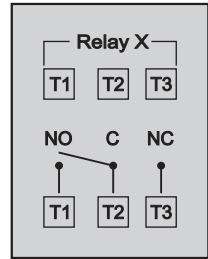
5 VDC / 24 VDC Excitation Voltage (Terminals : 5, 6, 7, 8)

If ordered, the Instrument is supplied with none, one or two excitation voltage outputs. Both the excitation outputs are factory configured for either 5VDC @ 15 mA or 24VDC @ 83 mA. The '+' and '-' terminals are for voltage 'Source' and 'Return' paths, respectively.

The availability of Excitation Voltages, as per order, are indicated (with a ✓) on the connection diagram label as shown in the figures 14.4 below.

Figure 14.4
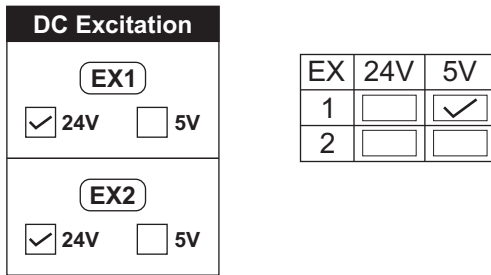
PC COMMUNICATION PORT (Terminals 3, 4)
DEVICE COMMUNICATION PORT (Terminals 1, 2)

Not used. Do not make any connections.

Figure 14.5

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 14.5. The module is not provided with fuse and power switch. If necessary, mount them separately. Use a time lag fuse rated 1A @ 240 VAC.
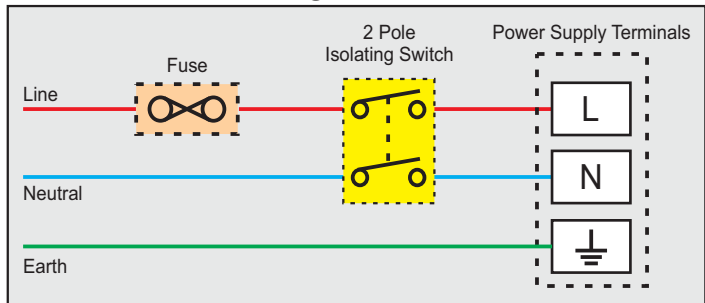
APPENDIX A
DC LINEAR SIGNAL INTERFACE

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)
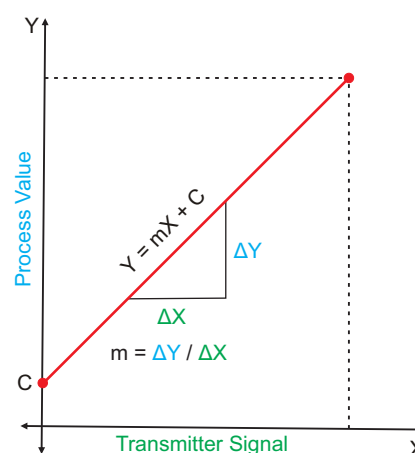
As is evident from the aforementioned transmitter examples, different transmitters produce signals varying both in *Type* (mV/V/mA) and *Range*. Most PPI instruments, thus, provide programmable Signal Type and Range to facilitate interface with a variety of transmitters. A few industry standard signal 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**
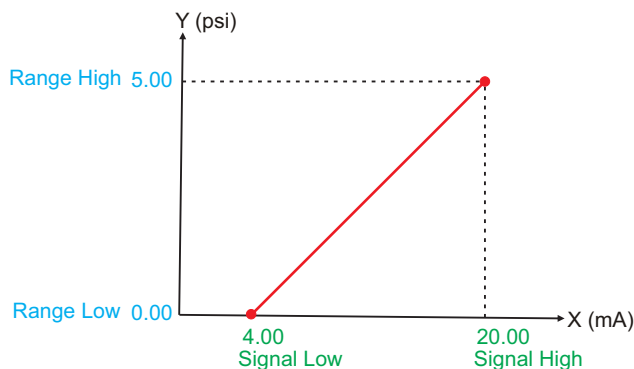
Presume the pressure is to be measured with 0.01 Resolution, that is 0.00 to 5.00 psi.

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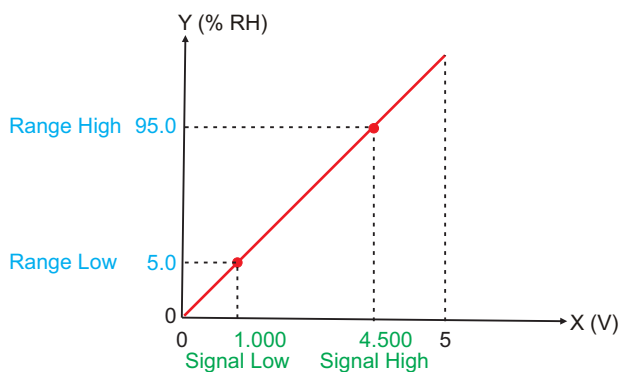
Presume the humidity is to be measured with 0.1 Resolution, that is 0.0 to 100.0 %.

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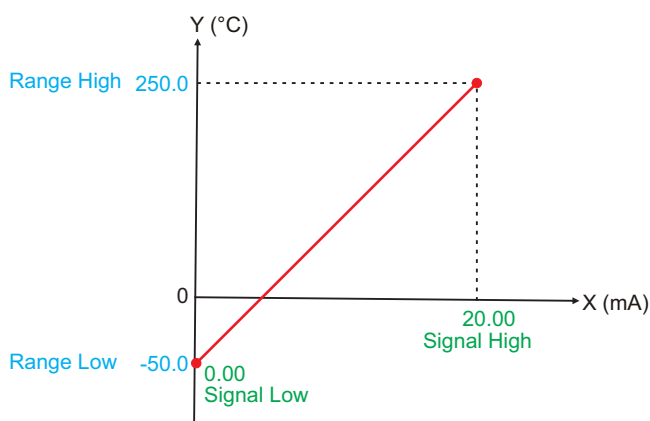
Presume the Temperature is to be measured with 0.1 Resolution, that is -50.0 to 250.0°C.

|	
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
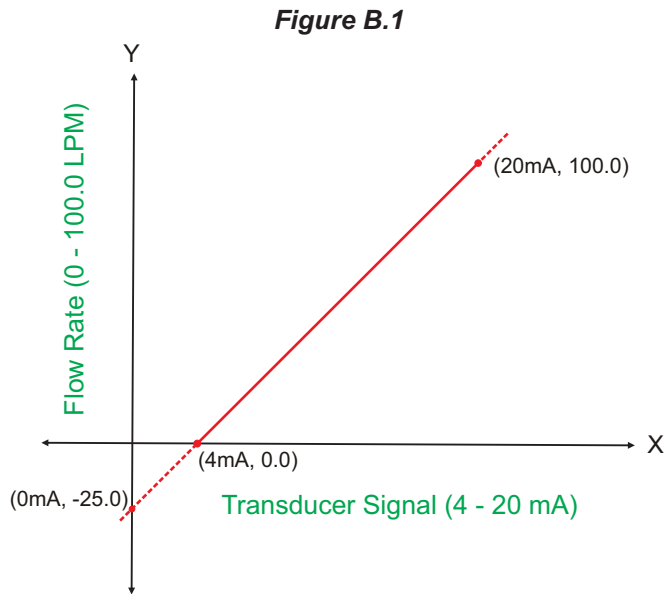
If this transmitter is to be used for a system having a flow rate range of 0.0 to 75.0 LPM then the actual useful signal range from the example transmitter is 4 mA (~ 0.0 LPM) to 16 mA (~ 75.0 LPM) only. If no Clipping is applied on the measured flow rate then the scaled PV will also include 'out-of-range' 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.
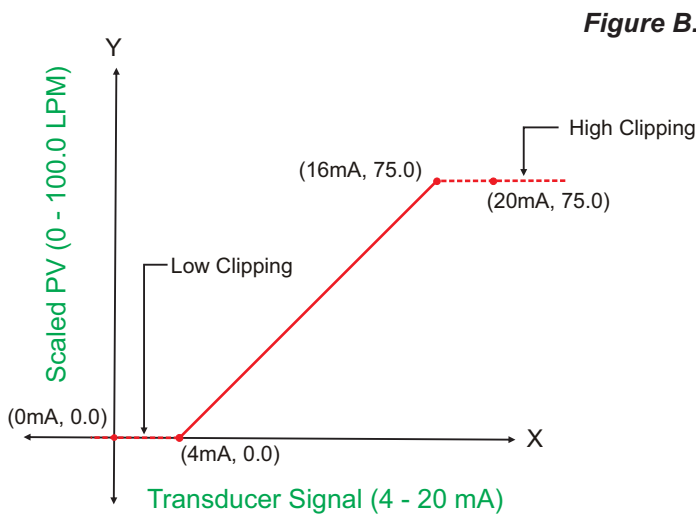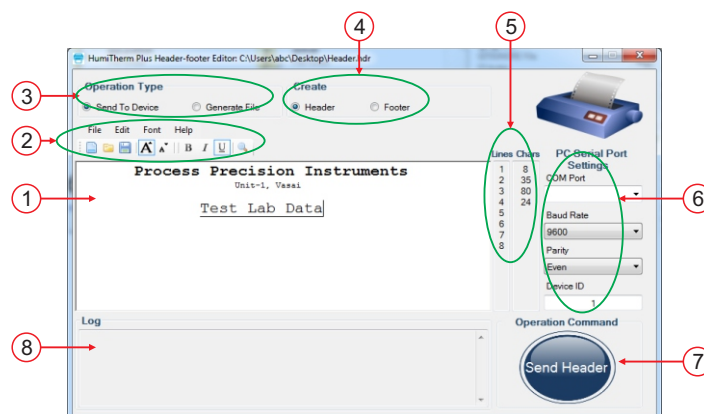
Figure B.2

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

APPENDIX C

HEADER / FOOTER PC TOOL

Figure 1

1	Text Box
	Text box for typing Header & Footer.

2	Menu Bar
	Provides tools for editing and saving the Header / Footer text files.

3 Operation Type

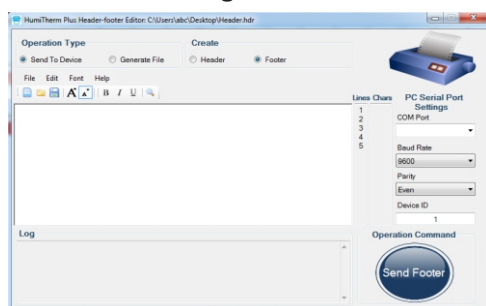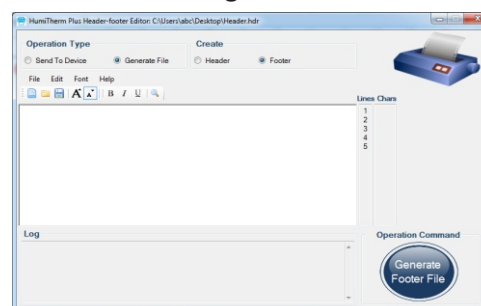<div style="display:flex">

Figure 2

Figure 3

</div>

Select 'Send to Device' option for transferring the created Header / Footer directly to the device using Serial Port. This option should be used with the devices that accept Header / Footer files through RS485 serial port. Refer Figure 2.

Select 'Generate File' option to transfer the created Header / Footer file to the device using Pen Drive. This option generates Hdr.dat & Ftr.dat files for the header & footer respectively. Generate / Copy these .dat files to the pen drive for transferring to the device. This option should be used with the devices that accept Header / Footer files through front panel USB port. Refer Figure 3.

4 Create

Choose the option to create either Header or Footer in the Text Box. Note changing from Header to Footer option will clear the Text Box.

5 Line & Character Counters for Header / Footer

The Header & Footer can have maximum 8 & 5 lines respectively. Each line can have maximum 80 characters. The lines & characters occupied depend on the font size and bold / underline attributes. The counters help keep track of lines & characters used / remaining.

6 PC Serial Port Settings

These settings are required for the Option Type 'Send to Device'. Select the *COM Port* value as per the PC communication port that shall be used for sending the header / Footer files to the device. The other settings (Baud Rate, Parity & Device ID) as per the settings in the device.

7 Operation Command Button

Use Operation command button to either send Header / Footer files to device or to generate Hdr.dat & Ftr.dat files once the Header & Footer are created.

Note that while creating Header, if the user switches to Footer by selecting the option Create Footer, the header text is cleared and is not recovered by switching back to Create Header. The same is true while Creating Footer. Thus the user must complete the creation of Header or Footer & Send to Device or Generate .dat file or Save the Header / Footer text File.

8 Log

This screen shows the messages related to the actions performed or errors.