

# ScanLog 96

## Pen Drive Version



**PPI**  
The Perfection Experts

Single / Dual Channels  
Universal Process Data Logger  
with USB Port for Data Transfer to PC  
via Pen Drive



# User Manual

## CONTENTS

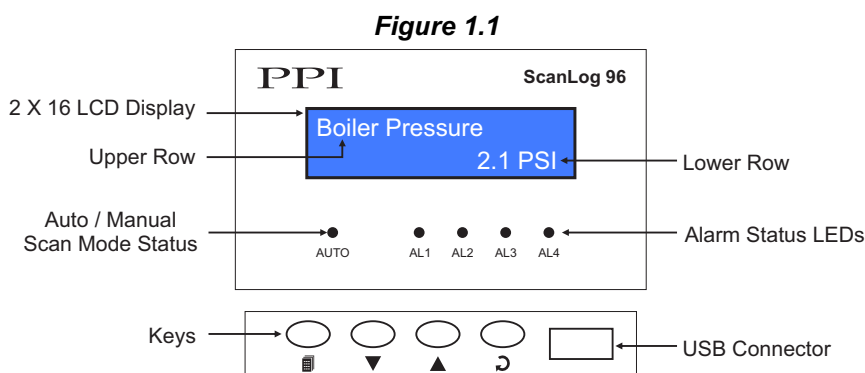
1.	FRONT PANEL : LAYOUT AND OPERATION	1
2.	BASIC OPERATION	3
3.	PEN DRIVE OPERATION	6
4.	OPERATOR PARAMETERS	12
5.	ALARMS PARAMETERS	14
6.	SUPERVISORY PARAMETERS	16
7.	DEVICE CONFIGURATION	17
8.	CHANNEL CONFIGURATION	18
9.	ALARMS CONFIGURATION	23
10.	RECORDER CONFIGURATION	24
11.	RTC SETTINGS	25
12.	UTILITIES	26
13.	MECHANICAL INSTALLATION	27
14.	ELECTRICAL CONNECTIONS	29
	APPENDIX-A : DC LINEAR SIGNAL INTERFACE	32
	APPENDIX-B : LOW / HIGH CLIPPING	34

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## Section 1

### FRONT PANEL : LAYOUT AND OPERATION

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

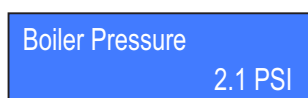


#### LCD DISPLAY

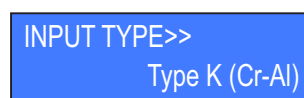
The LCD Display has 2 rows, the Upper Row & the Lower Row; each having 16 Characters.

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

**Figure 1.2(a)**



**Figure 1.2(b)**



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

#### LED INDICATORS

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





**Table 1.1**

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

## KEYS

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

**Table 1.2**

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

## PEN-DRIVE SLOT

A rectangular slot with USB connector type A is provided for Pen-Drive operation.

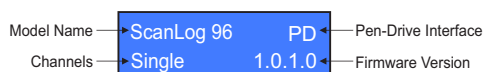


## Section 2

### BASIC OPERATION

#### POWER-UP

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



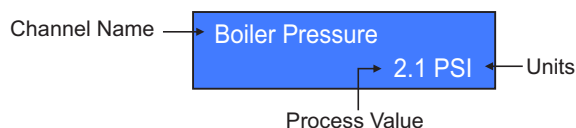
After the power-up display information, the instrument starts showing the process value(s) for Single / Dual Channels. This is the MAIN Display Mode that shall be used most often.

#### MAIN DISPLAY MODE

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

#### Process Value Screen

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



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

**Table 2.1**

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

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

#### Alarm Status Information Screen

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

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

Boiler Pressure  
AL1 AL3

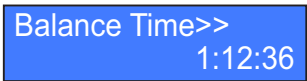
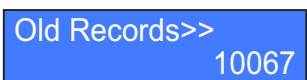

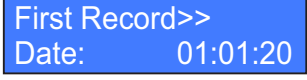
For Dual Channel Version, if both channels are under Alarm condition; use UP / DOWN keys to scroll through the channels for viewing the individual Alarm status information.

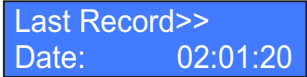
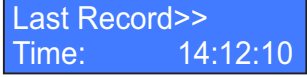
**Note :**  
The front panel ENTER key can be used as Alarm - Acknowledge key. Use Alarm Acknowledgment feature to de-activate the Alarm relays. Note that acknowledging the Alarm(s) does not remove the Alarm condition(s).

### Recording Information Screen

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

**Table 2.2**

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

Information	Sample Screen
<p><b>DATE STAMP FOR THE LAST NEW RECORD IN THE MEMORY</b></p> <p>This information shows the calendar date of recording of the latest available new record in the memory. This information does not appear if there are no new records in the memory.</p>	
<p><b>TIME STAMP FOR THE LAST NEW RECORD IN THE MEMORY</b></p> <p>This information shows the clock time of recording of the latest available new record in the memory. This information does not appear if there are no new records in the memory.</p>	

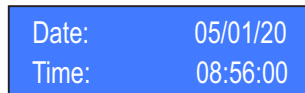
**File Name**

This screen shows the File Name that the device uses to download the internal stored records onto the Pen-Drive (Refer Section 3 : PEN-DRIVE OPERATION. This is a *Read Only* screen.



**RTC Screen**

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



## Section 3

### PEN-DRIVE OPERATIONS

The Instrument can perform both, *File Read* and *File Write*, operations on the Pen Drive. The *File Read* Operation facilitates assigning user defined names to each input channels while the *File Write* operation allows copying the Process Value records (stored inside the internal memory of the instrument) onto the Pen Drive for subsequent reading in Excel Sheet. The two file operations are described in detail in the following pages.

#### File System for Read Operation

The Instrument continuously monitors and updates the Process Values (PVs) for each channel. The Process Values are displayed on the front panel Dual Row LCD display. The Upper Row displays the channel name whereas the corresponding PV and measurement Units are shown on the Lower Row.

#### Channel Names

The Instrument is shipped from the factory with each channel assigned a factory set default name in accordance to the numbers assigned to the channels. That is, Channel-1 & Channel-2. 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 that are being measured and displayed.

#### Instrument Name

The Instrument Name is useful in identifying the equipment (like Ageing Oven, Muffle Furnace, Test Chamber, etc.) or the location (like Paint Room, Test Lab, etc.) where recording is performed. The Instrument Name is mentioned in the File Header (described later) section of the file where the stored records are copied. The instrument is shipped from the factory with a default Instrument Name; ScanLog 96. This default instrument name can be changed by the user using the file read facility.

#### File Name

The instrument (ScanLog) downloads the records by creating a unique default File Name (explained later). The user can however define a different file name by using file read facility.

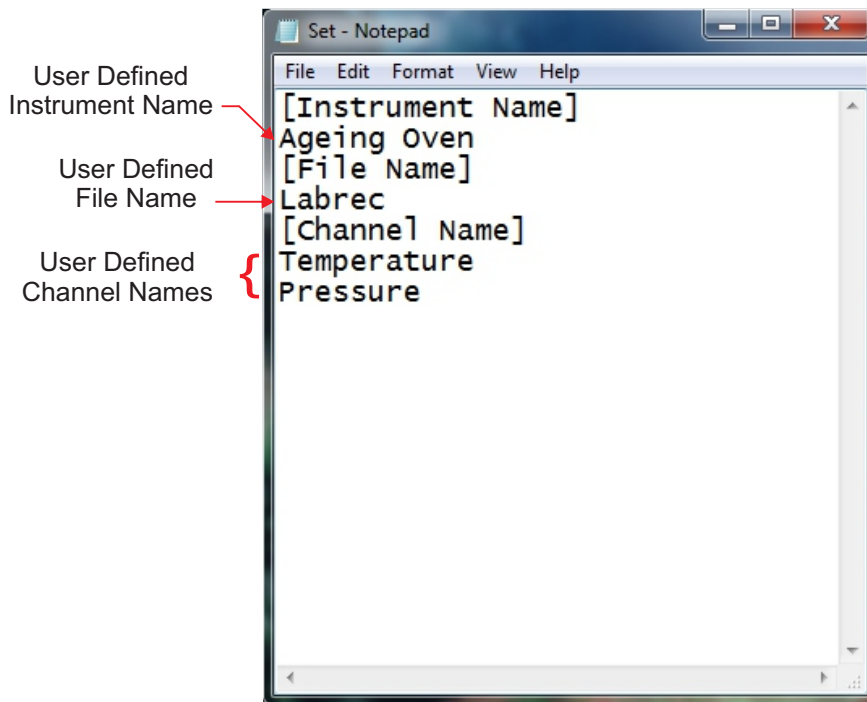
For File read operation the user should create and save a text document file with the name *Set.txt* using Microsoft Notepad Application tool. The *Set.txt* file **must** be saved on the Pen Drive in the main directory (outside of any folders).

Refer Figure 3.1 for example file. Follow the guidelines below for creating and/or editing the file *Set.txt*.

1. The lines with text within square brackets before user defined names are required.
2. The text within square brackets are case insensitive.
3. No blank lines are permitted. Do not press enter after typing last line.
4. The Channel Names must not exceed 16 characters.
5. The Instrument Name must not exceed 16 characters.
6. The File Name must not exceed 8 characters. Regardless of the letter case (lower or upper) used for the file name set by the user, the file is always created with upper case letters. For example; for the user set file name *NewName*, the instrument creates file *NEWNAME.csv*.



Figure 3.1



### File System for Write Operation

ScanLog continuously monitors and measures the process values for all channels and compares these values with the user set Alarm limits to generate Alarm Status.

A set of Process Values along with the corresponding Alarm Status for all channels, stamped with the current Date and Time, is called a *Record*. ScanLog stores such records in its internal memory at user set time interval, called *Recording Interval*. These stored records are then available for downloading to a Pen Drive via the front panel USB connector.

Each of the installed ScanLog creates and maintains its own Record-Data file on Pen Drive using either user defined File Name or a file naming scheme that involves a unique *5 Digit Code* which is factory set. This *5 Digit Code* can be viewed using the Read-only parameter “UNIQUE ID NUMBER” on the page “RTC Settings”. This Read parameter value is actually an 8 digit number of which last 5 digits are used for file naming. Under this file naming scheme the file is named *RECnnnnn.csv*; where nnnnn is the unique *5 Digit Code* just described above. For example; if the “UNIQUE ID NUMBER” is 15030006 then the file is named *REC30006.csv*. The records are downloaded to the file on Pen Drive in *Comma Separated Values (CSV)* format and thus the file is assigned the extension “.csv”. Note that once the user supplies his own File Name the ScanLog does not use the file naming scheme stated above. That is either the user defined File Name or the file name created using unique *5 Digit Code* is stored inside ScanLog’s memory. The stored File Name can be viewed using Enter Key (Refer Section 2 : Basic Operation).

Upon selecting the ‘Copy (New)’ or ‘Re-copy (Old)’ operation (explained later) after insertion of the Pen Drive; the ScanLog first searches for any existing file that matches with the file name stored in its memory.

#### Case 1 : File exists

If the File with the name stored in ScanLog’s memory exists on the pen drive, the ScanLog first reads the *File Header* that comprises the Instrument Name & the 8 digit UNIQUE ID NUMBER (Refer Figure 3.2). If the 8 digit UNIQUE ID NUMBER matches then the ScanLog appends the available stored records to the file, else the message shown in the figure is displayed :

Could not Append  
Device Differs

The above message implies that there exists multiple ScanLog with the same user defined file names. Assign a different file name and then download the records.

### Case 2 : File does not exist

If the file does not exist, the ScanLog automatically creates a new file with the name stored in its memory and then creates a *File Header* using the Instrument Name & the 8 digit UNIQUE ID NUMBER. This is followed by downloading the records. Refer Figure 3.2.

Figure 3.2

The screenshot shows a Microsoft Excel spreadsheet with the following data:

File Header		Records									
8 digit UNIQUE ID NUMBER		1	15030006								
Instrument Name		2	Ageing Oven								
		3	Date Time	Center Point	Alarm	Upper Left	Alarm	Upper Right	Alarm	Bottom Left	Alarm Bot
		4	01-01-20 16:23	265	-	217	-	213	-	214	-
		5	01-01-20 16:24	266	-	225	-	223	-	225	-
		6	01-01-20 16:24	267	-	229	-	224	-	227	-

### Back-up File System

It is possible that a file-write operation may be interrupted due to reasons like sudden power-failure or removal (or, loose-contact) of the Pen Drive, resulting in a partial transfer of records. An interrupted file-write operation makes the file unusable for appending any further records. Also, the partially transferred records in the interrupted file are lost (but are still retained inside the ScanLog's internal memory). That is, the file on Pen Drive exists with the previous records intact (if any) and becomes a read-only file.

An interrupted file-write operation event is registered by the ScanLog in its internal memory as well as on the Pen Drive that was being written. Upon resumption of operation, the ScanLog prompts for Recovery of the interrupted operation. Upon selecting the "Recover" operation, the following sequence of steps is executed.

1. A back-up file of the interrupted file is created to retain the previous records

The back-up file is named BN\_S.csv; where, 'N' is the last 3 digits of the 5 Digit Code and 'S' is the sequential number (1 to 250) assigned to the back-up file. For example; if the 5 Digit Code is 30006 and there does not exist any previous back-up file, then the new back-up file is named B006\_1.csv. If, however, there exists previous back-up file(s), then 'S' is assigned the lowest numeric value (in sequential order). For example; if a Pen Drive already contains back-up files - [B006\_1.csv, B006\_4.csv and B006\_14.csv] - then the new back-up file is named B006\_2.csv.

2. The interrupted file is deleted.
3. A New File with the same name as the deleted interrupted file is created.
4. All the records (including those that were partially transferred during the interrupted operation) are downloaded to the New File.

## PEN DRIVE (MEMORY-STICK) OPERATION

The ScanLog is provided with a front panel USB port for file read and write operations using Pen Drive.

### Pen Drive Checking

Upon inserting the Pen Drive into the USB port, the ScanLog responds by displaying the message shown in the figure 3.3(a). During this time, the ScanLog checks the file format on the Pen Drive and also searches for existence of *Set.txt* file (file containing Instrument Name, File Name & Channel Names) and any interrupted file-write operation in the previous operation. 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 does not respond for more than 60 seconds, the message shown in the figure 3.3(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 3.3(c). Acknowledge the message to revert to normal RUN mode screen or insert a new Pen Drive to continue with file read/write operations.

**Figure 3.3(a)**

**Figure 3.3(b)**

**Figure 3.3(c)**

### Select Operation

If the "Pen Drive Checking" operation is successful; the ScanLog presents one or more of the following options for the next operation:

- None
- Copy (New)
- Re-copy (Old)
- Read Settings
- Recover

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 option. Select option '**None**' to revert to normal RUN mode screen.

The '**Copy (New)**' option is presented only if there are new records available in the internal memory and the 'Recover' option is not presented.

The '**Re-copy (Old)**' option is presented only if there are old records available in the internal memory and the 'Recover' option is not presented.

The '**Read Settings**' option is presented only if the inserted Pen Drive contains a file with the name *Set.txt*.

The option '**Recover**' is presented only if the previous write file operation was interrupted. In this case, the 'Copy (New)' and 'Re-copy (Old)' options are not presented.

Use UP/DOWN keys to select the desired option and then press ENTER key to execute the selected operation.

### Recover, Copy(New), & Re-copy(Old) Operations

The 'Recover', 'Copy (New)', & 'Re-copy(Old)' options are similar in operations as they all download (copy) records available in the internal memory onto the inserted Pen Drive. The difference lies in the set of records that is downloaded.

The '**Copy (New)**' operation downloads the records that are not yet downloaded even once, that is, "new" records. After successfully downloading the "new" records, the ScanLog retains this set of records as "old" records until next successful 'Copy (New)' operation is executed.

The '**Re-copy (Old)**' operation downloads the set of records that were successfully copied during last 'Copy (New)' operation and were, thus, retained as "old" records. This feature allows re-gaining the copied records in case the Pen Drive fails or malfunctions after copying records or after inadvertent deletion of the record file from the Pen Drive.

The '**Recover**' operation copies the records that were being downloaded in the previous 'Copy (New)' or 'Re-copy (Old)' operation that was interrupted.

Upon selecting one of the above 3 operations, the ScanLog opens an existing file or creates a new file for downloading the records (refer section "File System for Write Operation")

If there is an error in opening/creating a file or deleting/re-naming a file (while creating back-up file for 'Recover' operation) or any other errors encountered while downloading the records; the ScanLog displays an appropriate error message. The Upper Row shows the message while the Lower Row shows the numbers of records pending for downloading.

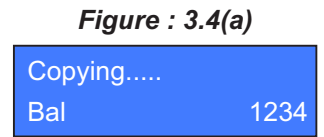
For various error messages, the operation types for their occurrence and the meaning of the errors, refer Table 3.1 below.

**Table : 3.1**

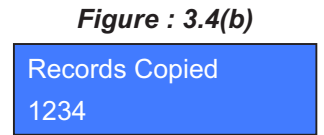
Error Message	Operation	What it Means
Cant Open File	Copy (New) Re-copy (Old) Recover	Unable to open an existing file or create a new file.
Cant Write File Bal 1234	Copy (New) Re-copy (Old) Recover	Unable to write records in an Open file.
Disc Full Bal 1234	Copy (New) Re-copy (Old) Recover	No space on Pen Drive to continue writing records in an Open file.
Cant Close File	Copy (New) Re-copy (Old) Recover	Unable to close the file after successful downloading
Cant Rename File	Recover	Unable to rename an interrupted file for back-up
Cant Delete File	Recover	Unable to delete an interrupted file.

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.

If no error is encountered while opening/creating a file for copying the records, the ScanLog begins downloading the records with the message shown in the figure 3.4(a). The upper row shows the operation type; Copying for 'Copy' operation or Re-copying for 'Re-copy' or 'Recover' operation. The Lower Row displays countdown of the numbers of balance records.



Upon successful completion of the operation, the ScanLog displays the total numbers of records copied (or, re-copied) through the message shown in figure 3.4(b). Remove the Pen Drive and acknowledge the message using ENTER key. The ScanLog reverts to normal RUN mode.



'Read Settings' Operation

Upon selecting 'Read Settings' operation, the ScanLog opens the file named *Set.txt* for reading the user defined Instrument Name, File Name & Channel Names (refer section "File System for Read Operation").

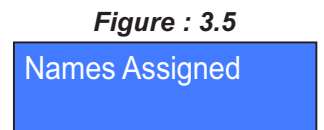
If there is an error in opening the file or any other errors encountered while reading the file; the ScanLog displays an appropriate error message on the Upper Row.

For various error messages and their meaning, refer Table 3.2 below.

**Table : 3.2**

Error Message	What it Means
Cant Open File	Unable to open the <i>Set.txt</i> file or read the file size.
Cant Read File	Unable to read the file contents.
Cant Close File	Unable to close the file after successful reading file contents.

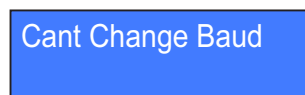
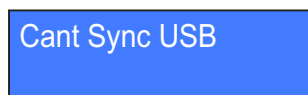
In case of any of the above Error Messages, make sure that the Pen Drive is firmly inserted in the USB port and retry the operation by acknowledging the error message through front panel ENTER key. If the error persists, replace the Pen Drive.



If no error is encountered while opening, reading or closing the file, the ScanLog displays the message shown in figure 3.5 after successfully reading file contents. Remove the Pen Drive and acknowledge the message using ENTER key. The ScanLog reverts to normal RUN mode.

**USB Port Failure**

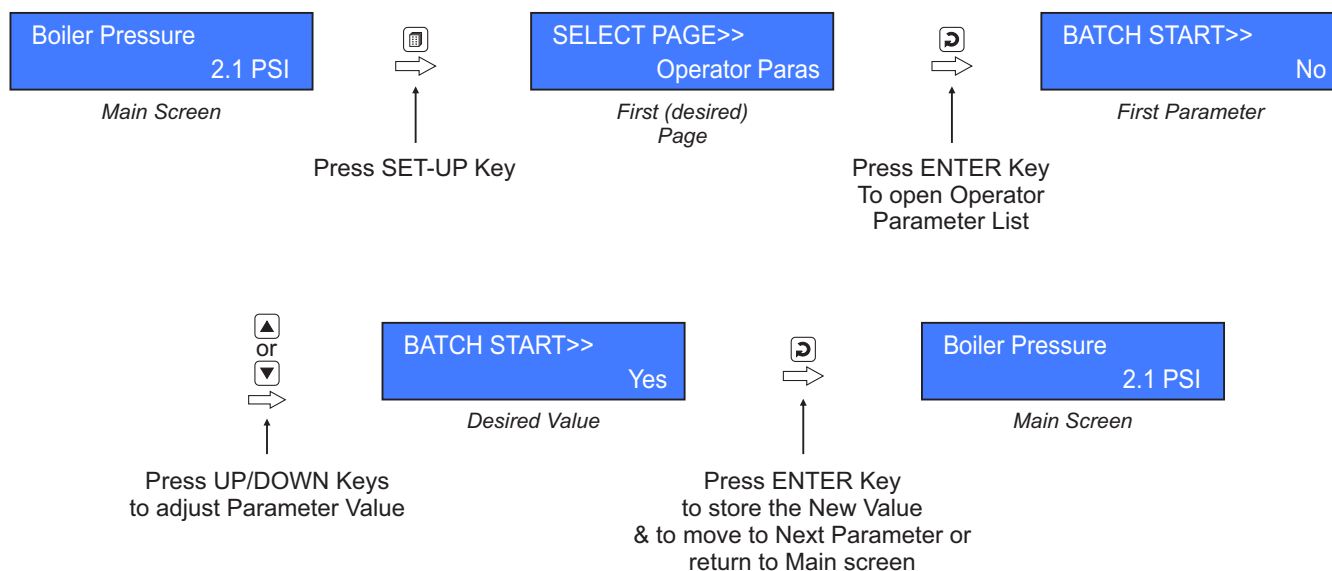
In case of any failure of the USB port itself; one of the following two messages may be displayed on the front panel LCD depending upon the type of error. The ScanLog needs servicing for any further Pen Drive operations.



## 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**



The Table 4.1 below described the Operator Parameters in detail.

**Table 4.1**

Parameter Description	Settings
<p><b>STOP COPY</b></p> <p>This command is presented only while the ScanLog is downloading (copying) the records to pen drive. Set this parameter to 'Yes' to abort the copying operation.</p>	<p>No Yes</p>
<p><b>SELECT OPTION</b></p> <p><i>(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)</i></p> <p><i>Refer Section 3 : PEN DRIVE OPERATION for details on each operation.</i></p>	<p>1. None 2. Copy (New) 3. Re-copy (Old) 4. Read Settings 5. Recover</p> <p>(Default : None)</p>

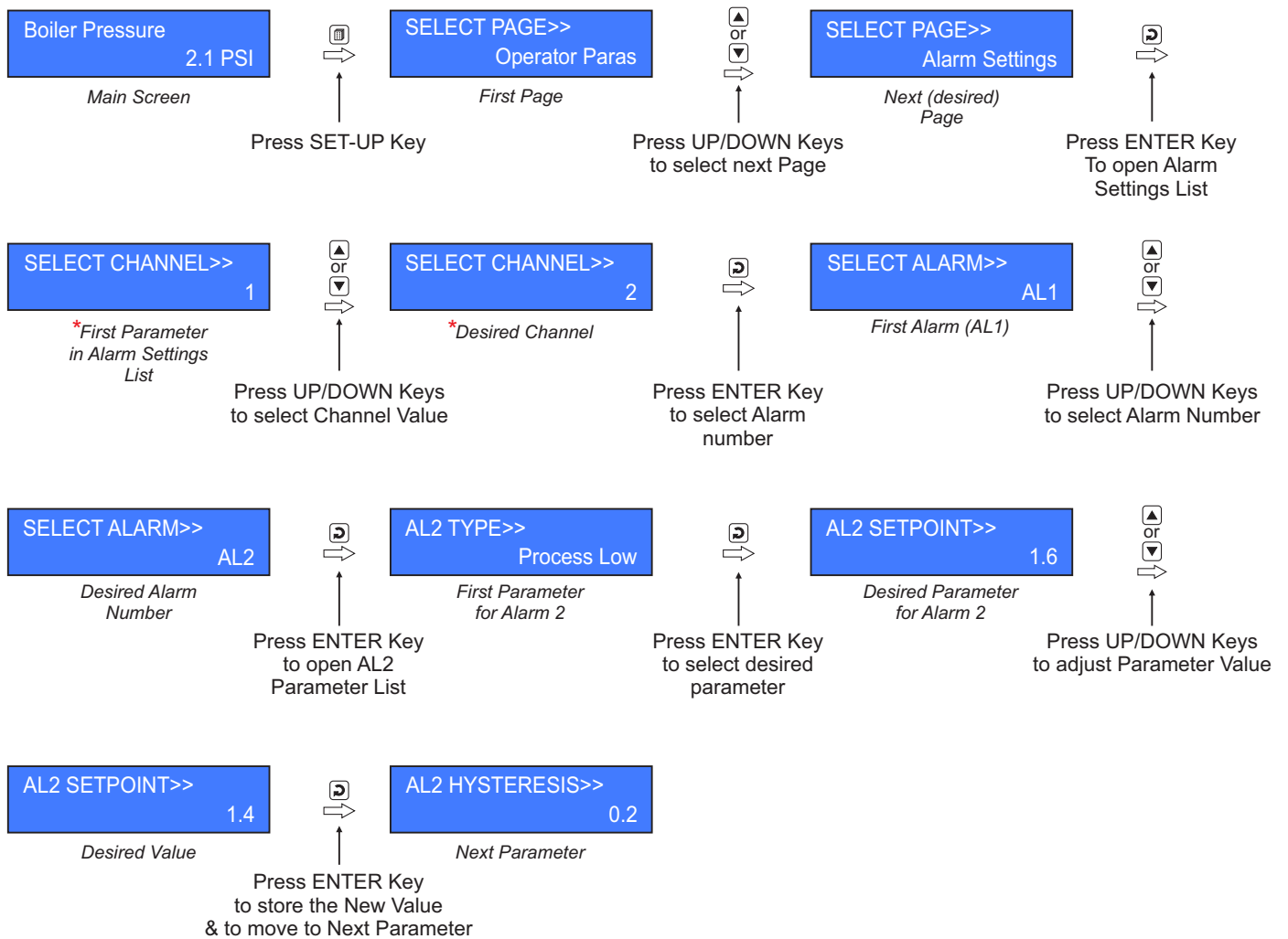
Parameter Description	Settings
<p><b>BATCH START</b> <i>(Available if Batch Recording is selected)</i></p> <p>This parameter is presented only if the batch is not already started.</p> <p>Set BATCH START command to 'Yes' to start recording the data. This is usually issued at the begin of a batch process.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



## Section 5 ALARM SETTINGS

The Figure 5.1 shows how to access Alarm Setting Parameters. The Example illustrates how to change the Alarm 2 setpoint value for channel 2.

**Figure 5.1**



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

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



Table : 5.1

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

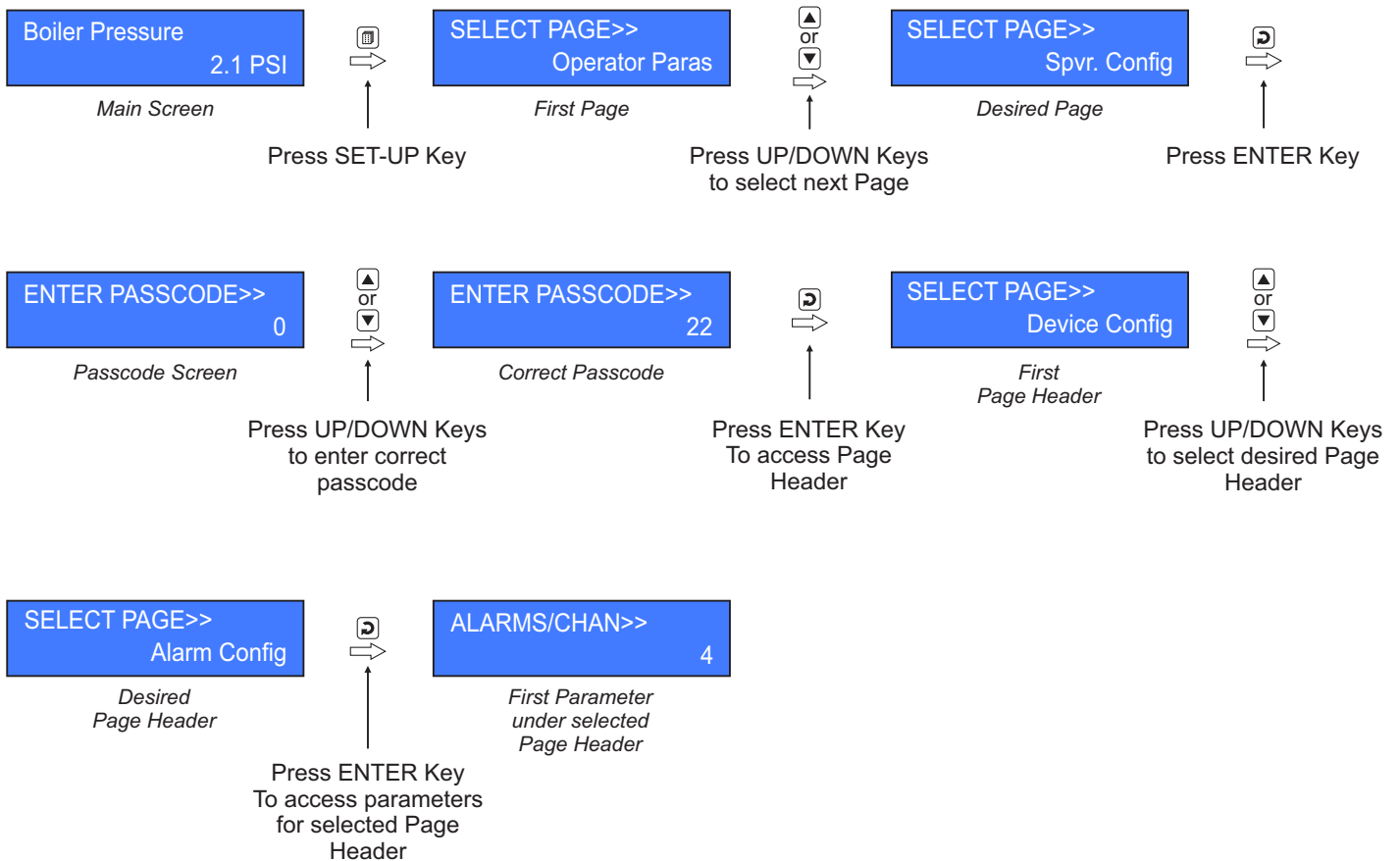
## Section 6 SUPERVISORY CONFIGURATION

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

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

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

**Figure 6.1**



Section 7  
**DEVICE CONFIGURATION**

*Table : 7.1*

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



## Section 8

### 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 : 8.1**

Parameter Description	Settings (Default Value)																								
<p><b>SELECT CHANNEL</b> (<i>This parameter is available for Dual Channel Version only</i>)</p> <p>Select the channel for which parameter settings are desired.</p>	1 or 2																								
<p><b>INPUT TYPE</b></p> <p>Set the type of Thermocouple / RTD / DC Linear signal input type connected to the selected channel.</p>	Refer Table 8.2 (Default : 0 to 10 V)																								
<p><b>RESOLUTION</b></p> <p>Set the process value indication resolution (decimal point). All the resolution based parameters (Hysteresis, Alarm Setpoints etc.) then follow this resolution setting.</p>	Refer Table 8.2																								
<p><b>UNITS</b></p> <p>Select the Units that shall be displayed along with the measured PV on the display. For temperature input (Thermocouple &amp; RTD), only °C and °F units are available and represent actual converted values. All other units available for DC Linear signal input are for indication purpose only and should be selected as per the units specified by the transmitter.</p>	Refer Table 8.3 (Default : °C)																								
<p><b>SIGNAL LOW</b> (<i>Applicable only for DC Linear Inputs</i>)</p> <p>The transmitter output signal value corresponding to RANGE LOW process value.</p> <p>Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</p>	<table border="1"> <thead> <tr> <th>Input Type</th> <th>Settings</th> <th>Default</th> </tr> </thead> <tbody> <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> </tbody> </table>	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
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																							
<p><b>SIGNAL HIGH</b> (<i>Applicable only for DC Linear Inputs</i>)</p> <p>The transmitter output signal value corresponding to RANGE HIGH process value.</p> <p>Refer <i>Appendix-A : DC Linear Signal Interface</i> for details.</p>	<table border="1"> <thead> <tr> <th>Input Type</th> <th>Settings</th> <th>Default</th> </tr> </thead> <tbody> <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> </tbody> </table>	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
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)
<p><b>RANGE LOW</b> (Applicable only for DC Linear Inputs)</p> <p>The Process Value corresponding to the SIGNAL LOW value from the transmitter.</p> <p>Refer Appendix-A: DC Linear Signal Interface for details.</p>	<p>-30000 to +30000 (Default : 0)</p>
<p><b>RANGE HIGH</b> (Applicable only for DC Linear Inputs)</p> <p>The Process Value corresponding to the SIGNAL HIGH value from the transmitter.</p> <p>Refer Appendix-A: DC Linear Signal Interface for details.</p>	<p>-30000 to +30000 (Default : 1000)</p>
<p><b>LOW CLIPPING</b> (Applicable only for DC Linear Inputs)</p> <p>Refer Appendix-B.</p>	<p>Disable Enable (Default : Disable)</p>
<p><b>LOW CLIP VAL</b> (Applicable only for DC Linear Inputs)</p> <p>Refer Appendix-B.</p>	<p>-30000 to HIGH CLIP VAL (Default : 0)</p>
<p><b>HIGH CLIPPING</b> (Applicable only for DC Linear Inputs)</p> <p>Refer Appendix-B.</p>	<p>Disable Enable (Default : Disable)</p>
<p><b>HIGH CLIP VAL</b> (Applicable only for DC Linear Inputs)</p> <p>Refer Appendix-B.</p>	<p>LOW CLIP VAL to 30000 (Default : 1000)</p>
<p><b>ZERO OFFSET</b></p> <p>In many application, the measured <b>PV</b> at the input requires a constant value to be added or subtracted to obtain a final process value for removing sensor zero error or to nullify known thermal gradient.</p> <p>Actual (Displayed) PV = Measured PV + Offset for PV.</p>	<p>-30000 to +30000 (Default : 0)</p>

Table 8.2

Option	Range (Min. to Max.)	Resolution & Unit
Type J (Fe-K)	0.0 to +960.0°C / +32.0 to +1760.0°F	1 °C /°F or 0.1 °C /°F
Type K (Cr-Al)	-200.0 to +1376.0°C / -328.0 to +2508.0°F	
Type T (Cu-Con)	-200.0 to +387.0°C / -328.0 to +728.0°F	
Type R (Rh-13%)	0.0 to +1771.0°C / +32.0 to +3219.0°F	
Type S (Rh-10%)	0.0 to +1768.0°C / +32.0 to +3214.0°F	
Type B	0.0 to +1826.0°C / +32.0 to +3218.0°F	
Type N	0.0 to +1314.0°C / +32.0 to +2397.0°F	
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 to +600 °C / -328 to +1112 °F or -199.9 to +600.0 °C / -328.0 to +1112.0 °F	1°C or 0.1 °C
0 to 20 mA	-30000 to 30000 units	1 Unit 0.1 Unit 0.01 Unit 0.001 Unit
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		

**Table 8.3**

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

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





## Section 9 ALARM CONFIGURATION

*Table : 9.1*

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

## Section 10 RECORDER CONFIGURATION

*Table : 10.1*

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

## Section 11 RTC SETTING

*Table : 11.1*

Parameter Description	Settings
<b>TIME (HH:MM)</b> Set current clock time in Hrs:Min (24 Hours format).	0.0 to 23:59
<b>DATE</b> Set current calendar date.	1 to 31
<b>MONTH</b> Set current calendar month.	1 to 12
<b>YEAR</b> Set current calendar year.	2000 to 2099
<b>UNIQUE ID NUMBER</b> This is a Read-only parameter. The value shown is arbitrary and will differ from device to device. The last 5 digits are used for generating the default (factory set) File Name for downloading the records. The last 3 digits are used for generating the Back Up File Name. Refer Section 3 : PEN DRIVE OPERATION.	Read Only



## Section 12 UTILITIES

**Table : 12.1**

Parameter Description	Settings (Default Value)
<p><b>LOCK</b> <b>UNLOCK</b></p> <p>These parameters lock or unlock parameter settings. Locking inhibits editing (modifying) of parameter values to prevent any inadvertent changes by the operator.</p> <p>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.</p> <p>For locking, the parameter LOCK needs to be set to 'Yes' only once.</p>	<p>No Yes (Default : No)</p>
<p><b>FACTORY DEFAULT</b></p> <p>Setting this parameter to 'Yes', resets all parameters to their default values. The instrument resets &amp; restarts.</p>	<p>No Yes (Default : No)</p>



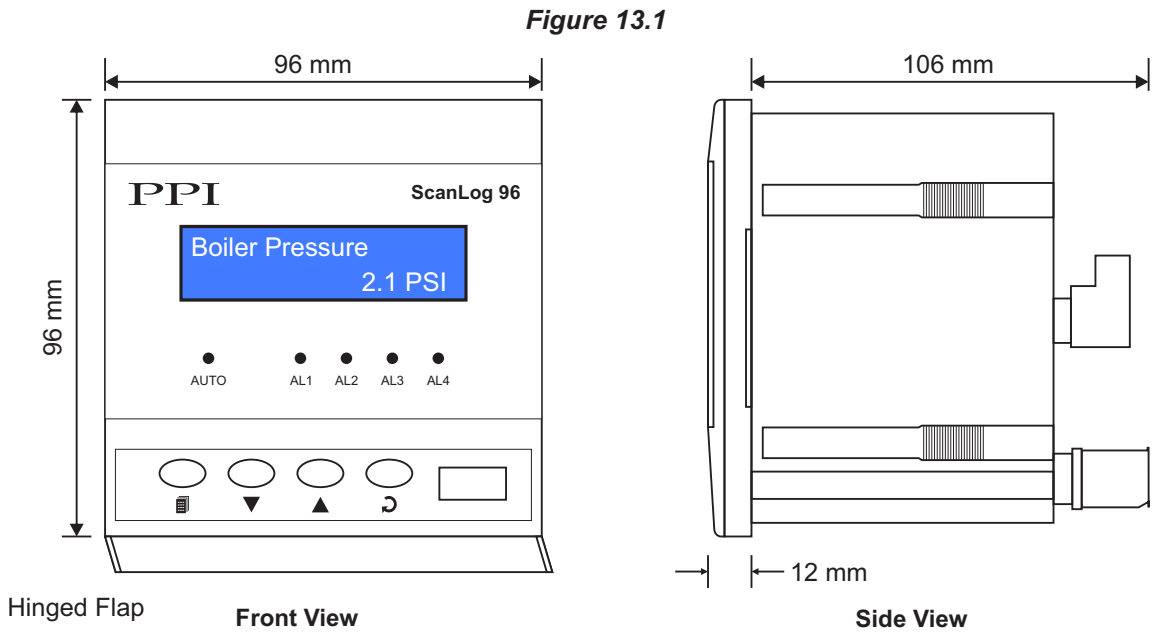
## Section 13 MECHANICAL INSTALLATION

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

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

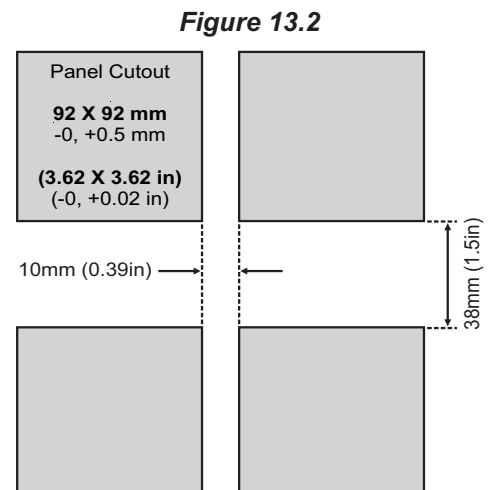
### OUTER DIMENSIONS

The Figure 13.1 shows the outer dimensions.



### PANEL CUTOUT AND RECOMMENDED MINIMUM SPACING

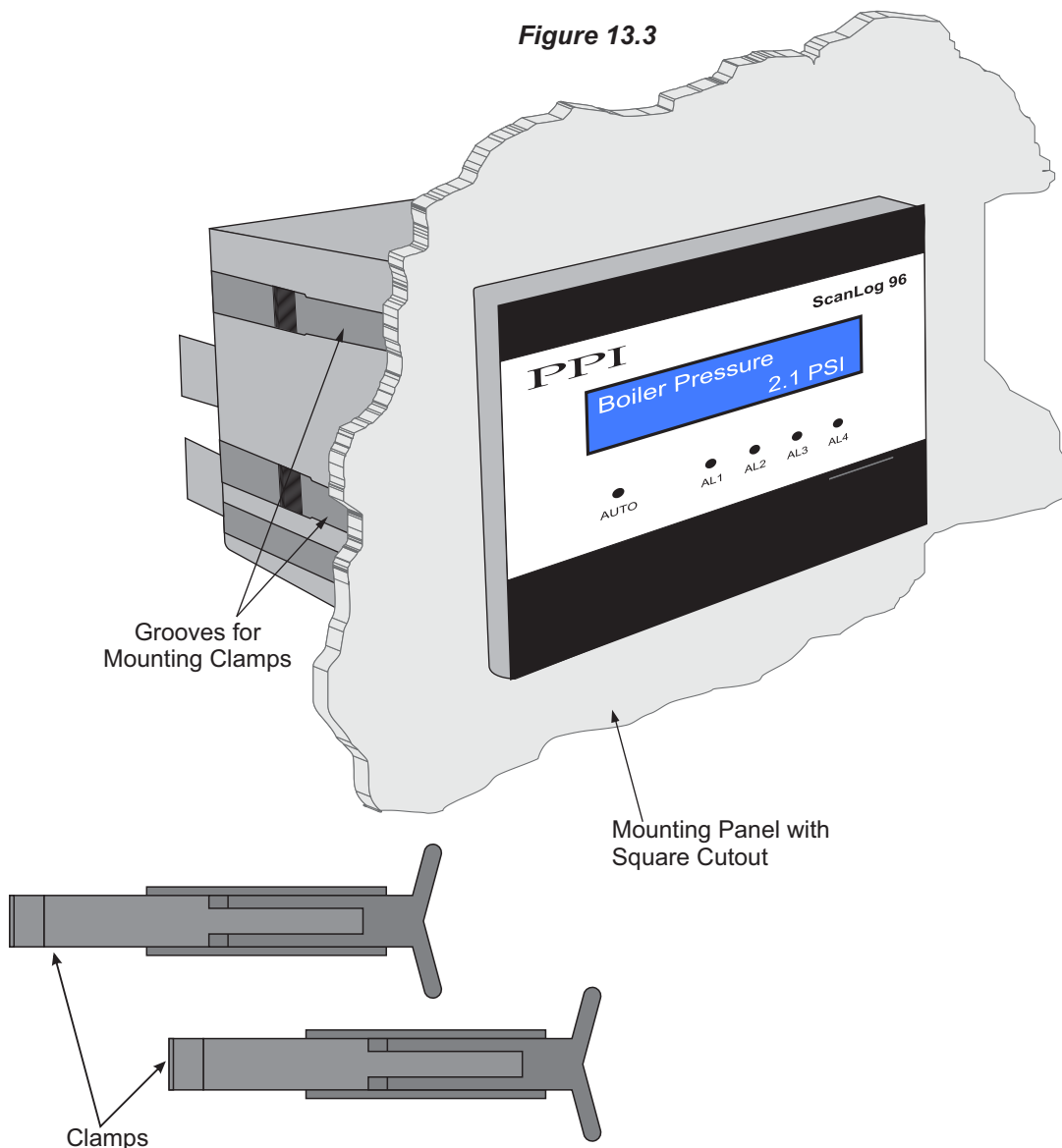
The Figure 13.2 shows the panel cutout requirements for a single instrument and also the minimum spacing recommended if several instruments are required to be mounted on a single panel.



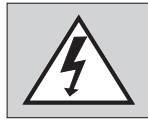
## PANEL MOUNTING

Follow the steps below for mounting the instrument on panel:

1. Prepare a rectangular cutout to the size shown in Figure 13.2.
2. Remove the Panel Mounting Clamps from the instrument Enclosure.
3. Insert the rear of the instrument housing through the panel cutout from the front of the mounting panel.
4. Hold the instrument gently against the mounting panel such that it positions correctly against the panel wall, see Figure 13.3. Apply pressure only on the bezel and not on the front label.
5. Insert the clamps on either side of the enclosure in the grooves provided and slide them forward until this are firmly in contact with the rear face of the mounting panel. Refer Figure 13.3 below. There are 2 clamps per side, that is, total 4 clamps.



## Section 14 ELECTRICAL CONNECTIONS



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

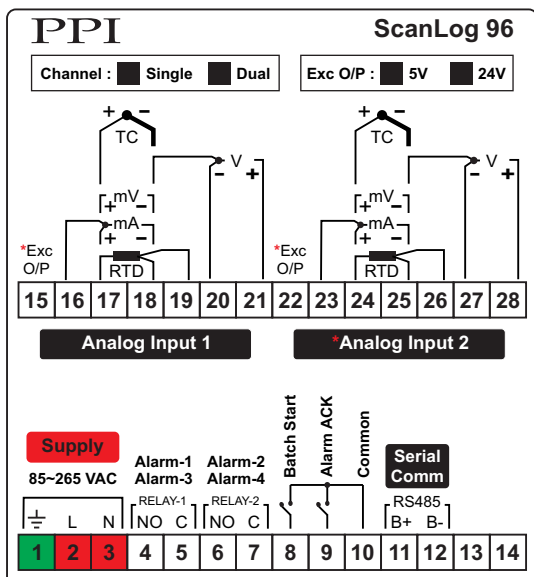
**Caution**  
The ScanLog is designed for installation in an enclosure which provides adequate protection against electric shock. Local regulations regarding electrical installation should be rigidly observed. Consideration should be given to prevention of access to the Power Supply terminals by unauthorized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

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

### CONNECTION DIAGRAM

The Electrical Connection Diagram is shown on the Top Side of the enclosure. Refer figure 14.1.

*Figure 14.1*



**\*Notes:**

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

## Input Channels (Analog Input 1 & Analog Input 2)

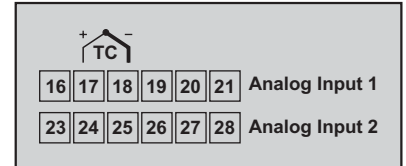
Channel 1 & Channel 2 are designed to interface with Thermocouples, RTD Pt100, mA, mV & V. The wiring connections for each type are described below.

### Thermocouple

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

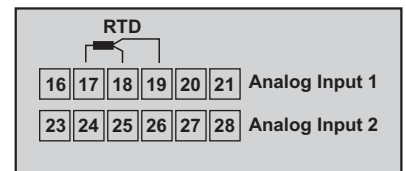


### RTD Pt100, 3-wire

Connect single leaded end and the double leaded ends of **RTD** bulb as shown in **Figure 14.2(b)**. Double leaded connections are interchangeable for respective channel.

Use copper conductor leads of very low resistance ensuring that all 3 leads are of the same gauge and length. Avoid joints in the cable.

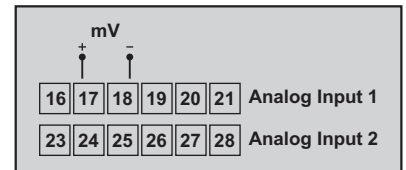
**Figure 14.2(b)**



### DC Linear mV

Use a shielded twisted pair with the shield grounded at the signal source for connecting mV source. Connect common (-) and the signal (+) wires as shown in **Figure 14.2(c)**.

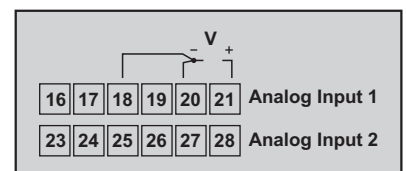
**Figure 14.2(c)**



### DC Linear V

Use a shielded twisted pair with the shield grounded at the signal source for connecting V source. Connect common (-) and the signal (+) wires as shown. Also short terminals 18 & 20 for Channel 1 and terminals 25 & 27 for Channel 2, respectively. Refer **Figure 14.2(d)**.

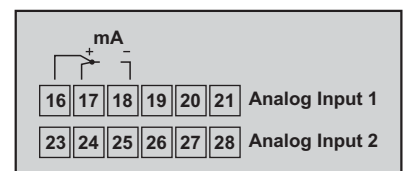
**Figure 14.2(d)**



### DC Linear Current (mA)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA source. Connect common (-) and the signal (+) wires as shown. Also short terminals 16 & 17 for Channel 1 and terminals 23 & 24 for Channel 2, respectively. Refer **Figure 14.2(e)**.

**Figure 14.2(e)**

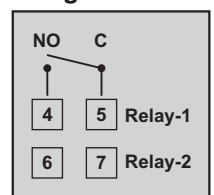


## ALARM OUTPUTS

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

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

**Figure 14.3**

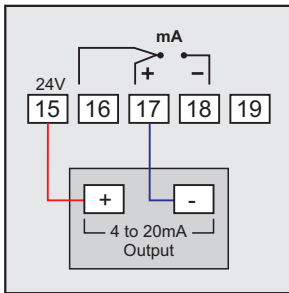




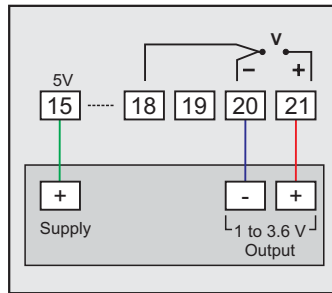
### DC EXCITATION VOLTAGE

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

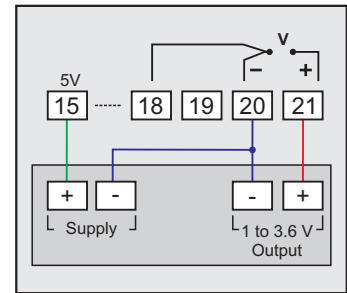
For wiring convenience the excitation voltage is made available on two separate terminals (15 & 22). The following figures illustrate a few connection examples for channel 1.



2-wire Current Transmitter (24VDC Supply)



3-wire Voltage Transmitter (5VDC Supply)



4-wire Voltage Transmitter (5VDC Supply)

Figure 14.4 (a)

### DIGITAL INPUT FOR BATCH START COMMAND

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

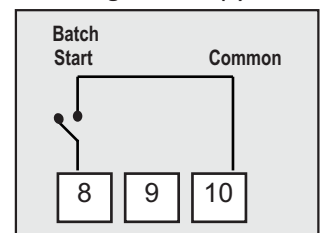
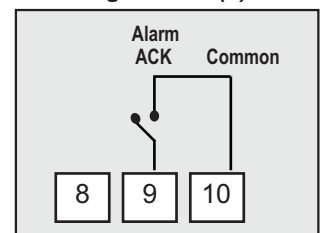


Figure 14.4 (b)

### DIGITAL INPUT FOR ALARM ACKNOWLEDGE

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



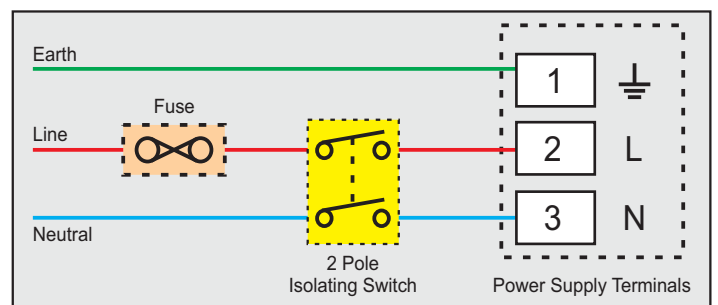
### SERIAL COMMUNICATION PORT

Not used. Do not make any connections.

### 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 0.5mm<sup>2</sup> 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.

Figure 14.5



## APPENDIX A

### DC LINEAR SIGNAL INTERFACE

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

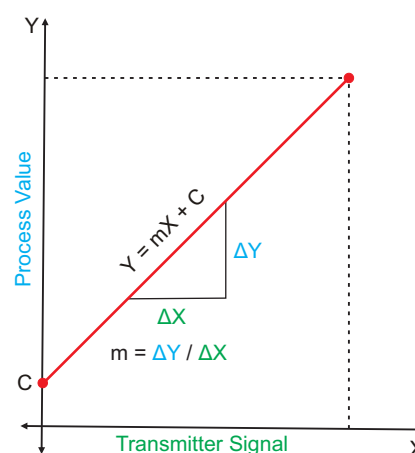
1. Pressure Transmitter producing **4 to 20 mA** for **0 to 5 psi**
2. Relative Humidity Transmitter producing **1 to 4.5 V** for **5 to 95 %RH**
3. Temperature Transmitter producing **0 to 20 mA** for **-50 to 250 °C**

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

$$Y = mX + C$$

Where;

- X : Signal Value from Transmitter
- Y : Process Value Corresponding to Signal Value X
- C : Process Value Corresponding to X = 0 (Y-intercept)
- m : Change in Process Value per unit Change in Signal Value (Slope)



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

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

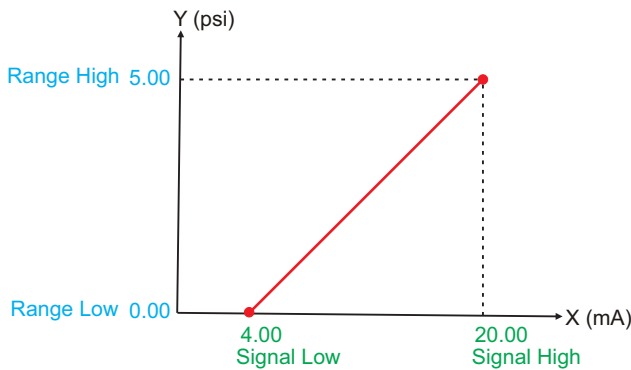
The linear transmitters usually specify two signal values (Signal Low and Signal High) and the corresponding Process Values (Range Low and Range High). In the example Pressure Transmitter above; the Signal Low, Signal High, Range Low & Range High values specified are: 4 mA, 20 mA, 0 psi & 5 psi, respectively.

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

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

The following examples illustrate appropriate parameter value selections.

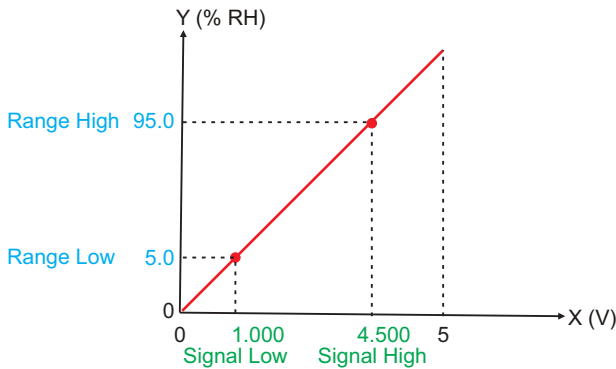
**Example 1:** Pressure Transmitter producing **4 to 20 mA** for **0 to 5 psi**



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

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

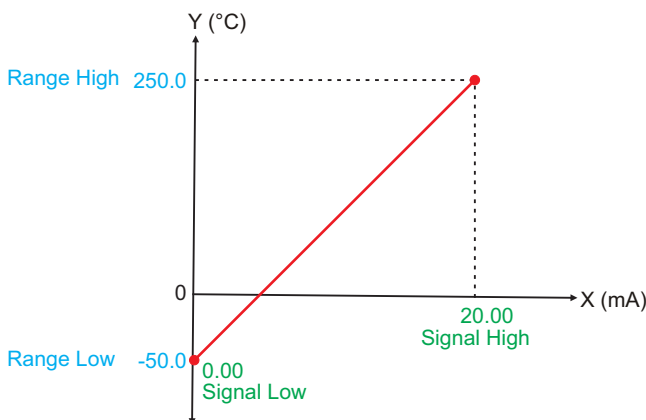
**Example 2:** Relative Humidity Transmitter producing **1 to 4.5 V** for **5 to 95 %RH**



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

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

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



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

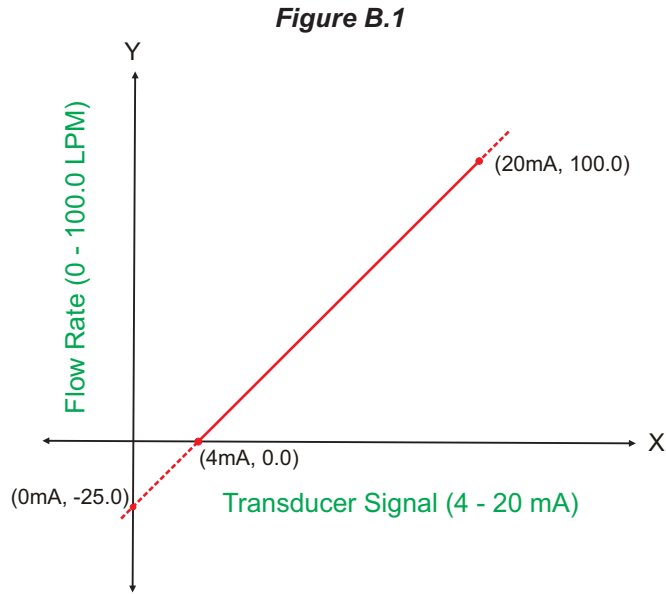
Input Type	: 0-20 mA
Signal Low	: 0.00 mA
Signal High	: 20.00 mA
PV Resolution	: 0.1
Range Low	: -50.0
Range High	: 250.0



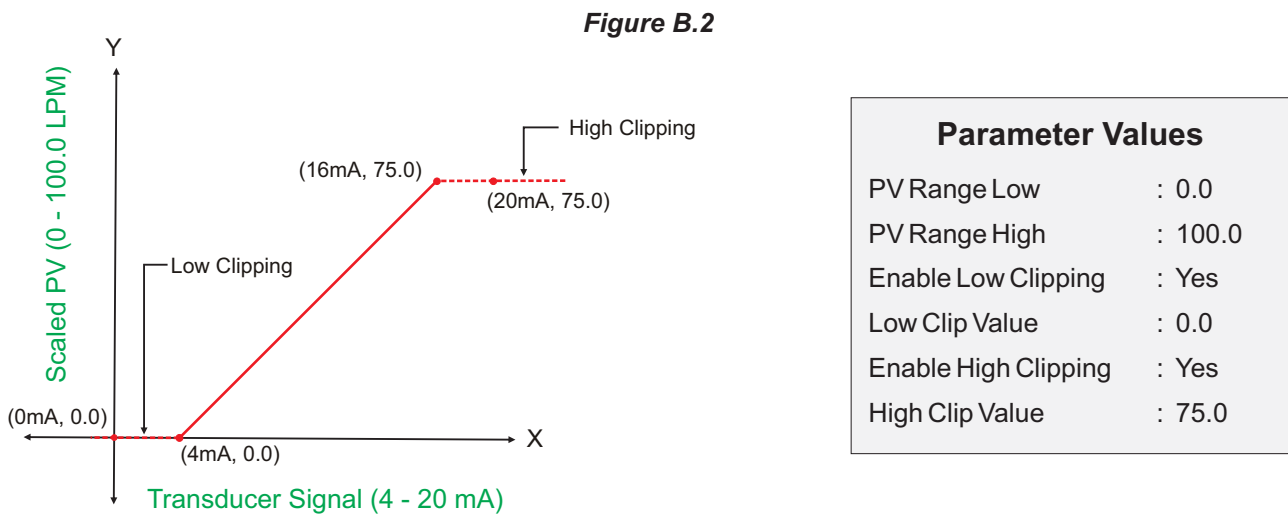
## APPENDIX B LOW / HIGH CLIPPING

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

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



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.





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