UniLog Pro / UniLog Pro Plus with AIS

PPI
The Perfection Experts
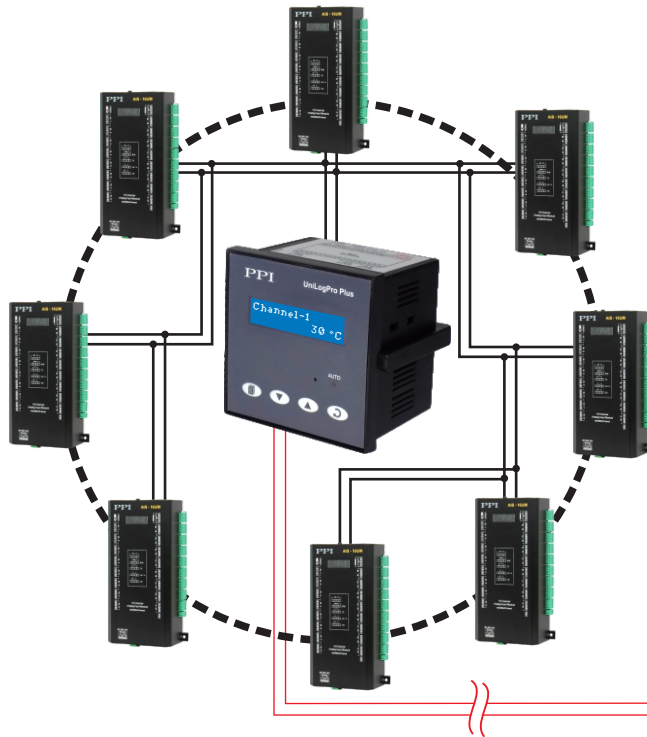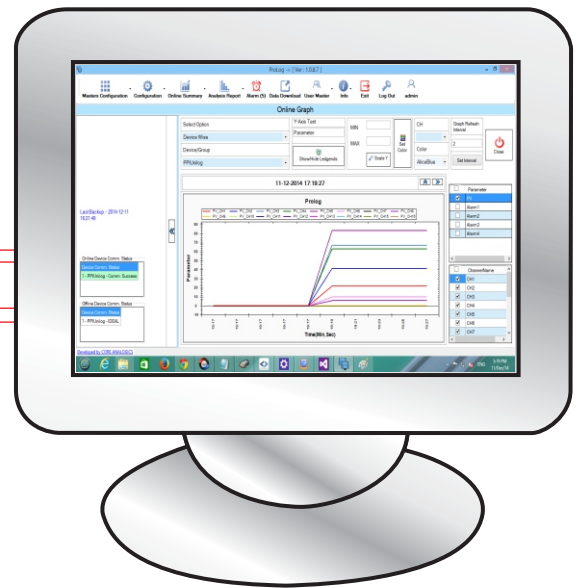
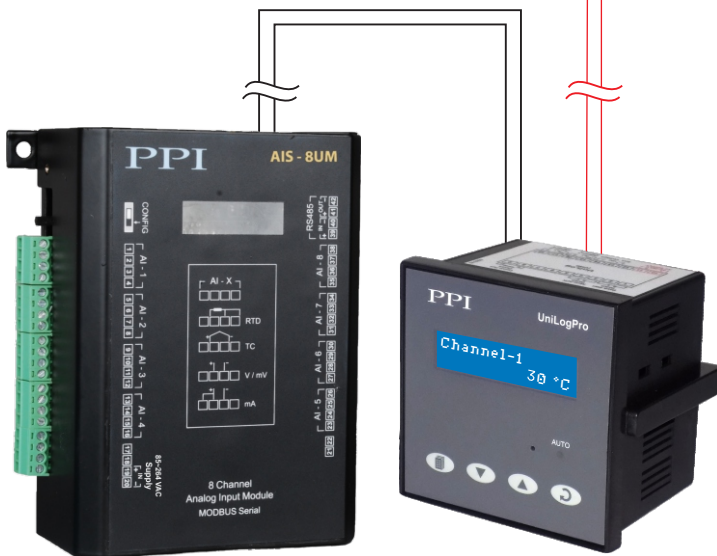## Universal Process Data Recorder PC Software Version

UniLog Pro Plus

8 to 128 Channel
Expandable Version
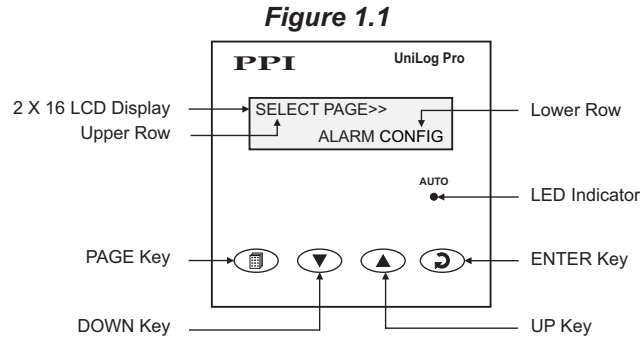
UniLog Pro

Fixed 8/16 Channel

# User Manual

CONTENTS

Section 1
FRONT PANEL : LAYOUT AND OPERATION

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

Figure 1.1

LCD DISPLAY

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

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

Figure 1.2(a)

Boiler Pressure
2.1 PSI

Figure 1.2(b)

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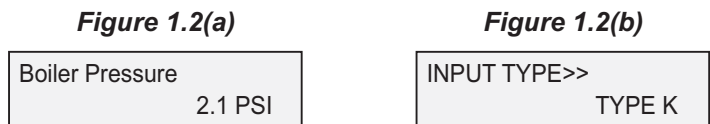
In Set-up Mode, the Upper Row displays the parameter *Name* and the Lower Row displays the corresponding parameter *Value*. Refer Figure 1.2(b) above.

LED INDICATOR
The front panel round LED lamp indicates the channel scan mode. The LED glows ON if the channel scanning is in Auto mode.

KEYS
There are four tactile keys provided on the front panel for setting-up the parameter values and for other functions & commands. The Table 1.1 below lists each key and the associated function.

Table 1.1

Symbol	Key	Function
⊞	PAGE	Press to enter / exit Set-up Mode.
▼	DOWN	Press to decrease the parameter value. Pressing once decreases the value by one count; holding the key pressed speeds up the change.
▲	UP	Press to increase the parameter value. Pressing once increases the value by one count; holding the key pressed speeds up the change.
↺	ENTER	Press to store the set parameter value and to scroll to the next parameter.

Section 2
BASIC OPERATION

POWER-UP

Upon switching on the power to the unit, the display shows model name on the Upper Row and the Version Number on the Lower Row for approximately 4 seconds as shown below.

```
UniLog Pro / UniLog Pro Plus
Version        1.0.1.0
```

After the power-up display sequence, the UniLog Pro / UniLog Pro Plus starts showing the process values for all the channels sequentially. 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 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.
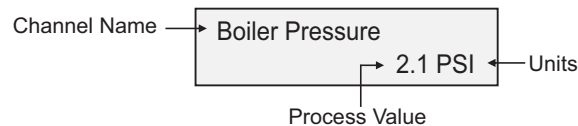
In case of process value error, the Lower Row indicates the type of error in place of process value and units. The various error and the respective causes are listed in Table 2.1.

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
Com. Fail	Communication Link with CIM broken

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 be scrolled using UP and DOWN keys.

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 names for the channels 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 │
└─────────────────────────┘
```

If multiple channels are under Alarm condition; use UP / DOWN keys to scroll through the various 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 relay. Note that acknowledging the Alarm(s) does not remove the Alarm condition(s).

RTC Screen

This is single screen providing 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.

```
┌─────────────────────────┐
│ Date:         16/05/11  │
│ Time:         08:56:00  │
└─────────────────────────┘
```

Section 3
SET-UP MODE : ACCESS AND OPERATION

The UniLog Pro / UniLog Pro Plus requires various user settings that determine how the Recorder will function or operate. These settings are called Parameters.
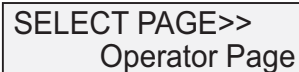
The parameters are always presented in a fixed format : The Upper Row displays the *Parameter Name* and the Lower Row displays the options / set value. The parameters appear in the same sequence as listed in their respective sections.

For convenience and ease of memorizing, the various parameters have been arranged in different groups depending upon the functions the parameters represent. Each group is assigned a unique Page Header for its access.

SET-UP MODE

The Set-up Mode allows the user to view and / or modify the parameter values. Follow the steps below to open a desired Page Header for setting the parameter values.

1. Press and release PAGE key. The Upper Row shows SELECT PAGE and the Lower Row shows the name for the first available Page Header. See Figure below.

<div style="text-align:center; border:1px solid;">
SELECT PAGE>>
Operator Page
</div>

2. Select the desired Page Header name on the Lower Readout using the UP/DOWN keys.

3. Press and release ENTER key. The Upper Row shows the name of the first parameter listed in the selected Page Header and the Lower Row shows its current value.
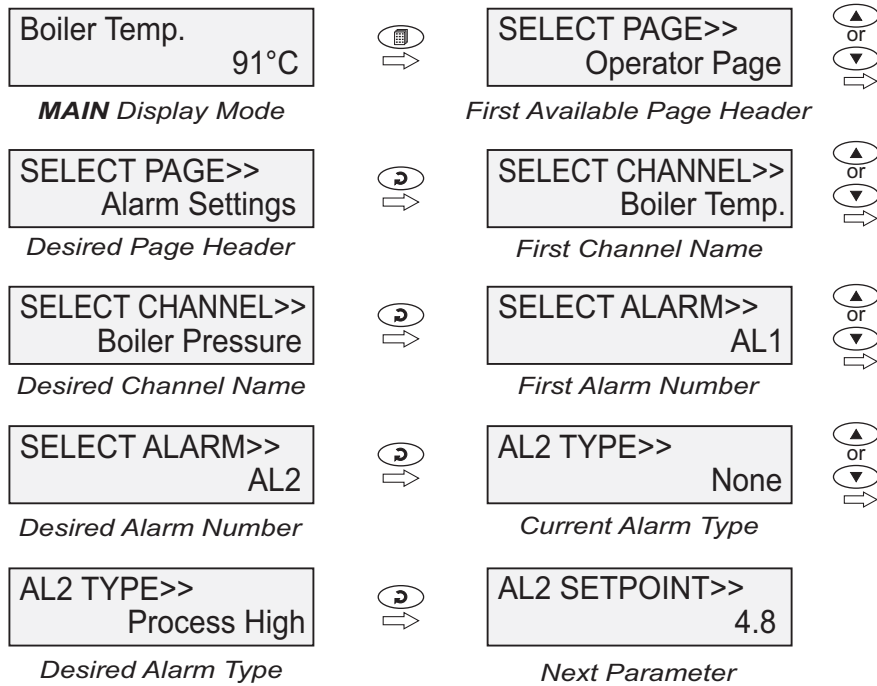
Adjusting Parameter Values

Once a Page Header is accessed; step through the following sequence to adjust the values of the desired parameters.

1. Press and release the ENTER key until the name for the required parameter appears on the Upper Row. The last parameter in the list rolls back to the first parameter.

2. Use UP / DOWN keys to adjust the parameter value.

3. Press and release the ENTER key. The new value gets stored in the non-volatile memory and the next parameter in the list is displayed.

The figure 3.1 below illustrates how to access the desired Page Header and edit the parameter value. The illustration shows the example of altering the Alarm-2 Type from 'None' to 'Process High' for the channel name 'Boiler Pressure'.

Figure 3.1

Boiler Temp. 91°C	⇒	SELECT PAGE>> Operator Page	▲ or ▼ ⇒
MAIN Display Mode		*First Available Page Header*	

SELECT PAGE>> Alarm Settings	⇒	SELECT CHANNEL>> Boiler Temp.	▲ or ▼ ⇒
Desired Page Header		*First Channel Name*	

SELECT CHANNEL>> Boiler Pressure	⇒	SELECT ALARM>> AL1	▲ or ▼ ⇒
Desired Channel Name		*First Alarm Number*	

SELECT ALARM>> AL2	⇒	AL2 TYPE>> None	▲ or ▼ ⇒
Desired Alarm Number		*Current Alarm Type*	

AL2 TYPE>> Process High	⇒	AL2 SETPOINT>> 4.8
Desired Alarm Type		*Next Parameter*

To exit the Set-up Mode and return to the MAIN Dispaly Mode, press and release PAGE key.

Notes :

1. The UniLog Pro / UniLog Pro Plus communicates with the remote Channel Interface Module (CIM) using 2-wire link. If the link is broken or open, the parameter values can only be viewed and can not be set / altered.

2. It is a must to press the ENTER key after altering the value of parameter else the new value will not be registered / stored. That is, a return to the MAIN Display Mode (by depressing PAGE key) without pressing the ENTER key will not store the altered value in the UniLog Pro / UniLog Pro Plus memory and the previous set value will be retained.

3. If the UniLog Pro / UniLog Pro Plus is left in Set-up Mode for more than 30 seconds without any key operation, it automatically exits the Set- up Mode and returns to the MAIN Display Mode.

Section 4
OPERATOR PARAMETERS

The Operator Page contains the parameters that are used most frequently and the commands that are required for day-to-day operation. This page is not locked for editing by Master Lock. The Operator Page parameters are listed below.

Table : 4.1

Parameter Description	Settings
'START' COMMAND FOR BATCH RECORDING BATCH START>> NO *(Available if Batch Recording is selected)* Set to 'Yes' to start recording the data. This is usually issued at the begin of a batch process.	No Yes
'STOP' COMMAND FOR BATCH RECORDING BATCH STOP>> NO *(Available if Batch Recording is selected)* 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 this command to 'Yes' to stop recording the data.	No Yes

Section 5
ALARM SETTINGS

This Page Header presents a list of parameters that define the Alarm function for the selected channel.

Table : 5.1

Parameter Description		Settings (Default Value)
CHANNEL NAME FOR ALARM SETTINGS Select the desired Channel Name whose Alarms parameters are to be set.	SELECT CHANNEL>> Channel-1	User defined or default names for channel-1 to channel-8 / 16
SELECT ALARM Select the desired Alarm Number whose parameters are to be set.	SELECT ALARM>> AL1	AL1, AL2, AL3, AL4 (The actual available options depends on the numbers of Alarms set per channel on Alarm configuration page)
ALARM 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.	AL**1** TYPE>> None	None Process Low Precess High
ALARM SETPOINT *The parameter name depends upon the Alarm selected (AL1 Setpoint, AL2 Setpoint, etc.).* Setpoint Value for 'Process High' or 'Process Low' Alarm.	AL**1** SETPOINT>> 0	Min. to Max. of selected input type range
ALARM 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.	AL**1** HYSTERESIS>> 2	1 to 3000 **or** 0.1 to 3000.0

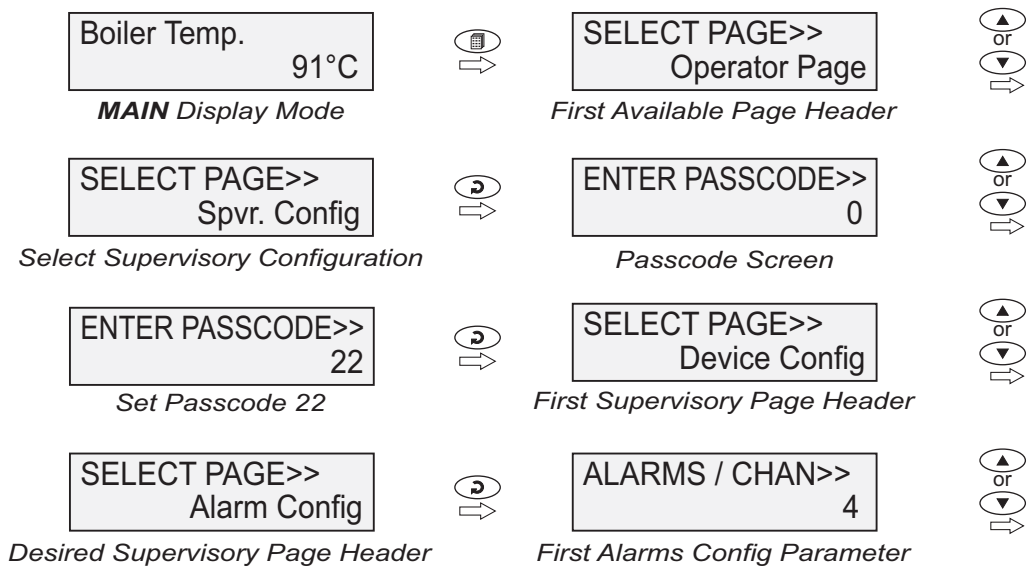| Parameter Description	Settings (Default Value)
ALARM INHIBIT AL**1** INHIBIT>> Yes *The parameter name depends upon the Alarm selected (AL1 Inhibit, AL2 Inhibit, etc.).* **No :** The Alarm activation is suppressed until the PV is within Alarm limits from the time the Recorder is switched ON. **Yes :** The Alarm is not suppressed during the start-up Alarm conditions.	No Yes

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*)

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

Boiler Temp.		SELECT PAGE>>	
91°C		Operator Page	
MAIN *Display Mode*		*First Available Page Header*	
SELECT PAGE>>		ENTER PASSCODE>>	
Spvr. Config		0	
Select Supervisory Configuration		*Passcode Screen*	
ENTER PASSCODE>>		SELECT PAGE>>	
22		Device Config	
Set Passcode 22		*First Supervisory Page Header*	
SELECT PAGE>>		ALARMS / CHAN>>	
Alarm Config		4	
Desired Supervisory Page Header		*First Alarms Config Parameter*	

Section 7

DEVICE CONFIGURATION

Table : 7.1

Parameter Description		Settings (Default Value)
CHANNEL UPDATE TIME IN AUTO SCAN MODE 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.	SCAN RATE>> 3	1 Sec. to 99 Sec. (Default : 3 Sec.)
DEVICE IDENTIFICATION NUMBER This parameter assigns a unique identification number to the UniLog Pro / UniLog Pro Plus which is then used in file naming system for downloading the records to the PC.	RECORDER ID>> 2	1 to127 (Default : 1)
SELECT TOTAL NUMBERS OF CHANNELS The UniLog Pro / UniLog Pro Plus is shipped with either 8 or 16 channel interface module. Set this parameter value accordingly.	TOTAL CHANNELS>> 16	1. 8 2. 16 (Default : 16)
ERASE ALL STORED RECORDS Setting this command to 'Yes', erases all the records stored in the internal Memory.	DELETE RECORDS>> No	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)
SELECT CHANNEL NAME SELECT CHANNEL>> Channel-1 Select the channel name for which the parameter values are to be set.	User defined or default names for channel-1 to channel-8 / 16 (Default : NA)
SKIP CHANNEL FOR DISPLAY SKIP>> No Select to 'Yes' if the selected channel is not to be indicated on display.	No Yes (Default : Yes)
SIGNAL INPUT TYPE INPUT TYPE>> Type K (Cr-Al) Set the type of Thermocouple / RTD / DC Linear signal input type connected to the selected channel.	Refer Table 8.2 (Default : Type K (Cr-Al))
DISPLAY RESOLUTION FOR MEASURED PV RESOLUTION>> 0.1 Unit Set the decimal point position for the PV indication on the display. This is applicable only for DC Linear signal input. The temperature value measured from Thermocouple / RTD is always indicated with 0.1 resolution.	1 Unit 0.1 Unit 0.01 Unit 0.001 Unit (Default : 0.1 Unit)
DISPLAY UNITS FOR MEASURED PV UNITS>> °C Select the Units that shall be displayed along with the measured PV on the display. For temperature input (Thermocouple & RTD), only °C and °F units are available and represent actual converted values. All other units available for DC Linear signal input are for indication purpose only and correspond to the units measured by the transmitter.	Refer Table 8.3 (Default : °C)
RANGE LOW RANGE LOW>> 0 *(Available for DC Linear inputs)* The Range Low value sets the process value corresponding to the minimum DC Linear signal of the selected input type (that is, 0 V or 1V or 0mA or 4mA).	-19999 to 30000 Counts with Selected Resolution (Default : 0.0)

Parameter Description	Settings (Default Value)
RANGE HIGH RANGE HIGH>> 1000 *(Available for DC Linear inputs)* The Range High value sets the process value corresponding to the maximum DC Linear signal of the selected input type (that is, 50mV or 200mV or 1.25V or 5V or 10V or 20mA).	-19999 to 30000 Counts with Selected Resolution (Default : 100.0)
APPLY LOWER CLIP ON DISPLAYED PV LOW CLIPPING>> Disable *(Available for DC Linear inputs)* Setting this parameter to 'Enable' clips the lower Process Value indication to a preset minimum level.	Disable Enable (Default : Disable)
PRESET LOWER CLIP LEVEL LOW CLIP VAL>> 0.0 *(Available if Low Clip enabled)* When Low Clip is enabled; the minimum displayed PV is clipped (restricted) to this parameter value. For example; if Low Clip value is set to 0.0 then all measured values below 0 are displayed as 0.0.	-19999 to 30000 (Default : 0)
APPLY UPPER CLIP ON DISPLAYED PV HIGH CLIPPING>> Disable *(Available for DC Linear inputs)* Setting this parameter to 'Enable' clips the upper Process Value indication to a preset maximum level.	Disable Enable (Default : Disable)
PRESET UPPER CLIP LEVEL HIGH CLIP VAL>> 100.0 *(Available if Low Clip enabled)* When High Clip is enabled; the maximum displayed PV is clipped (restricted) to this parameter value. For example; if High Clip value is set to 100.0 then all measured values above 100 are displayed as 100.0.	-19999 to 30000 (Default : 100.0)
ZERO OFFSET ZERO OFFSET>> 0 This value is algebraically added to the measured PV for removal of any known sensor calibration error.	-1999 / 3000 **or** -1999.9 / 3000.0 (Default : 0)

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/°F **or** 0.1 °C/°F
0 to 20 mA	-19999 to 30000 units	1 0.1 0.01 0.001 units
4 to 20 mA		
0 to 50 mV		
0 to 200 mV		
0 to 1.25 V		
0 to 5 V		
0 to 10 V		
1 to 5 V		

Table 8.3

Option	Description
°C	Degree Centigrade
°F	Degree Fahrenheit
(none)	No Unit (Blank)
°K	Degree Kelvin
EU	Engineering Units
%	Percentage
Pa	Pascals
Mpa	Mpascals
kPa	Kpascals
bar	Bar
mbar	Milli bar
psi	PSI
kg/sq.cm	kg/cm²
mmH2O	mm water gauge
inH2O	Inches water gauge
mmHg	mm mercury
Torr	Torr
litre/hr	Litres per hour
litre/min	Litres per minute
%RH	% Relative Humidity
%O2	% Oxygen
%CO2	% Carbon di-oxide
%CP	% Carbon Potential
V	Volts
A	Amps

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

Section 9
ALARM CONFIGURATION

The parameters presented on this page allow configuration of the number of Alarms per channel and Alarm output functions. Relay-1 is a common output for Alarm-1 Ored Alarm-3 of all channels. Relay-2 is a common output for Alarm-2 Ored Alarm-4 of all channels.

Table : 9.1

Parameter Description		Settings (Default Value)
ALARMS PER CHANNEL The UniLog Pro / UniLog Pro Plus 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.	ALARMS / CHAN >> 4	1 to 4 (Default : 4)
RELAY-1 LOGIC **RELAY-2 LOGIC** **Normal :** The Relay remains ON under Alarm condition; OFF otherwise. Useful for activating Audio / Visual Alarm. **Reverse :** The Relay remains OFF under Alarm condition; ON otherwise. Useful for Tripping the system under monitoring.	RELAY-1 LOGIC >> Normal RELAY-2 LOGIC >> Normal	Normal Reverse (Default : Normal)

Section 10
RECORDER CONFIGURATION

Table : 10.1

Parameter Description		Settings (Default Value)
NORMAL RECORDING INTERVAL	NORMAL INTERVAL>> 0:00:30	0:00:00 (H:MM:SS) to 2:30:00 (H:MM:SS) (Default : 0:00:30)
The UniLog Pro / UniLog Pro Plus 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.		
ZOOM RECORDING INTERVAL	ZOOM INTERVAL>> 0:00:01	0:00:00 (H:MM:SS) to 2:30:00 (H:MM:SS) (Default : 0:00:01)
The UniLog Pro / UniLog Pro Plus 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.		
RECORD GENERATION ON ALARM STATUS TOGGLE	ALARM TOGGLE REC Disable	Disable Enable (Default : Enable)
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).		
SELECT RECORDING MODE	RECORDING MODE>> Continuous	Continuous Batch (Default : Continuous)
Continuous The UniLog Pro / UniLog Pro Plus keeps generating records indefinitely. There are no Start / Stop commands. Suitable for continuous processes. **Batch** The UniLog Pro / UniLog Pro Plus 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.		
TIME INTERVAL FOR BATCH RECORDING *(Available for Batch Recording Mode)*	BATCH TIME>> 1.00	0:01 (HH:MM) to 250:00 (HHH:MM) (Default : 1:00)
Sets the time period in Hours:Minutes for which the recording to take place from the time the Start command is issued.		

Section 11
RTC SETTING

Table : 11.1

Parameter Description		Settings
SET CLOCK TIME (HH:MM) Set current clock time in Hrs:Min (24 Hours format).	TIME (HH:MM)>> 15:53	0.0 to 23:59
SET CALENDAR DATE Set current calendar date.	DATE>> 23	1 to 31
SET CALENDAR MONTH Set current calendar month.	MONTH>> 11	1 to 12
SET CALENDAR YEAR Set current calendar year.	YEAR>> 2011	2000 to 2099

Section 12
UTILITIES

Table : 12.1

Parameter Description		Settings
MASTER LOCK ENABLE DISABLE	LOCK>> No UNLOCK>> No This parameter allows locking and unlocking of Alarm Setting parameters. Locking the parameters inhibits editing (modifying) of Alarm parameters to prevent any inadvertent changes by the operator. The Parameters 'Lock' and 'Unlock' are mutually exclusive.	No Yes
UIM DEFAULT	UIM DEFAULT>> No Setting this command to 'Yes' resets all the recording related parameters to their default values. All the user set Channel Names are also reset to the default names (Channel-1, Channel-2, etc.).	No Yes
CIM DEFAULT	CIM DEFAULT>> No Setting this command to 'Yes' resets all the Channel-configuration and Alarm related parameters to their default values.	No Yes
MAKE CIM & UIM COMPATIBLE	CPY CIM TO UIM>> No CPY UIM TO CIM>> No The Channel-configuration and Alarm related parameters that are set via UIM are stored both in UIM & CIM memory. For any reason if either of the units is to be replaced; one of the copy commands can be used to make the changed pair compatible without the need of re-programming all the parameter values. Use 'CPY CIM TO UIM' if a User Interface Module (UIM) is replaced. Use 'CPY UIM TO CIM' if a Channel Interface Module (CIM) is replaced.	No Yes

Section 13
MOUNTING & ELECTRICAL CONNECTIONS
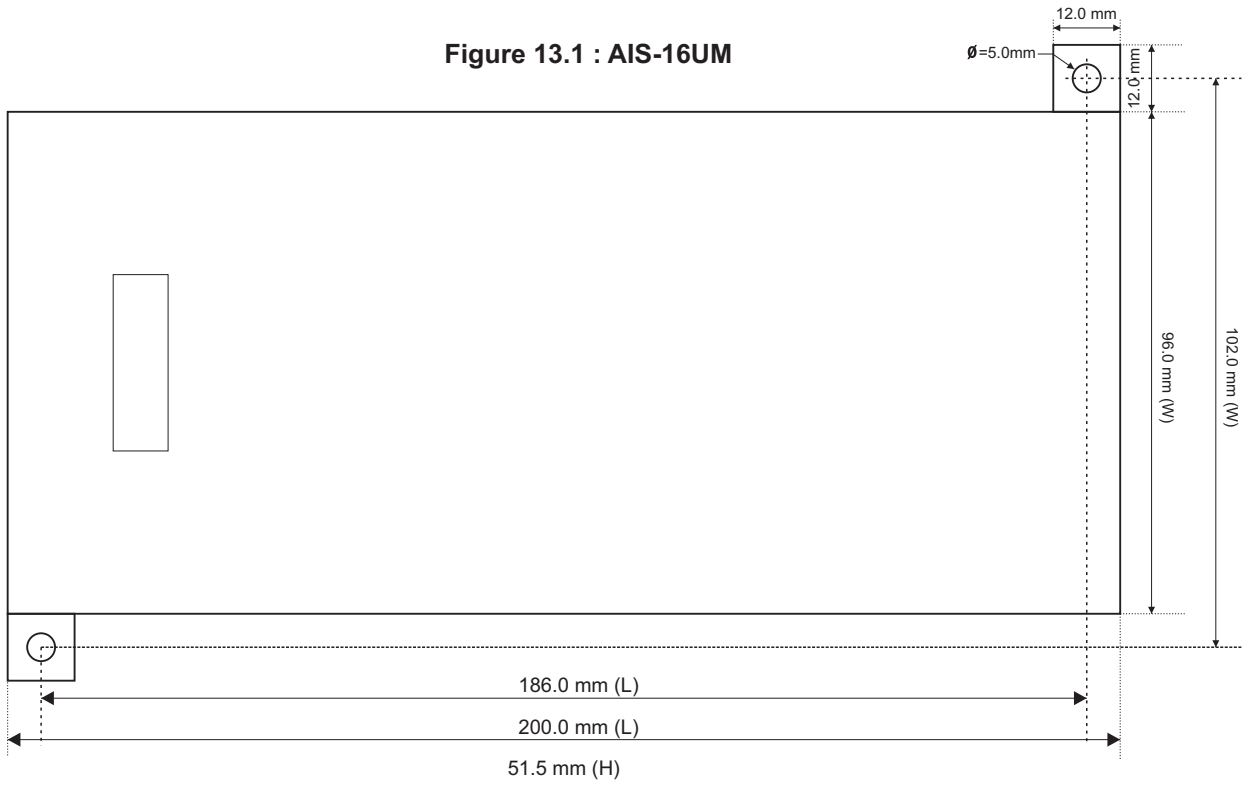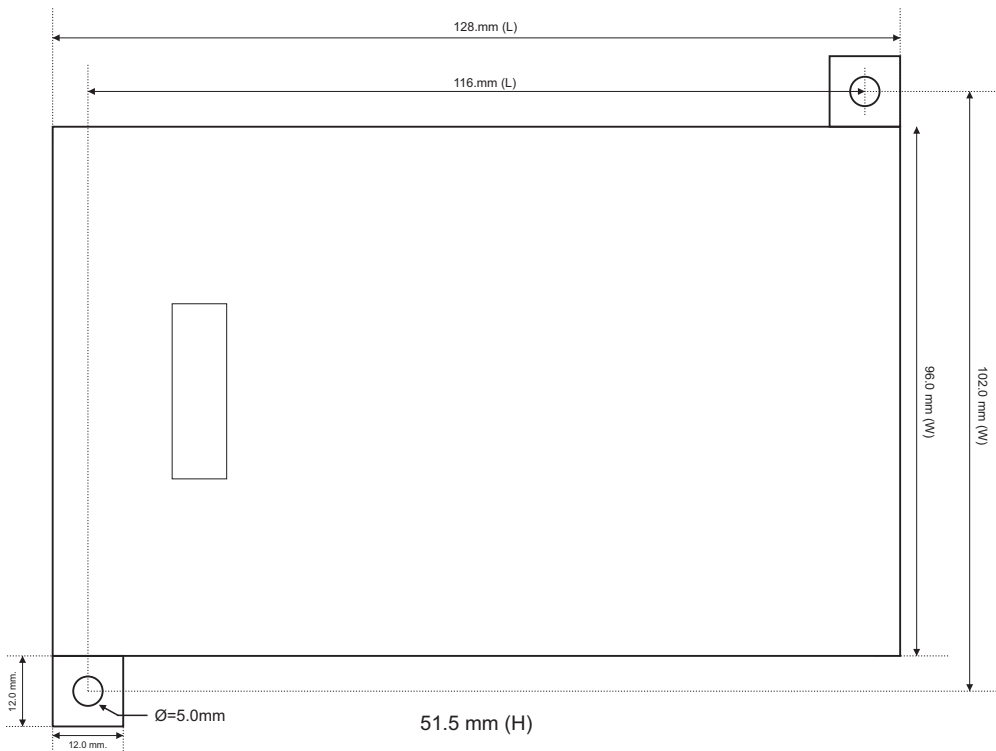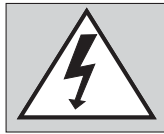
Mounting

Figure 13.1 : AIS-16UM

12.0 mm

Ø=5.0mm

12.0 mm

96.0 mm (W)

102.0 mm (W)

186.0 mm (L)

200.0 mm (L)

51.5 mm (H)

Figure 13.2: AIS-8UM

128.mm (L)

116.mm (L)

12.0 mm

96.0 mm (W)

102.0 mm (W)

12.0 mm.

Ø=5.0mm

12.0 mm.

51.5 mm (H)

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.

USER INTERFACE MODULE (UIM) : CONNECTION DIAGRAM

The Electrical Connection Diagram is shown on the Top Side of the enclosure. The diagram shows the terminals viewed from the REAR SIDE with the front label upright. The terminal numbers are also embossed on the rear side of the enclosure. Refer figure 13.3.
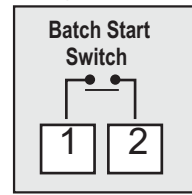
Figure 13.3
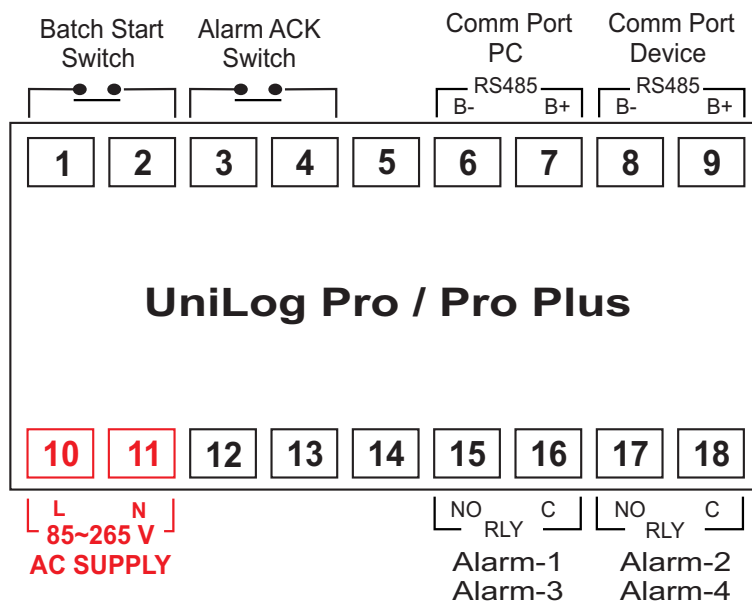
DIGITAL INPUT FOR BATCH START COMMAND

Connect a remote potential-free contact closure switch for the purpose of issuing the Batch - Recording START command. An 'OPEN' to 'CLOSE' change over of the contacts initiates time based batch recording. Once the recording starts, the change in the contact status has no effect.
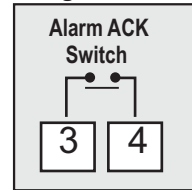
Figure 13.4

Batch Start Switch

| 1 | 2 |

DIGITAL INPUT FOR ALARM ACKNOWLEDGE

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

Figure 13.5

Alarm ACK Switch

| 3 | 4 |

ALARM - 1 / ALARM - 3 COMMON RELAY OUTPUT

This relay output status is determined by logically Oring the Alarm-1 and Alarm-3 status of all the channels. Potential-free Relay changeover contacts NO (Normally Open) and C (Common) rated 2A/240 VAC (resistive load) are provided as Relay output.
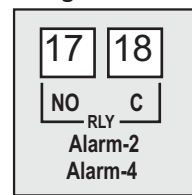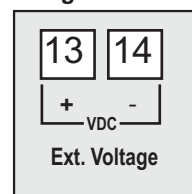
Figure 13.6

| 15 | 16 |

NO RLY C

Alarm-1 Alarm-3
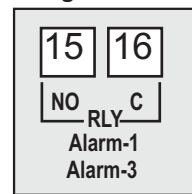
ALARM - 2 / ALARM - 4 COMMON RELAY OUTPUT

This relay output status is determined by logically Oring the Alarm-2 and Alarm-4 status of all the channels. Potential-free Relay changeover contacts NO (Normally Open) and C (Common) rated 2A/240 VAC (resistive load) are provided as Relay output.

Figure 13.7

| 17 | 18 |

NO RLY C

Alarm-2 Alarm-4

EXCITATION VOLTAGE OUTPUT

12 VDC is available only for buzzer. Connect (+) to terminal 13 and (-) to terminal 14.

Figure 13.8

| 13 | 14 |

+ VDC -

Ext. Voltage

POWER SUPPLY

Figure 13.9
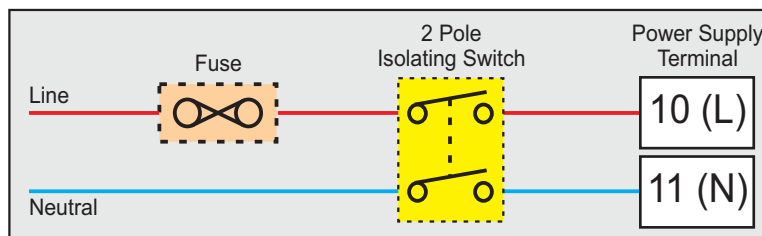
As standard, the recorder is supplied with power connections suited for 85 to 264 VAC line supply. Use well-insulated copper conductor wire of the size not smaller than 0.5mm² for power supply connections. Connect Line (Phase) supply line to terminal 10 and the Neutral (Return) supply line to terminal 11 as shown in Figure 13.9. The recorder is not provided with fuse and power switch. If necessary, mount them separately. Use a time lag fuse rated 1A @ 240 VAC.
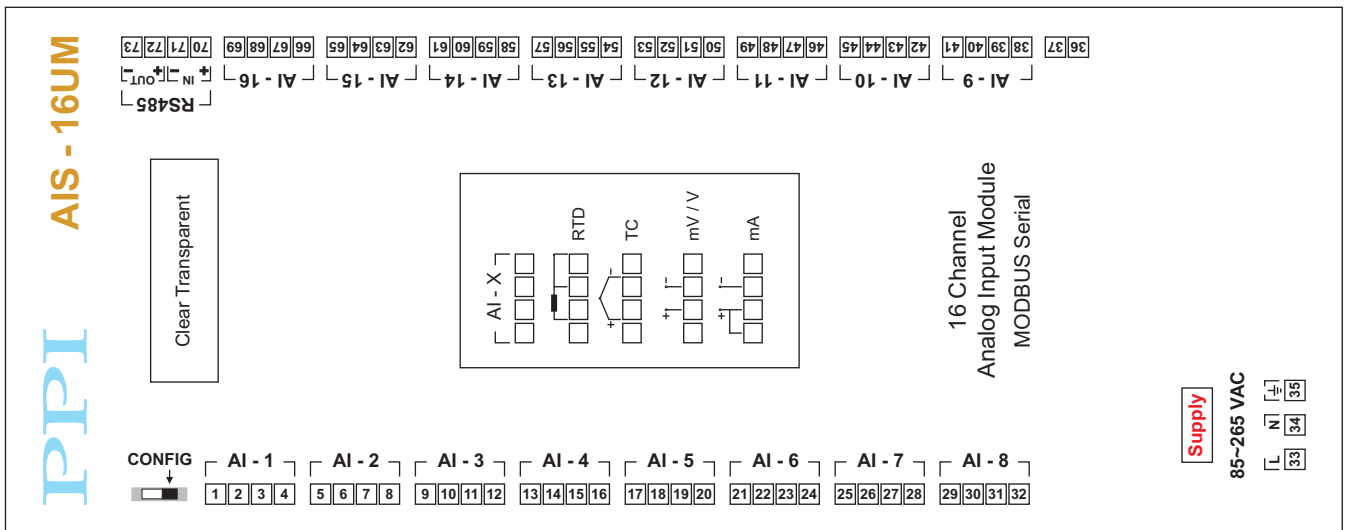
ANALOG INTERFACE MODULE (AIS) : CONNECTION DIAGRAM

The Electrical Connection Diagram is shown right above the terminals. The figure 13.10(a) : **AIS-8UM**, figure 13.10(b) : **AIS-16UM** shows illustrates the terminal positions on the Left, Right and Top sides of the AIS.

### Figure 13.10(a) : AIS-8UM
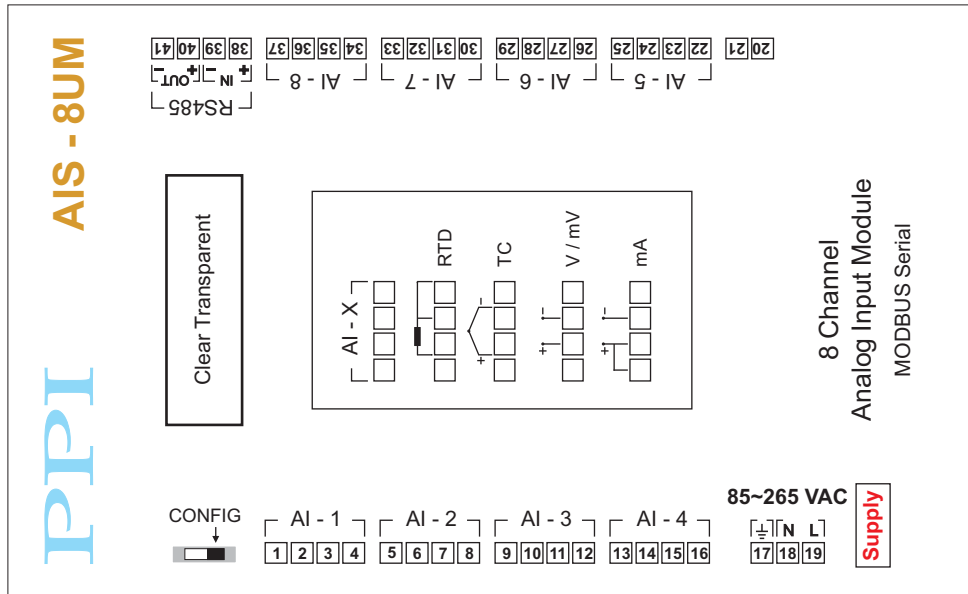
Figure 13.10(b) : AIS-16UM

Input Channels (1 to 8 OR 1 to 16)

Each of the 8 or 16 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 13.11(a)**. Use the correct type of Thermocouple extension lead wires or compensating cable for the entire distance ensuring the correct polarity throughout. Avoid joints in the cable.
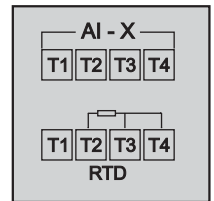
Figure 13.11(a)
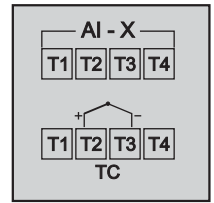
RTD Pt100, 3-wire

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 13.11(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.
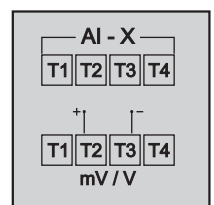
Figure 13.11(b)

DC Linear Voltage (mV / V)

Use a shielded twisted pair with the shield grounded at the signal source for connecting mA / mV / V source. Connect common (-) to terminal T3 and the signal (+) to terminal T2, as shown in **Figure 13.11(c).**
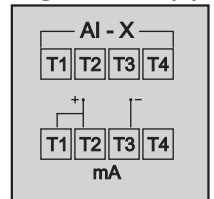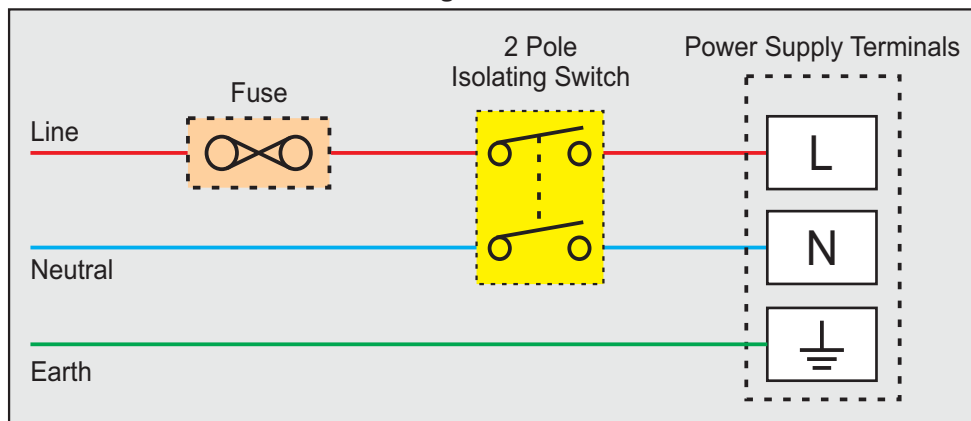
Figure 13.11(c)

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 13.11(d).**

Figure 13.11(d)

POWER SUPPLY

Figure 13.12

As standard, the module is supplied with power connections suited for 85 to 264 VAC line supply. Use well-insulated copper conductor wire of the size not smaller than 0.5mm² for power supply connections ensuring proper polarity as shown in Figure 13.12. The module is not provided with fuse and power switch. If necessary, mount them separately. Use a time lag fuse rated 1A @ 240 VAC.

Section 14

CONFIGURING COMMUNICATION PARAMETERS

The Module (Analog Interface Module) supports industry standard **MODBUS RTU over Serial** Protocol for communicating Process Values, Alarm Status & Operation Parameters for various Channels.

The Serial Communication Port specification are shown in Table 14.1 below.

Table 14.1

Port	RS485, 2-wire, Half duplex, Start-stop synchronized	
Protocol	Modbus RTU	
Communication Parameters	**Parameter**	**Settings**
	Slave ID	1 to 248
	Baud Rate	2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
	Parity	None (1 or 2 Stop Bits) Even (1 Stop Bit) odd (1 Stop Bit)
Max. No. of Units per Loop	31	
Maximum Distance	1200 Meters	

The Module is shipped from the factory with the following default values for the Communication Parameters.

Slave ID **:** 1	Baud Rate : 9600 bps	Parity : Even

The above parameters can be altered to match with the Host (Master) parameters by putting the Module in **Configuration Mode**. In this mode the Module always communicates with the host with the default communication parameter values regardless of the actual set values. The user set values are applicable only when the Module is put back in the **Normal Operation Mode**.

A Slide Switch is provided on the Module, as shown in the Figure 14.1, to select between the Configuration and Normal Operation modes. The Table 14.2 shows the Switch Position and the respective mode.

It is important to note that the switch position is detected only upon power-up. Select the desired Mode while the Module is OFF. That is changing the switch position while the Module is powered does not have any effect on the Mode.

Figure 14.1

Mode Indicator

Slide Switch for
Configuration Mode
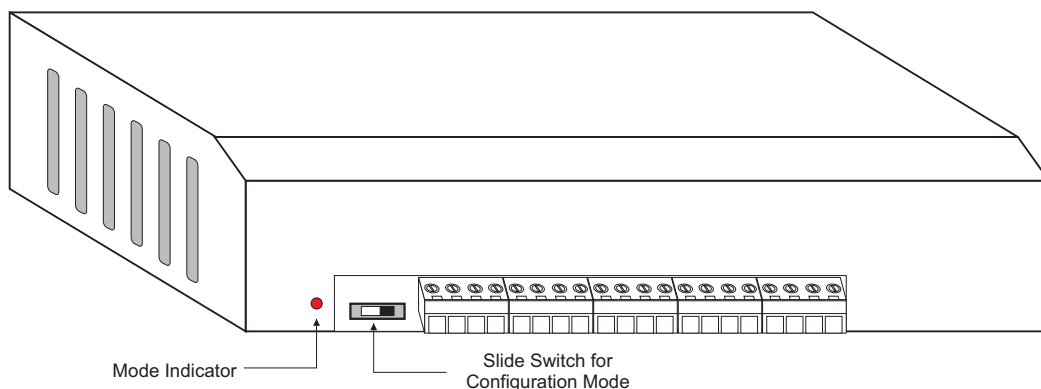
Table 14.2

Slide Switch Position	Mode Indicator	Operation Mode	Communication Parameter Values
 ▣■□ Switch positioned to Left	OFF	Normal	User Set values for *Module Slave ID, Baud Rate* & *Parity*
 ▣□■ Switch positioned to Right	ON	Configuration	*Module Slave ID : 1* *Baud Rate : 9600* *Parity : Even*

The Communication Parameters values can be altered by using the MODBUS RTU protocol while the Module is in Configuration Mode. Set the host (Master) Baud Rate to "9600 bps" and Parity to "Even". The MODBUS Addresses and Settings for the Module communication parameters are listed in the Table 14.3 below.
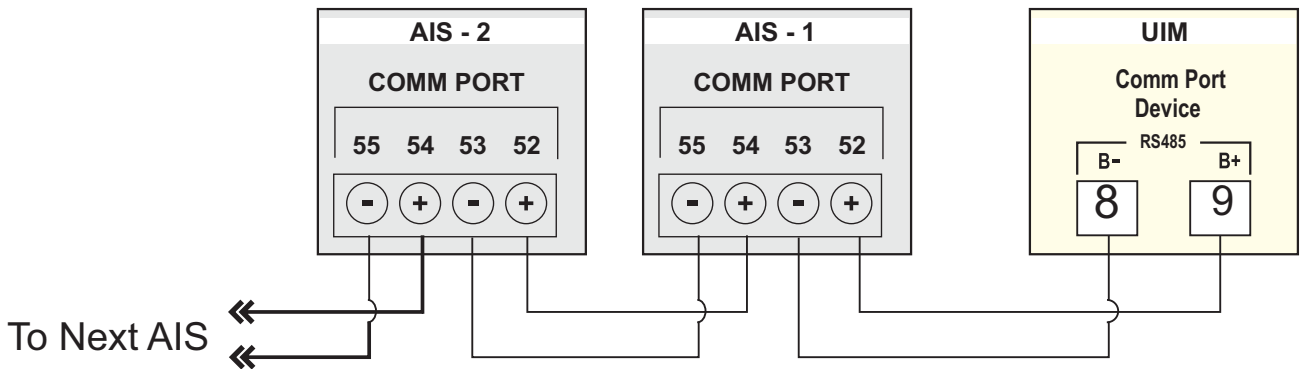
Table 14.3

Parameter Description	Address	Settings (Default Value)
Module Slave ID Unique numeric value assigned to the indicator for identification by the host. Set the value as required by the host.	1	1 to 248 (Default : 1)
Baud Rate Communication speed in 'Bits per Second'. Set the value to match with the host baud rate.	2	<table><tr><td>**Value**</td><td>**Baud Rate**</td></tr><tr><td>0</td><td>2400 bps</td></tr><tr><td>1</td><td>4800 bps</td></tr><tr><td>2</td><td>9600 bps</td></tr><tr><td>3</td><td>19200 bps</td></tr><tr><td>4</td><td>38400 bps</td></tr><tr><td>5</td><td>57600 bps</td></tr><tr><td>6</td><td>115200 bps</td></tr></table> (Default : 9600 bps)
Parity One of the communication error trapping features. Set the data packet parity as implemented by the host protocol.	3	<table><tr><td>**Value**</td><td>**Parity**</td></tr><tr><td>0</td><td>None</td></tr><tr><td>1</td><td>Even</td></tr><tr><td>2</td><td>Odd</td></tr></table> (Default : Even)

Section 15
COMMUNICATION PORT FOR INTERFACING WITH AIS

Applicable only for **UNILOG PRO PLUS**

Figure 15.1

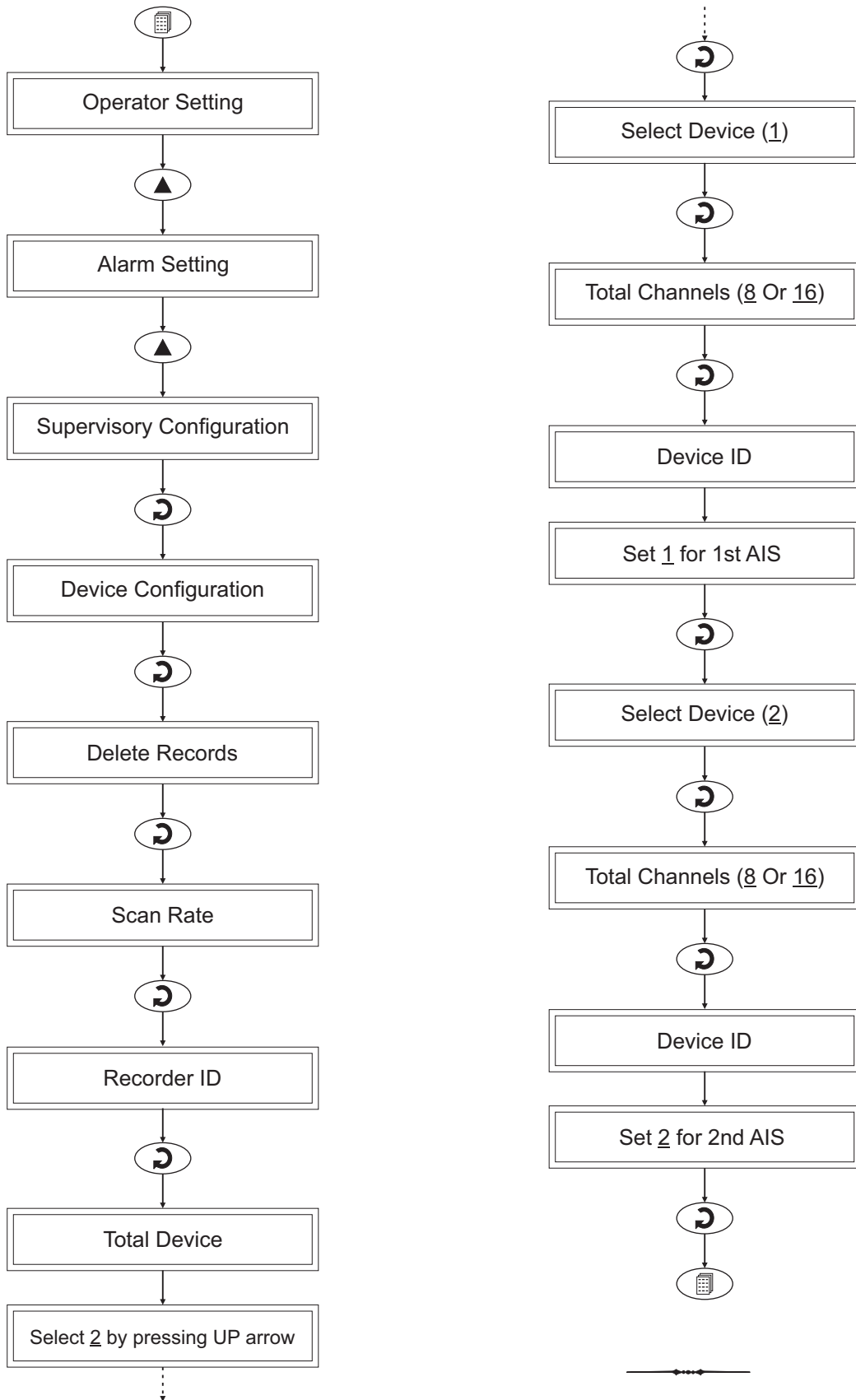| AIS - 2	AIS - 1	UIM
COMM PORT	**COMM PORT**	**Comm Port Device**
55 54 53 52	55 54 53 52	RS485 B- B+
(-)(+)(-)(+)	(-)(+)(-)(+)	8 9

To Next AIS

The UIM is connected to 1 or more AIS using RS485 Serial Communication Port. The wiring connections for interfacing the UIM with AIS is shown in the figure 15.1.

For reliable noise free communication, use a pair of twisted wires inside screened cable. The wire should have less than 100 ohms / km nominal DC resistance (Typically 24 AWG or thicker).

Section 15.1
ID SETTING FOR MORE THAN 1 AIS
Applicable only for **UNILOG PRO PLUS**

Operator Setting

Alarm Setting

Supervisory Configuration

Device Configuration

Delete Records

Scan Rate

Recorder ID

Total Device

Select 2 by pressing UP arrow

Select Device (1)

Total Channels (8 Or 16)

Device ID

Set 1 for 1st AIS

Select Device (2)

Total Channels (8 Or 16)

Device ID

Set 2 for 2nd AIS

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