ETN SERIES

Enviro Technologies New Series product

USER MANUAL

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Introduction

A ETN SERIES DEVICE is microcontroller based electronic system which is specially design for measuring Differential pressure, with Temperature and Humidity as per required by user. Configuration of device as per user requirement.

Device has TFT displays to show all its parameter data and process value which is easily readable form long distance. Device has inbuilt buzzer for any alarm and memory limit violation which is configurable. 4 key for setting user define device parameter. Device can store all its data in his memory which can be letter downloaded from PC software at any time.

Device also has provision for external parallel display device which can be mounted away from main device for monitoring (As per user requirement).

Applications:-

- Pharmaceutical industry
- Room Monitoring System for HVAC
- Clean Room Mapping

Specification and features

Sr. No.	Specifications		Description
1	Channel No.	**:**	3 Channel 1. Inbuilt/External Differential pressure sensor **(Factory Settable)** 2. Inbuilt/External Temperature Sensor **(Factory Settable)** 3. Inbuilt/External Humidity Sensor **(Factory Settable)**
2	Channel Input Type	**:**	**Channel 1(Factory Settable)** 1. Inbuilt Differential Pressure sensor range (factory settable) 2. External differential sensor input (0 to 5Vmax), 0mA to 20mA, 4mA to 20mA **Channel 2 (Factory Settable)** 1. Inbuilt Temperature Sensor range 0.0 °C to 100.0 °C 2. External Temperature PT-100 sensor range -90.0°C to 390.0°C 3. External Temperature sensor input 0 to 5Vmax, 0mA to 20mA, 4mA to 20mA (Range depends on Sensor) 4. RS-485 based sensor. **Channel 3 (Factory Settable)** 1. Inbuilt Humidity Sensor range 0.0 to 100.0% RH 2. External Humidity 0.0 to 100.0% RH 3. External Humidity sensor input 0 to 5Vmax, 0mA to 20mA, 4mA to 20mA (Range depends on Sensor) 4. RS-485 based sensor.
3	Channel Output Type	**:**	**Channel 1(Factory Settable)** 1. Inbuilt Differential Pressure sensor range (factory settable) with 4mA to 20mA out. **Channel 2 (Factory Settable)** 2. Temperature Sensor range (factory settable) with 4-20mA output. **Channel 3 (Factory Settable)** 3. Humidity Sensor range (factory settable) with 4-20mA output.

3	Channel Accuracy/Resolution	**:**	**Channel 1** **1. Accuracy:-** 1. Inbuilt Differential Pressure sensor accuracy 3% of Full Scale. 2. External differential pressure sensor accuracy depends on range and sensor. 3. Differential pressure 4-20mAmp output accuracy +/-50uA with 500ohm load). **2. Resolution:-** 1. Inbuilt Differential Pressure sensor resolution 1 Pascal / 0.1mmWC 2. External differential sensor resolution depends on range and sensor resolution. **Channel 2** **1. Accuracy:-** 1. For Inbuilt Temperature sensor accuracy 0.3°C. 2. For External PT-100 sensor accuracy +/- 0.3°C for other sensor it is depend on sensor. 3. Temperature 4-20mAmp output accuracy +/-50uA with 500ohm load. **2. Resolution:-** For Inbuilt Temperature sensor resolution 0.1°C. For External PT-100 Sensor resolution 0.1°C. **Channel 3** **1. Accuracy:-** 1. For Inbuilt Humidity sensor accuracy 3% RH. 2. For External Humidity sensor accuracy is depends on sensor. 3. Humidity 4-20mA output accuracy +/- 50uA with 500ohm load. **2. Resolution:-** For Inbuilt Humidity sensor resolution 0.1 % RH. For External Humidity sensor resolution is depends on sensor.
4	Digital Input	**:**	Digital input can be configured for Acknowledgement or Door input status with event or as digital sensor input.
5	Relay	**:**	Configurable Potential free relay output with rating for 120VAC with 1Amp and 24VDC 1Amp. (User define NO/NC jumper setting)
6	Inbuilt Buzzer	**:**	Multifunction Configurable inbuilt buzzer with mute option.

7	Time and Date	**:**	Display Real Time Clock.
8	Communication	**:**	RS-485 Communication.
9	External Slave Display	**:**	External Slave monitoring display with RS-485 Communication. **(Optional)**
10	Air Nozzles	**:**	2 Air nozzles for differential pressure measurement with standard ¼ inch air pipe fitting. Provision of front air nozzle. (Factory settable connectivity)
11	Enclosure	**:**	Flush mount, with front SS304 Material, and back MS powder coated.
12	Device Fitting	:	Flush mount fitting.
13	Device Rating	:	24VDC, 100mAmp.
14	Operating Temperature	**:**	0°C to 50°C
15	Size	**:**	210mm X 210mm plate dimension, Device depth 32mm and Size: - 150mm X 170mm back cabinet.
Sr. No.	**Feature**		**Description**
1	Type	**:**	Microcontroller based Electronic device with DP, Humidity and Temperature monitoring and logging, configurable digital input, potential free relay output.
2	Display	**:**	TFT Display
3	Keypad	**:**	4 menu operated tactile switch/touch keypad
4	LED indicator	**:**	Tx/Rx communication
5	Device ID	**:**	Device ID can be selected from 1 up to 128.
6	Logging Interval	**:**	Logging Interval from 1min to 255min. **(Default 1min)**
7	Storage Capacity	**:**	Up to 10000 Transaction with 3 channel information.
8	Unit selection	**:**	Unit can be selected for temperature and pressure.
9	Alarm setting	**:**	Set Value, Alarm band setting, Upper, Lower, sensor fails and both alarm.

10	Channel Alarm Event Storage	**:**	Device can store Alarm event of channel Alarm band cross and Alarm band recover event with time stamp.
11	Relay	**:**	Multifunction Configurable potential free relay output for different channel and alarm.
12	Buzzer	**:**	Multifunction Configuration Inbuilt buzzer for different alarm.
13	Min/Max Reading	**:**	Channel Min and Max process value can be view through menu with reset option.
14	Digital Input	**:**	Digital input can be configured for Acknowledgement Or Door input status. Acknowledgement and door detection event can be store with time stamps.
15	Admin / Calibration login	**:**	Password protected Admin and Calibration parameter.
16	Communication	**:**	Proprietary protocol used for communication through RS485 or through TCP-IP (with TCP-IP convertor).
17	Slave Display	**:**	Slave display can be connected for external monitoring display.(Factory settable As per order)

1. ALARM INDICAITON		
• **HI**	**:**	Upper Alarm(Channel 1)
• **LO**	**:**	Lower Alarm(Channel 1)
2. UNIT INDICATION		
• **°C**	**:**	Degree Centigrade
• **°F**	**:**	Degree Fahrenheit
• **%RH**	**:**	Humidity
• **Pa**	**:**	Pascal
• **MmWC**	**:**	Millimeter of water
3. PC COMMUNICAITON INDICATION		
• **Tx / Rx**	**:**	Transmit / Received

Keypad Functions:

There are four operation keys used and there description as follows:

KEY	*Description*
SEL	• To enter into main Menu. • Press this key two times to exit from main menu. • This key used for exit from parameter setting.
INC	• To Scroll the menu parameter • Increments numerical data for parameter setting. • To fast increment press key for 3 sec it will increment automatically by one, • Further pressing of key for 8-10 sec will increment count by 10. • If Key pressed for more than 3 sec in channel display mode then Channel Maximum value will get displayed.
DEC	• Scroll the menu parameter • Decrements numerical data for parameter setting. • To fast decrement press key for 5 sec it will decrement automatically by one, further pressing of key will decrement count by 10. • If Key pressed for more than 3 sec in channel display mode then Channel Maximum value will get displayed.
ENTER	• To enter into menu or parameter. • To set selected values • To take alarm acknowledgement from key while in process value display.

Display Modes:

There are following Display modes available in DPMS:-

1) User Menu Display mode.
2) Special Key Function Display Mode.

Details of Display modes:

1>User Menu Display mode

- This mode is accessed using Admin or Calibration login.
- User can navigate through different User menus to Enable/Disable different Functionality.

2>Special Key Function Display Mode.

- Special Key Functionality only accessed in Channel Display mode
- Following are Special Key Function:
  - ❖ Channel minimum and maximum value display
    - ➢ Channel minimum value displayed by pressing Decrement key more than 3 seconds. In this case displayed channel Minimum value gets displayed.
    - ➢ Channel maximum value displayed by pressing Increment key more than 3 seconds. In this case displayed channel Minimum value gets displayed.
  - ❖ Channel alarm acknowledgment
    - ➢ If ENTER key pressed more than 3 seconds then Acknowledgment of alarm channel taken.

Channel Alarm Types

- Alarm for particular channel set via two parameter as follows :
    - Set point
    - Hysteresis Band
- Depending upon Alarm Parameter setting and Channel Reading following Alarm Condition can be occurred.

SR. No.	Alarm Type	Description
1	High	When Channel reading goes beyond Alarm Set Point + Hysteresis
2	Low	When Channel reading goes below Alarm Set Point + Hysteresis
3	ORNG(over range)	When Channel reading goes beyond Channel Sensor range
4	URNG(under range)	When Channel reading goes below Channel Sensor range
5	OPEN	When Sensor get open(Disconnected from unit)

Alarm Concept with Example:

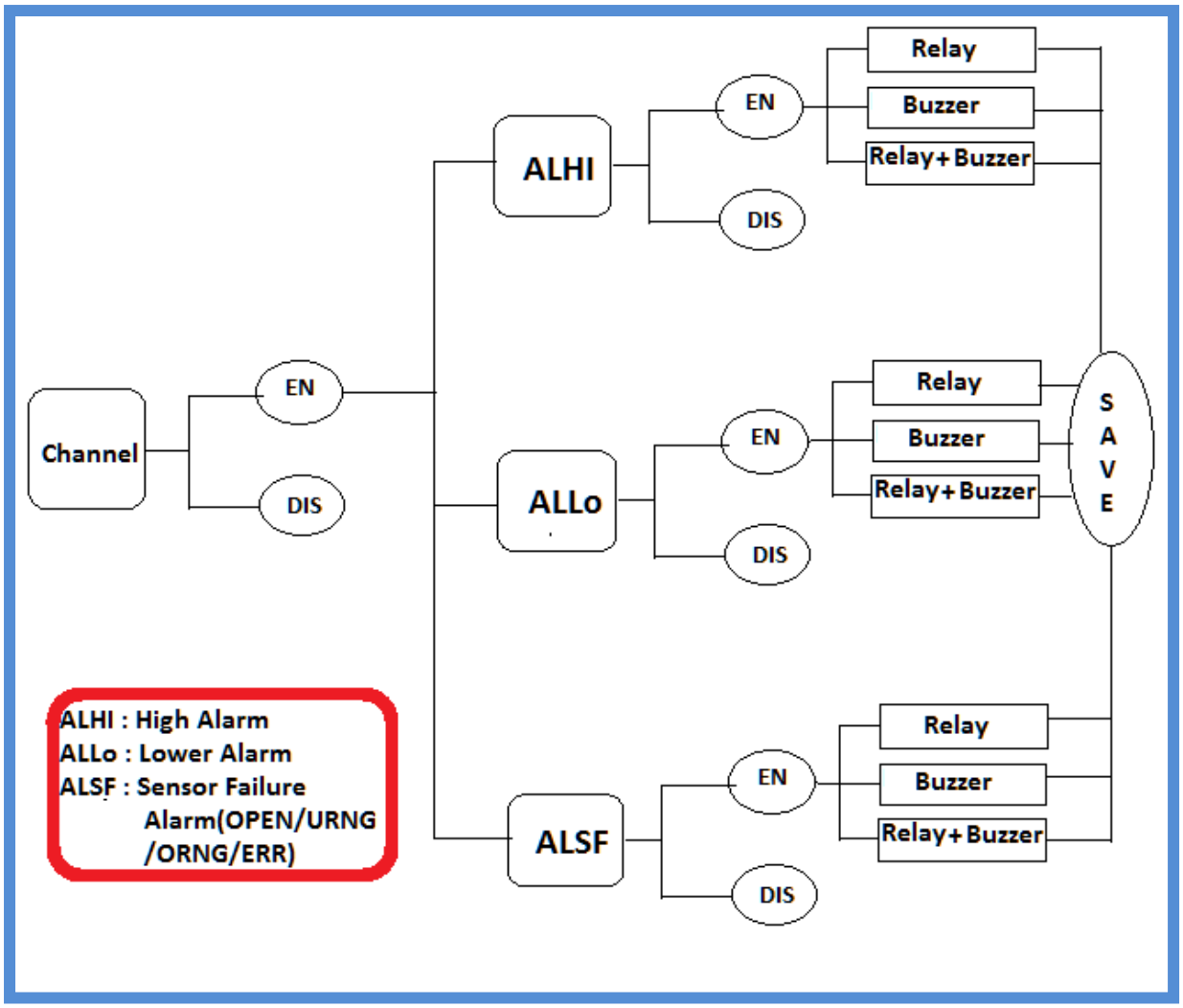
SR. NO.	Set Point	Hysteresis	Channel Process Value	Alarm Raised
1	30.0 °C	5.0 °C	32.5 °C	No Alarm(Normal Condition)
2	30.0 °C	5.0 °C	37.2 °C	High Alarm(Process value goes beyond 30.0 °C + 5.0°C)
3	30.0 °C	5.0 °C	22.3 °C	Low Alarm(Process value goes Below 30.0 °C - 5.0°C)
4	30.0 °C	5.0 °C	Lower than 0°C	Under range Alarm(Process value goes Below 30.0 °C - 5.0°C)
5	30.0 °C	5.0 °C	Greater than 100.0 °C	Over range Alarm(Process value goes Below 30.0 °C - 5.0°C)

Output Configuration

Following output configuration available:

- Potential free relay
- Internal buzzer

Flowchart for Channel output configuration.
As shown in following image, mention configuration applicable for each channel.



Alarm Snooze time

When particular channel acknowledgment taken, then after settable snooze time channel again raise output selection i.e. buzzer/Relay.

Input Configuration

There is provision for one digital input which can be configured for input.

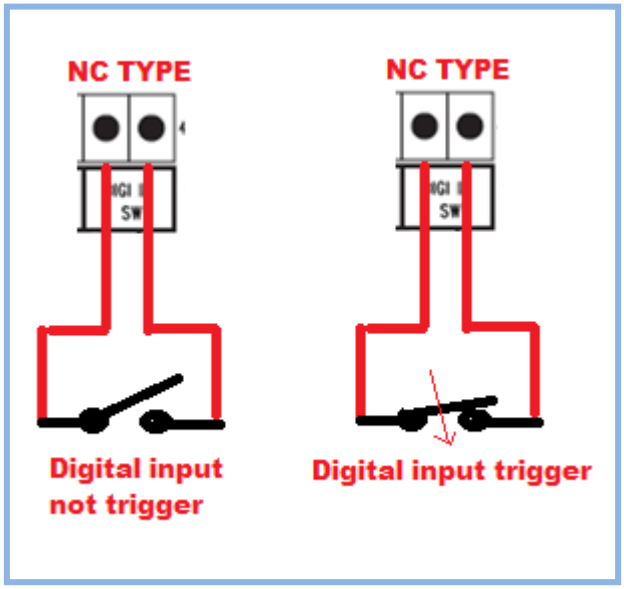
Digital input can be configured from Digital Input Configuration.

Digital Input Set

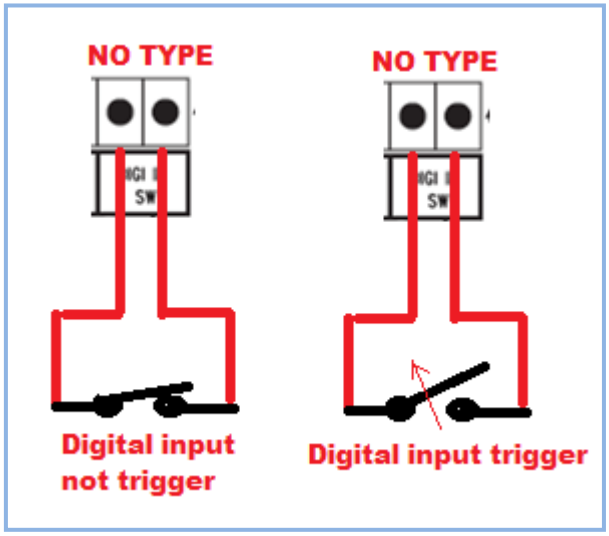
In this menu there are two types of contacts available.

1. NC type.
2. NO type.

When digital input selected as **NC type**, digital input trigger only when contacts get shorted as shown in following figure.



When digital input selected **as NO type**, digital input trigger only when contacts get open as shown in following figure.



Keypad Menu

Keypad menu and there display with description as follows:

SR. NO.	ROW Display	Description	Applicable Type
1	**Admin login**	To Access the menu of unit.	Storage/MODBUS/Indication
2	**Alarm Parameter set**	To set Set-Point and Hysteresis for each channel.	Storage/MODBUS/Indication
3	**Alarm Rly config**	To set relay/inbuilt buzzer alarm status (enable/disable) for channel and relay/inbuilt buzzer assign for channel.	Storage/MODBUS/Indication
4	**DP mute delay**	Set Alarm delay for DP channel	Storage/MODBUS/Indication
5	**Snooze delay**	Set Alarm Snooze delay time	Storage/MODBUS/Indication
6	**Set unit**	To set unit for each channel.	Storage/MODBUS/Indication
7	**Reset Ch. Min-Max**	Reset Minimum and Maximum value for all channels.	Storage/MODBUS/Indication
8	**Digital Input set**	Set Digital Input Configuration	Storage/MODBUS/Indication
9	**Trans Interval**	To set interval for storage of readings (for all channel Enable)	Storage
10	**Reset Trans mem**	To reset all memory.	Storage
11	**Set Device ID**	To set Device ID of system.	Storage/MODBUS/Indication
12	**Buzzer Enable/Dis**	To set buzzer for menu keys & PC memory.	Storage/MODBUS/Indication
13	**Reset to Default**	Reset system parameter to factory default	Storage/MODBUS/Indication
14	**Set Date/Time**	To set date and time of device.	Storage/MODBUS/Indication
15	**Set Time format**	24hr or 12hr.	Storage/MODBUS/Indication

16	**Selection Protocol**	To select Enviro proprietary and Modbus protocol.	MODBUS
17	**Set Admin ID-Pass**	To set admin ID and Password if login with admin ID.	Storage/MODBUS/Indication
18	**System Info**	System Information	Storage/MODBUS/Indication
19	**Back to Main**	Go to Channel Display mode.	Storage/MODBUS/Indication

To represent particular channel on display, following character used.

Display	Channel Description
DP	Differential Pressure Channel
Temp	Temperature Channel
RH	Humidity Channel

NOTE: Menu function is depends upon above application type.

Procedure to access different menu functions:

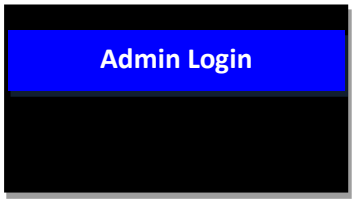
Admin Login Login

This function is used to access various Menu of ETN series device. User must login first to access different menus. For admin log in valid Admin User ID and Password is required, provided by manufacturer.

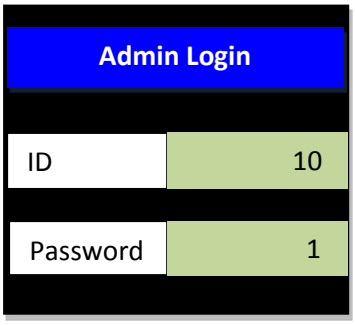
Default Admin **login ID** is 10 and **Password** is 1.

Following Steps to be executed for Admin Login.0

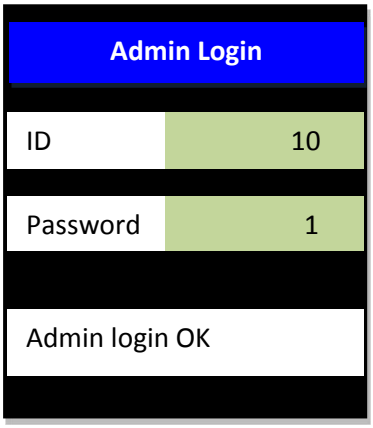
- Go to Admin Login menu using **"SEL"** key.



- Use ENT key to continue. It will ask for Admin User ID, Using **"INC"/ "DEC"** key set Admin User ID as 10.



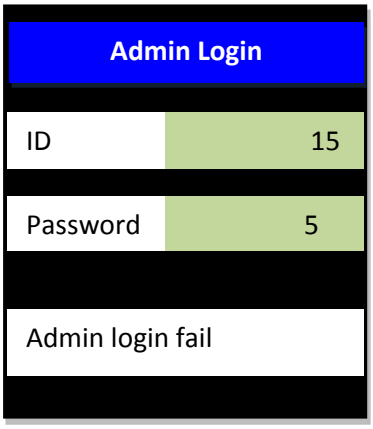
- Then again Press **"ENTER"** key to set Password. Use **"INC"/ "DEC"** key set password to value as 1.
  Press **"ENTER"** to login. For successful login following window will displayed.



After Successful login press SEL key once and use INC/DEC key to select required menu.

For any incorrect ID or Password entered, ETN Series display shows message as

Admin login

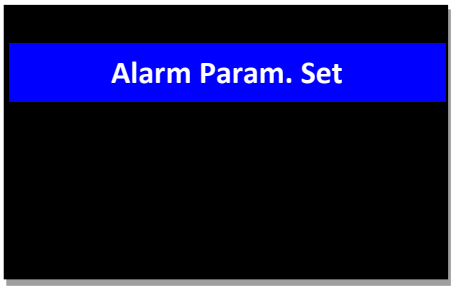
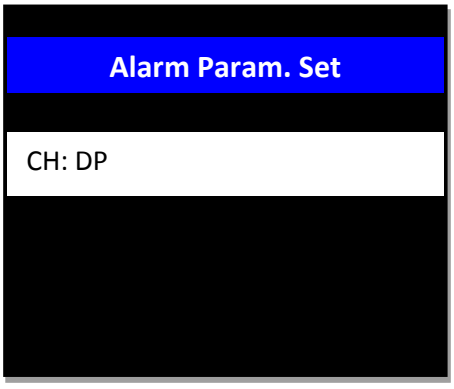


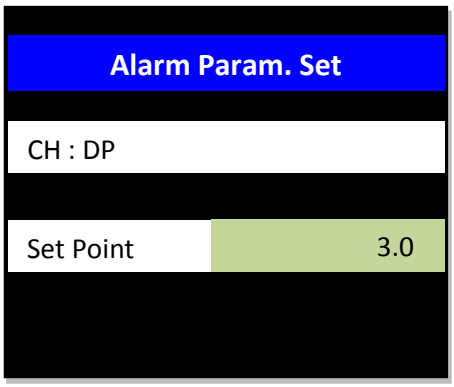
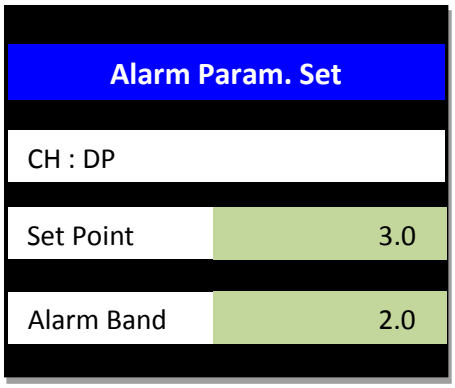
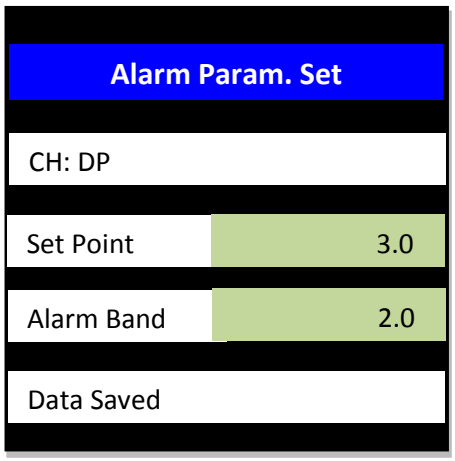
- To exit from Admin Login function press “SEL” key twice
- To log out just go to Admin Login module once again and press “ENT” key.

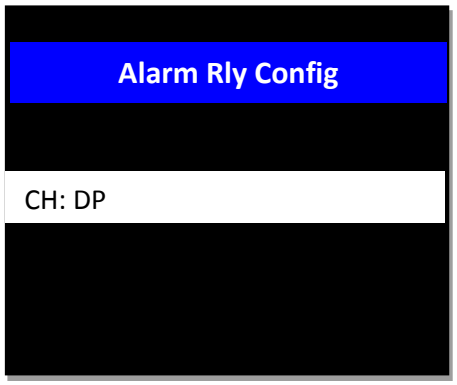
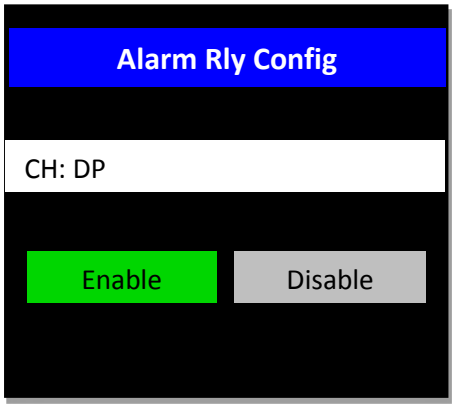
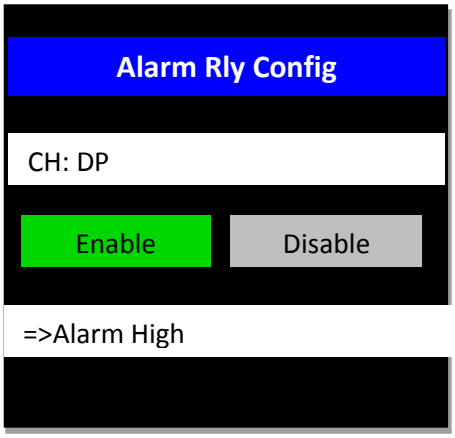
NOTE: If any key is not press within 60 sec during Admin mode then you will exit from Admin mode. To enter in to Admin/Calibration mode again you must Login by using Admin Login Menu else message will be displayed “Need Admin Login” as follows:

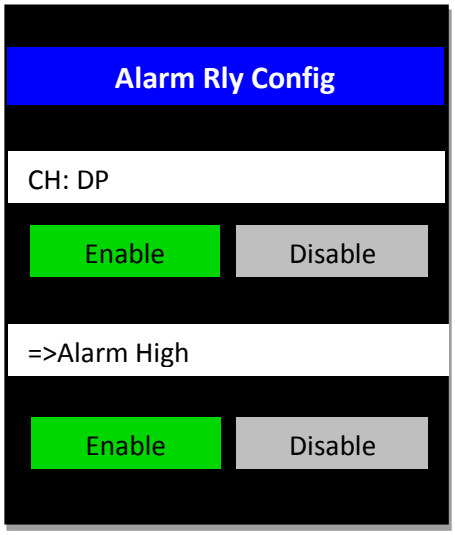
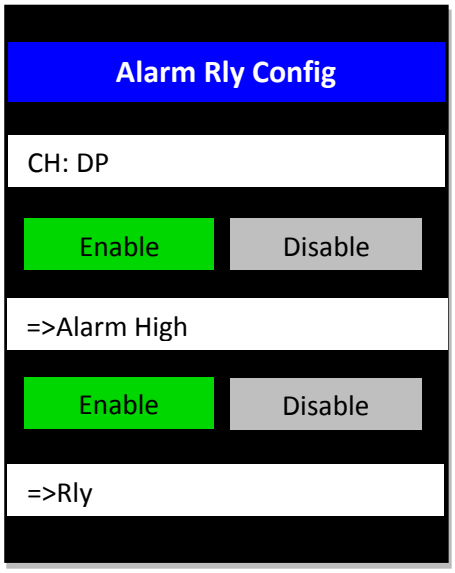
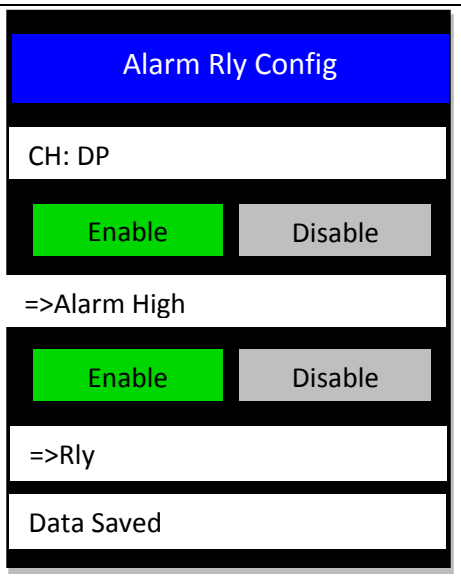
- To Admin Login menu using **"SEL"** key.

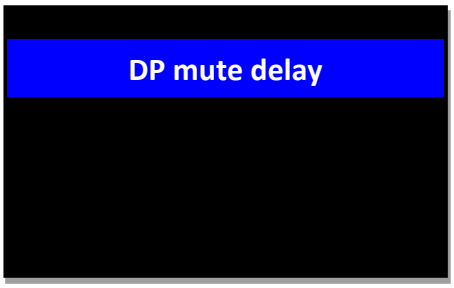
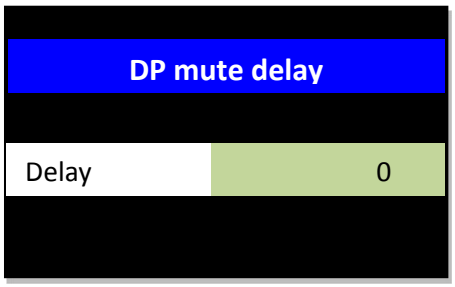
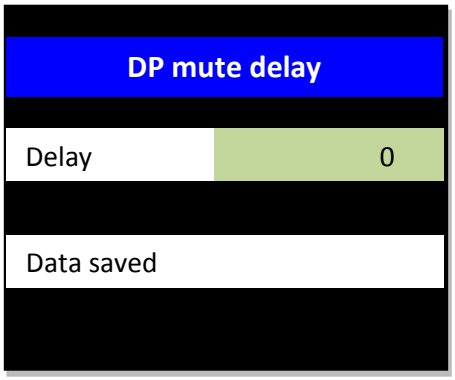
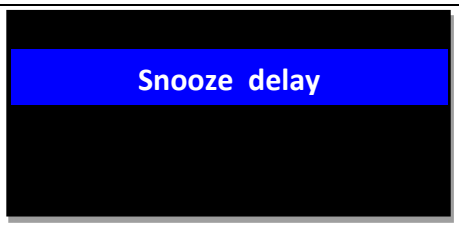
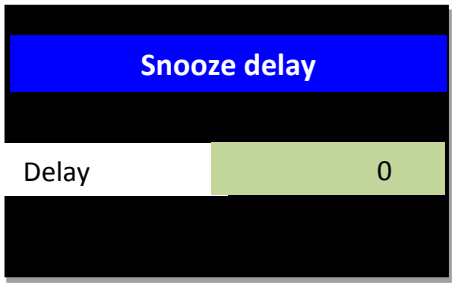
After successful login following menus will be accessed. Operational steps described below:

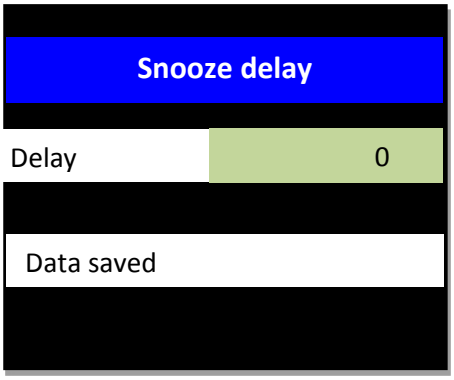
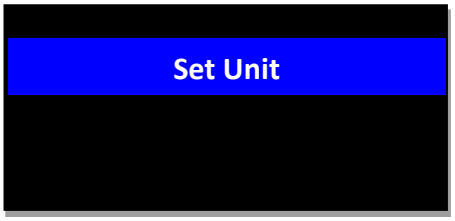
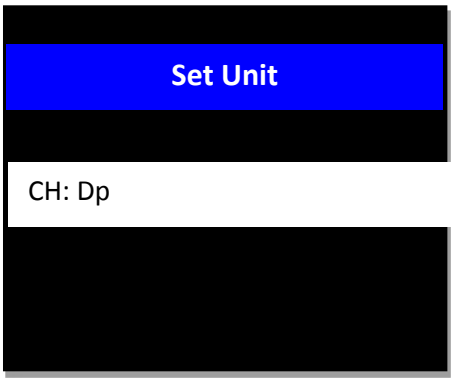
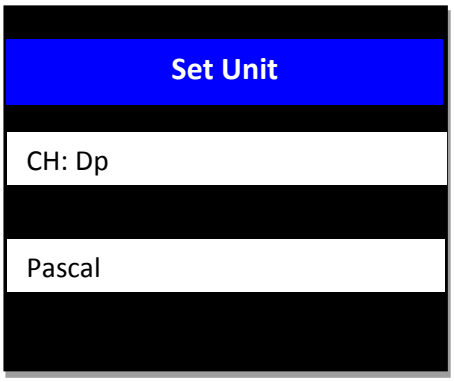
SR No	*Key to be pressed*	*Display*	*Action*
1	**ENT**		Enter into Set Point and Hysteresis menu
	INC/ DEC		Select Channel 1>DP 2>Temp 3>RH

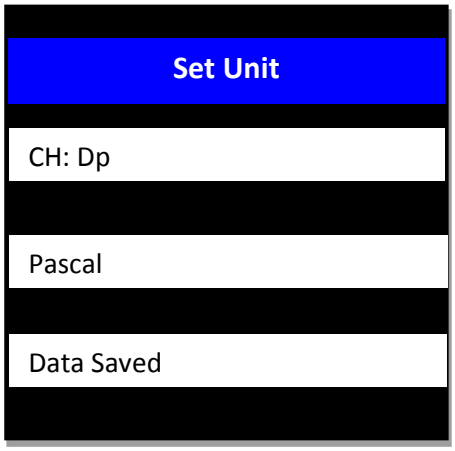
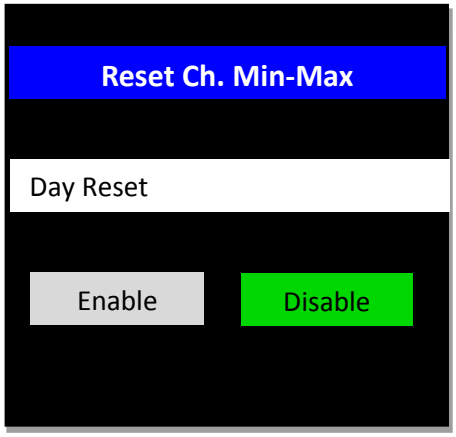
	ENT **INC/DEC**		Current set point for selected channel displayed. INC/DEC key change set point.
	ENT **INC/DEC**		Current hysteresis for selected channel displayed. INC/DEC key change Alarm Band.
	ENT		Selected set point and Alarm Band for channel saved.
2	**ENT**		Enter into Channel Relay Configuration menu.

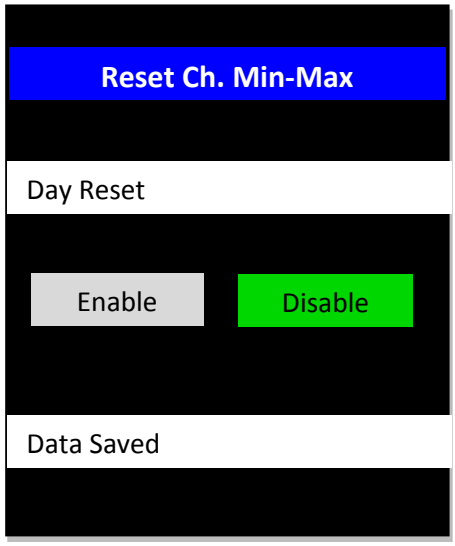
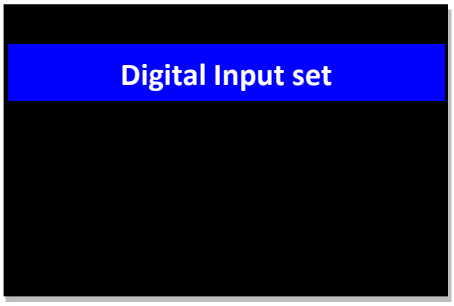
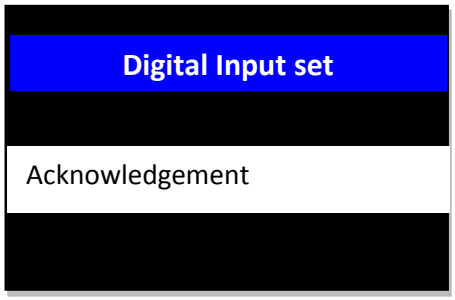
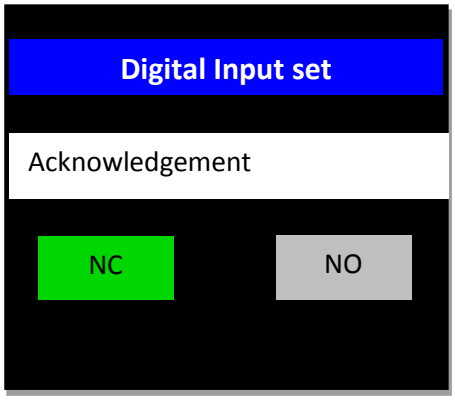
	INC/ DEC ENT		Enter into Channel Relay Configuration menu. Press INC/DEC key channel to scroll to particular channel. Press ENT to select the channel.
	INC/ DEC ENT		Selected channel for Alarm Enable/Disable displayed. Use INC/DEC to Enable/Disable channel for Alarm configuration. If Disable option selected then selected parameter disable for selected channel.
	ENT INC/ DEC		If channel is enabled then Choose the alarm condition press INC/DEC key 1.Alarm High 2.Alarm Low 3. Sensor fail.

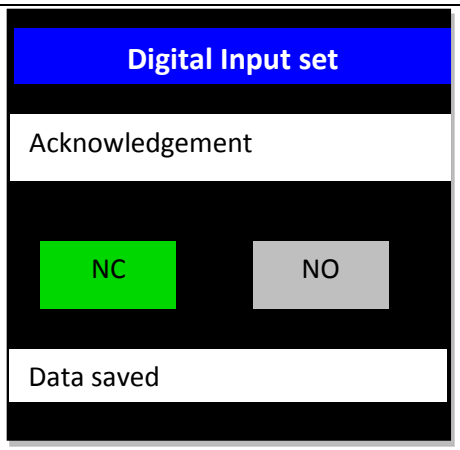
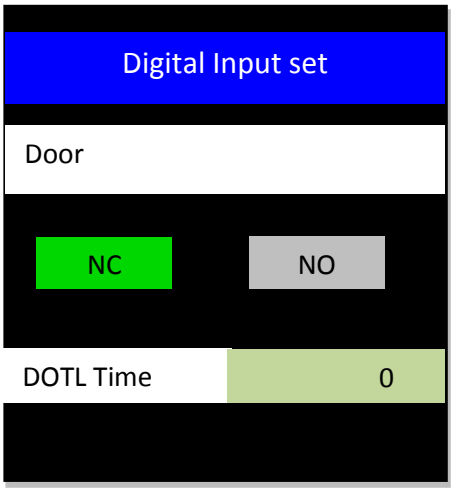
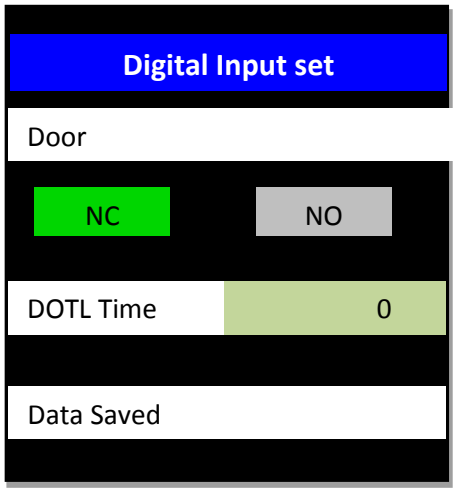
	ENT **INC/** **DEC** **ENT**		Use INC/DEC to Enable/Disable Alarm condition. If Choose the alarm condition enable.
	INC/ **DEC** **ENT**		Select following option displayed for output to be configured for channel. 1>**Rly=Relay** **2>Buz=Buzzer** **3>Rly+Buz=Relay + Buzzer**
	ENT		Save the changes

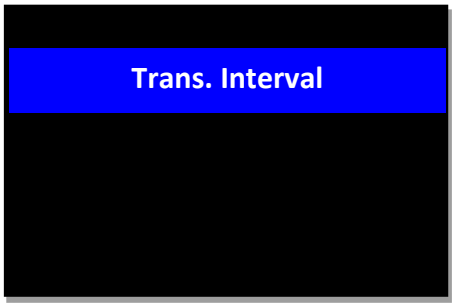
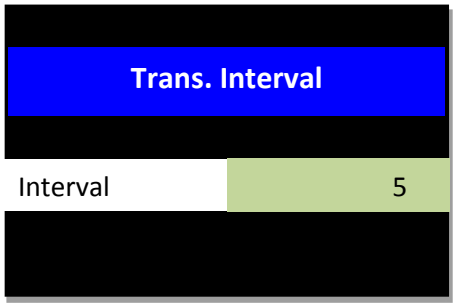
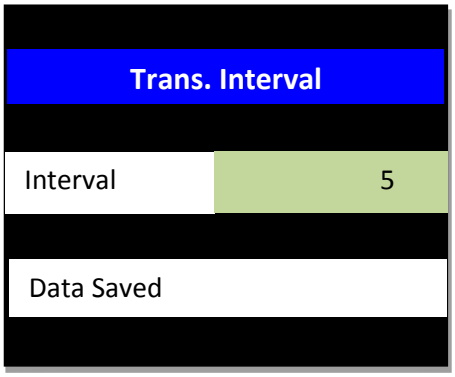
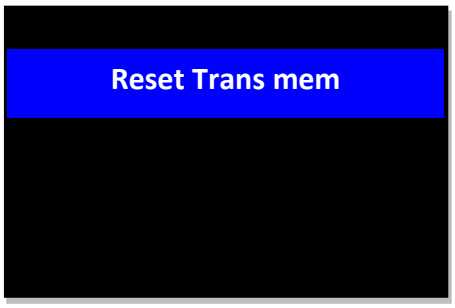
3	**ENT**		Enter into DP mute delay menu for DP channel.
	INC/DEC		Change alarm delay time Alarm Delay Range : 0 : Disable Min : 1 seconds Max : 9999 seconds
	ENT		Selected DP channel alarm delay saved.
4	**ENT**		Enter into Alarm Snooze delay
	INC/DEC		Change alarm delay time. Alarm Delay Range : 0 : Disable Min : 1 seconds Max : 9999 seconds

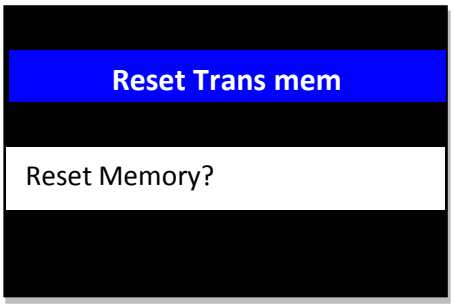
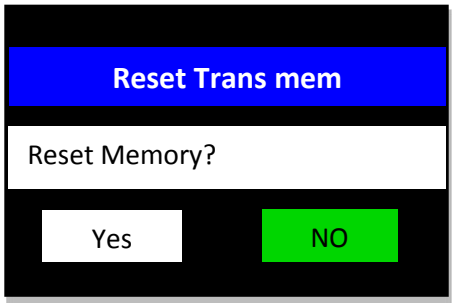
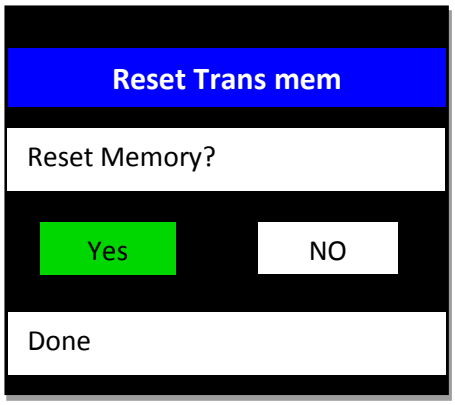
	ENT		Selected DP channel alarm delay saved
5	**ENT**		Enter into Channel Unit Selection
	INC/DEC		Select Channel. *Select desirable channel by INC/DEC key.* ***Channel Displayed depends upon Model Number***
	ENT INC/ DEC		Change Channel Unit depends upon channel selected.

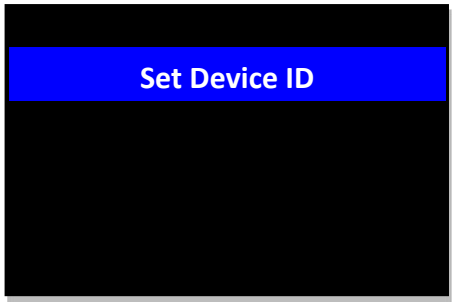
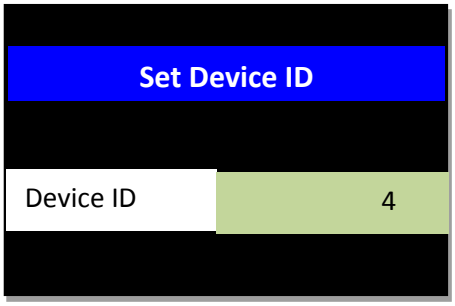
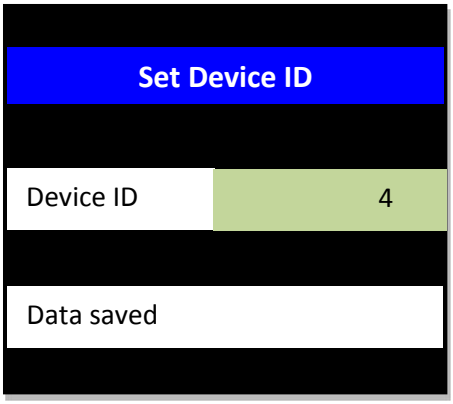
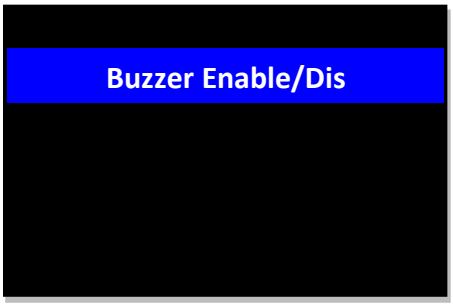
	ENT		Selected unit for channel saved. After save message displayed press INC/DEC key to select next channel.
6	**ENT**		Enter to Menu for Reset Minimum and Maximum value for all channels.
	ENT **INC/** **DEC**		Select Reset Min/Max of all channels by two ways: 1>User Reset 2> Day Reset
	INC/ **DEC** **ENT**		If reset by day option selected then Current Status of reset by day displayed. Enable/Disable Setting.

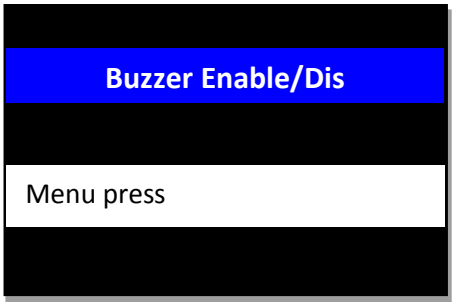
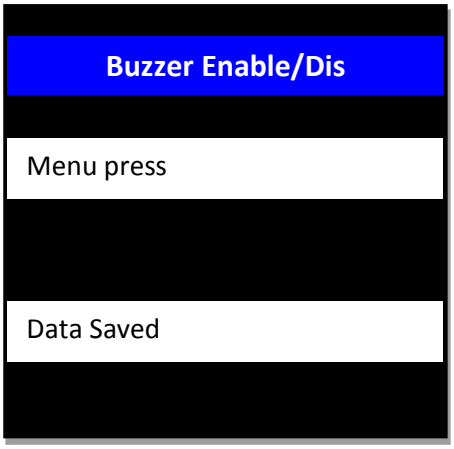
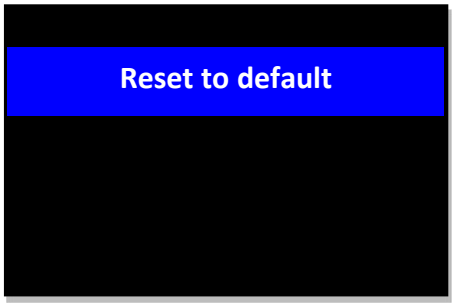
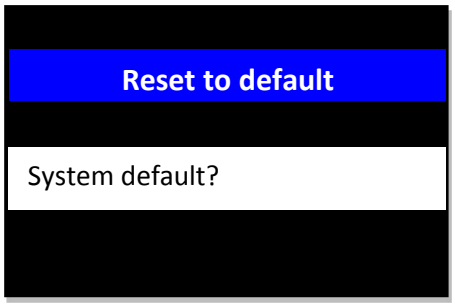
	ENT		Save Setting.
7	**ENT**		Digital I/P settings.
	INC/ DEC		INC/DEC to select from the menu 1> Acknowledgement 2>door 3>Sensor 4>Disable
	INC/ DEC ENT		Select Input type 1>Normally Close type Contacts. 2>Normally Open type Contacts.

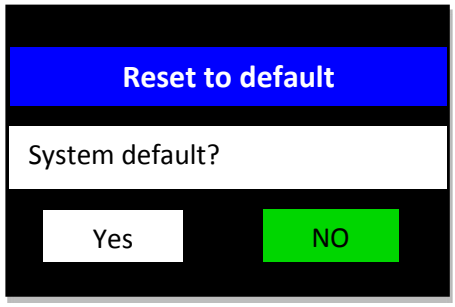
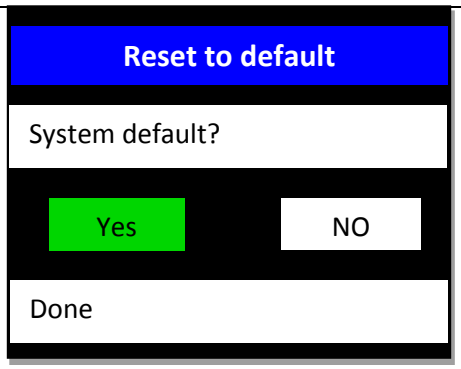
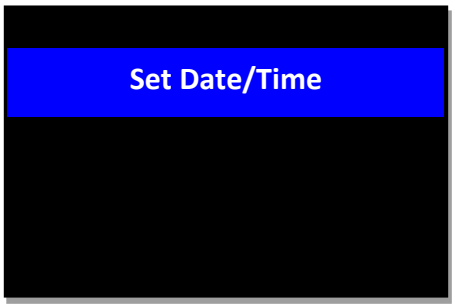
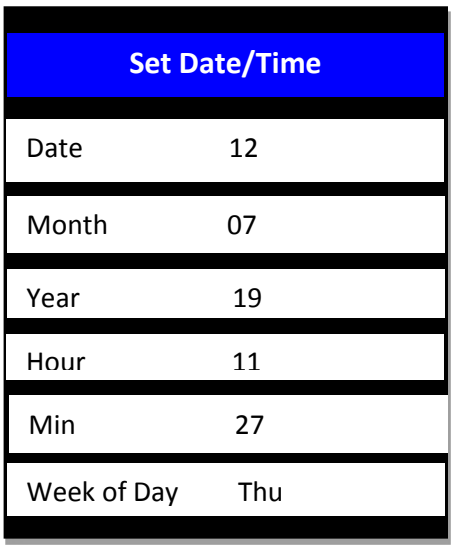
	ENT		Saved changes.
	ENT **INC/** **DEC**		Again it will ask for NC or NO. SELECT required. Select the door open time in seconds. Mute & Dot timer Range : 0 : Disable Min : 1 seconds Max : 9999 seconds
	ENT		Save Setting

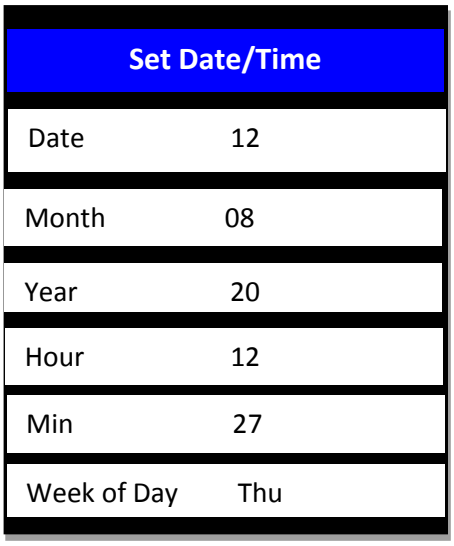
8	**ENT**		Enter to Menu
	INC/ DEC		Current Interval for channel data storage displayed. Change Time interval. Time interval Range : Min : 1 min Max : 255 min
	ENT		Save changes.
9	**ENT**		Enter menu

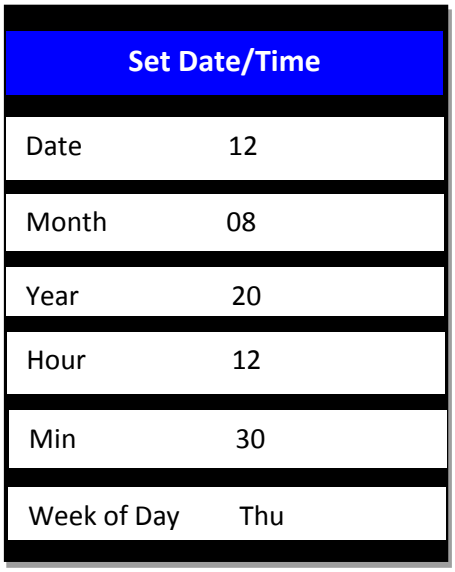
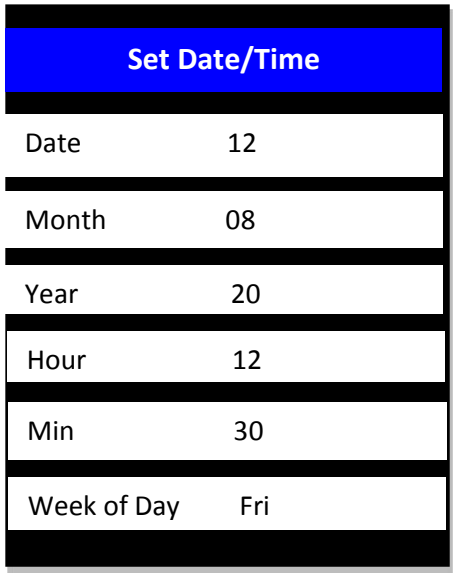
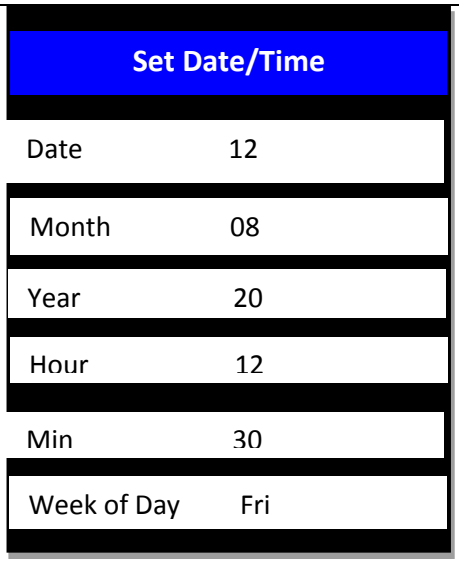
	ENT		Device ask for reset all PC memory
	INC/ DEC ENT		Device ask for confirm to reset PC. To select weather to reset PC memory.(YES/NO)
	ENT		If YES PC memory reset.

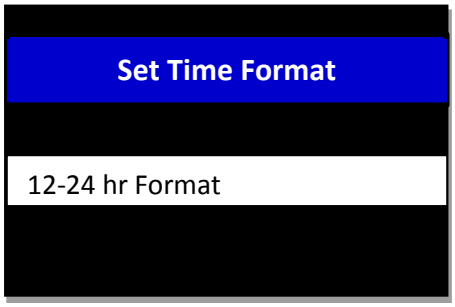
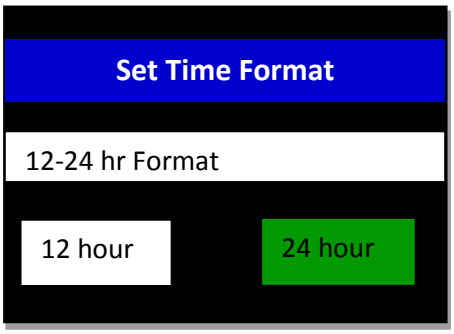
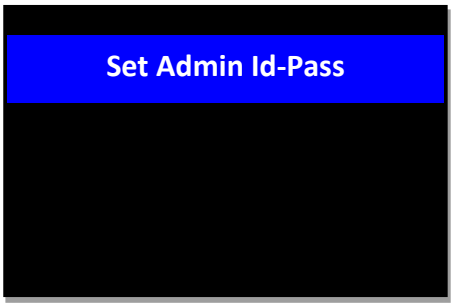
10	**ENT**		Enter into menu
	INC/ DEC		Change device ID Device ID range : Min : 1 Max : 128
	ENT		Selected device ID saved.
11	**ENT**		Enter into buzzer configuration menu.

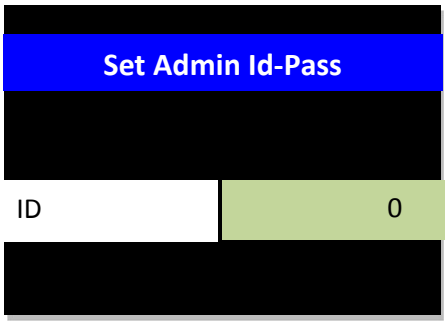
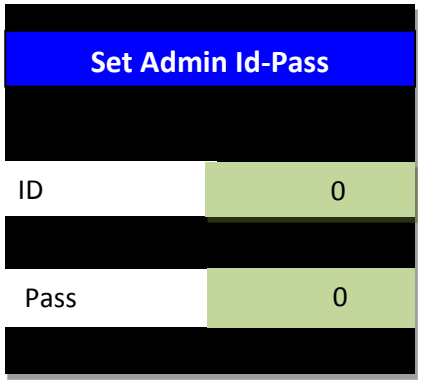
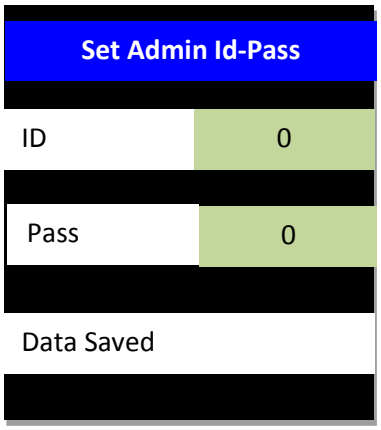
	INC/DEC		Navigate through different buzzer configuration. Different Buzzer Configuration : 1> PC memory 2> Menu press 3> Menu press+ PC mem 4> Disable
	ENT		Save selected settings.
12	**ENT**		Enter menu
	ENT		Device ask for reset all system settings and configuration.

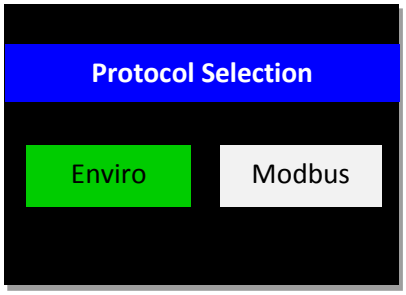
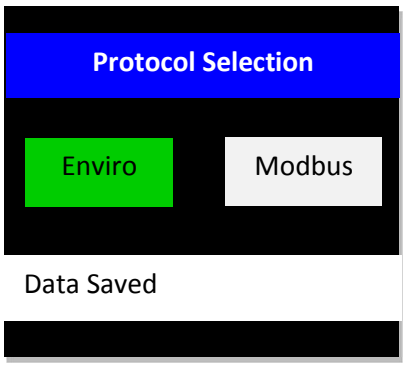
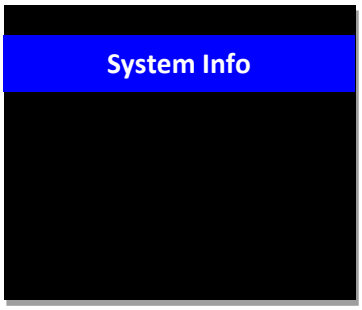
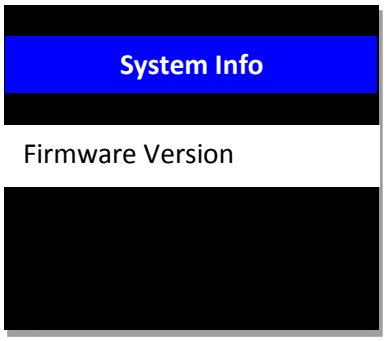
	INC/ DEC		Device ask for confirm to reset. To select weather to reset.(YES/NO)
	ENT		Id select Yes, System and configuration Reset.
13	**ENT**		Set date and time.
	ENT		Change date by pressing INC key.

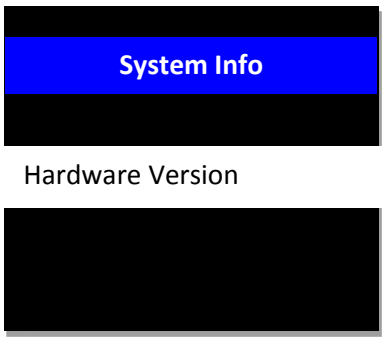
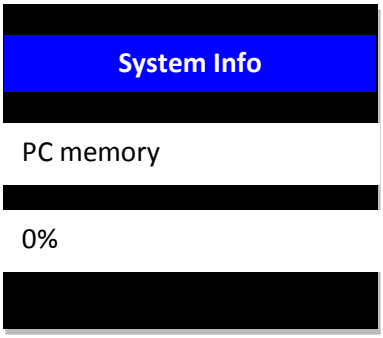
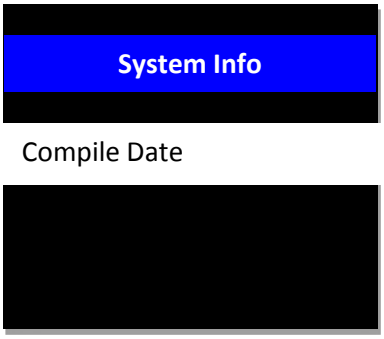
	DEC		Change month by pressing INC key
	DEC		Change Year by pressing INC key
	DEC		Change Hour by pressing INC key

	DEC		Change min by pressing INC key
	DEC		Change week of day by pressing INC key
	ENT		Save the changes.

14	**ENT**		Set Time Format
	INC/DEC		Choose time format
	INC/DEC		1>12 hour with AM/PM indication. 2>24 hour.
15	**ENT**		Enter into Admin ID and password change menu

	ENT **INC/** **DEC**		Display current ID Change ID. ID and Password Range: 0 to 255.
	ENT **INC/** **DEC**		Change the Password.
	ENT		Save Selected ID and Password.
16	**ENT**		Enter into Menu.

	INC/DEC		Protocol selection 1>Enviro 2>Modbus
	ENT		Save Protocol selection
17	**ENT**		To get system information
	ENT		Software Version Displayed.

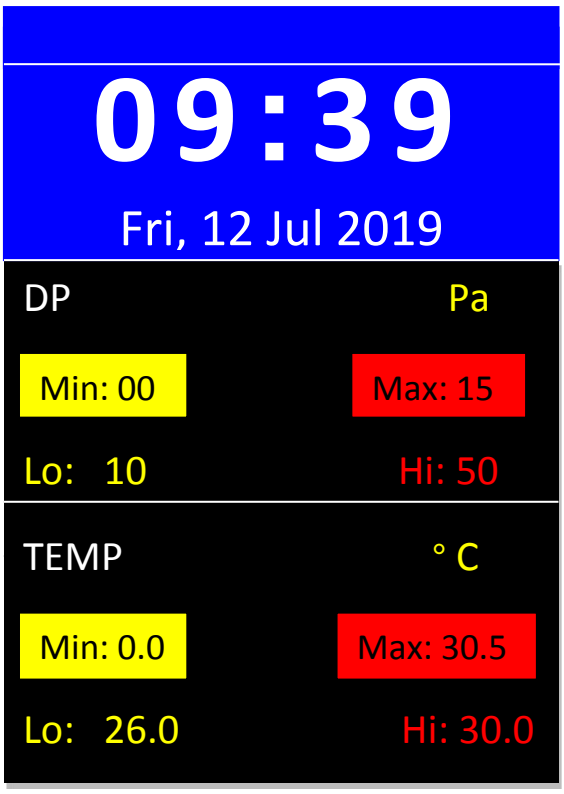
	INC/DEC		Hardware Version Displayed.
	INC/DEC		PC memory Show.
	INC/DEC		Compile Date Show.

Special Short key events

Following are Special Key Function:

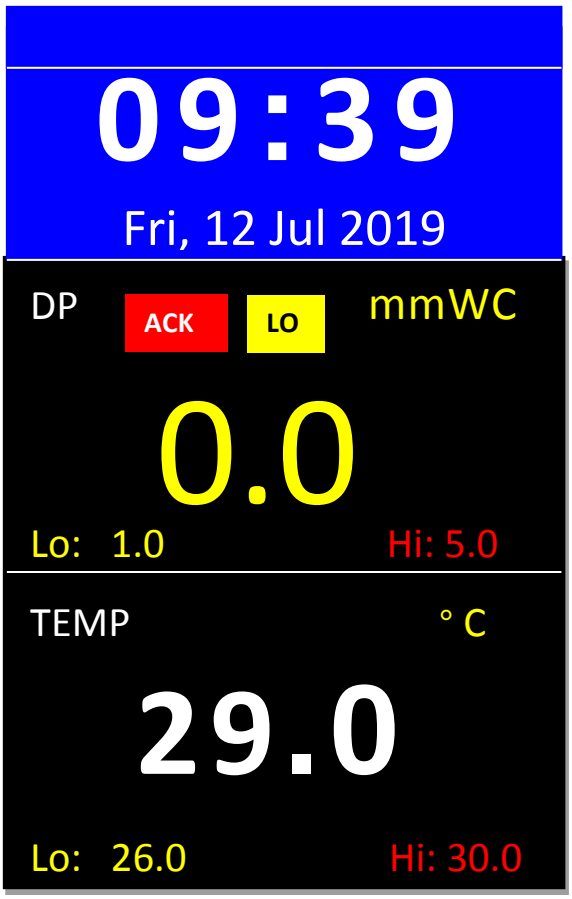
- ❖ Channel minimum and maximum value display
  - ➢ Channel minimum/maximum value displayed by pressing Increment/Decrement key once. In this case displayed channel Maximum and Minimum value gets displayed.

While in channel display mode if user press INC/DEC key once then channel maximum and minimum value get displayed as follows:



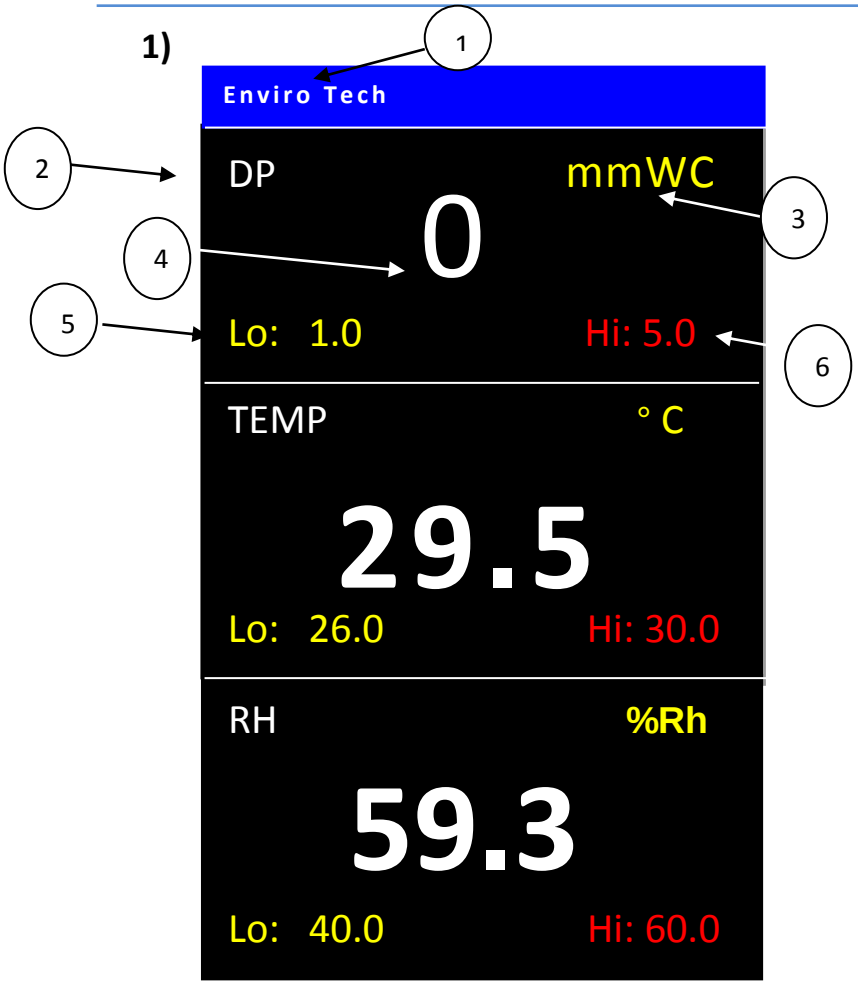
- ❖ Channel alarm acknowledgment
  - ➢ If ENTER key pressed once then Acknowledgement of alarm channel taken.

If ENTER press in Channel Display mode then following screen displayed



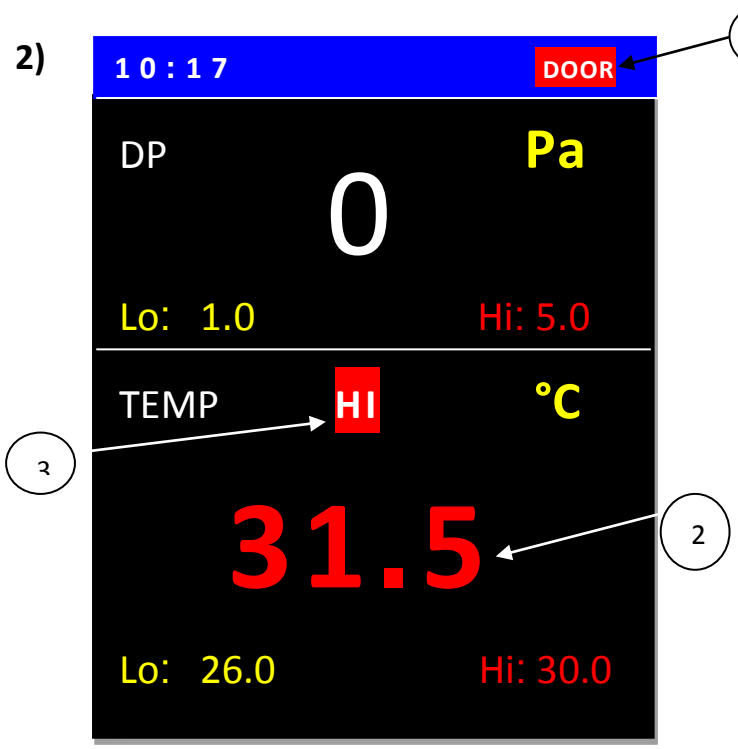
Different Types of Configuration as Follows:

1)



Three channel Dp(1) + Temp(2) +RH(3)
No 1 Header
No 2 represents Channel name (as per parameter)
No 3 represents Channel Unit (as per parameter)
No 4 represents Channel Process value
No 5 represents Lower Alarm Value of respective channel
No 6 represents Higher alarm Value of respective channel

2)



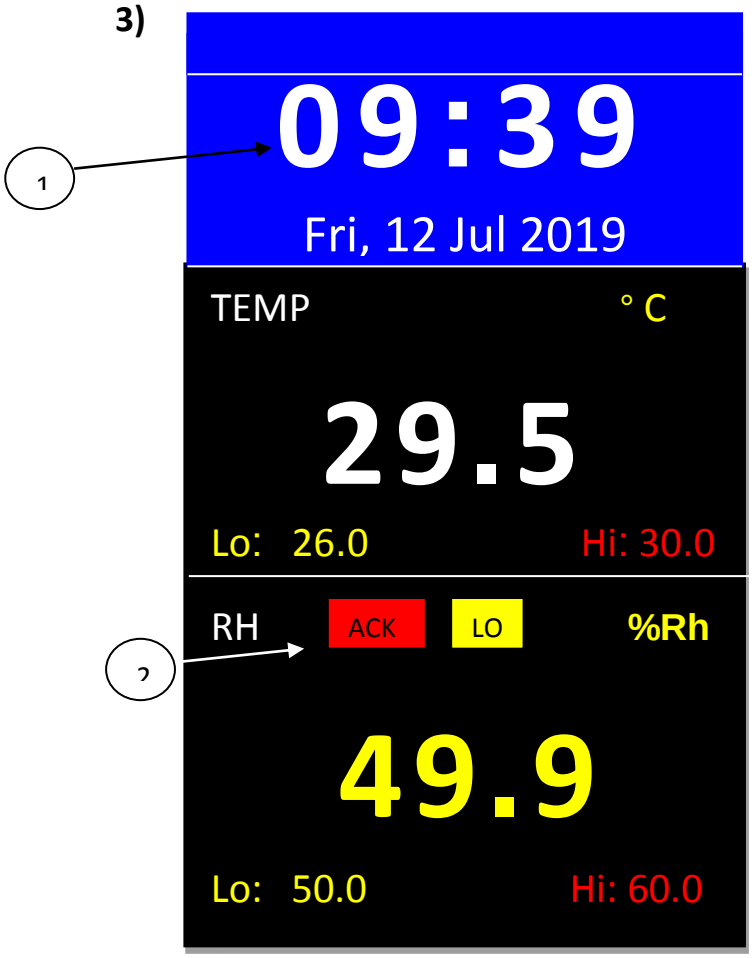
Two channels Dp (1) + Temp (2)

No 1 represents Digital input selection as DOOR type, Then Door is Close it show DOOR with red background and Door is Open DOOR with green Background.

No 2 When any channel in alarm condition process value displayed in red or yellow color else white color.

No 3 represents alarm indication for high alarm with red background and for lower alarm with yellow background.

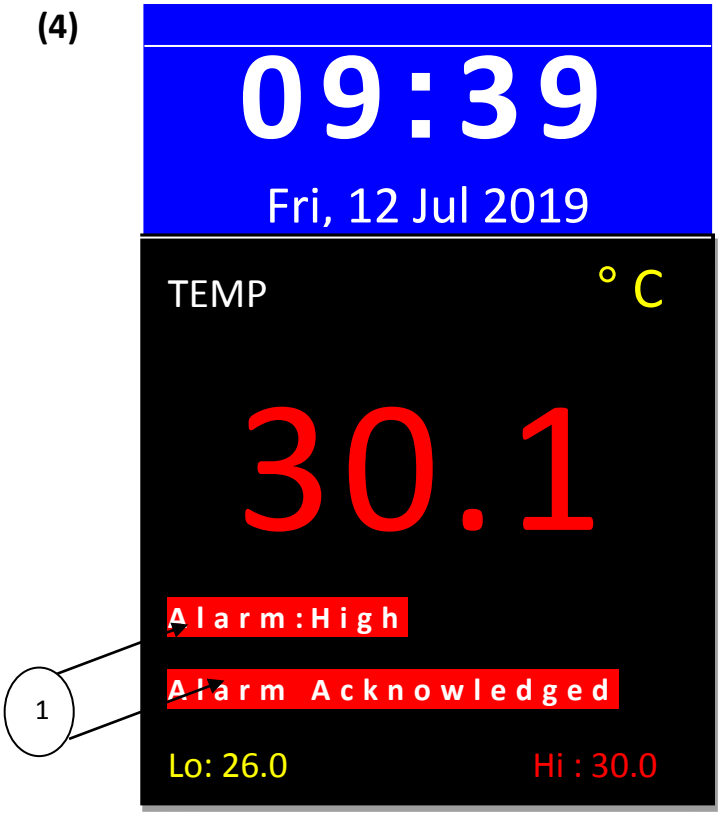
3)



No 1 represents RTC with two row channels Temp (1) + RH (2)

No 2 represents acknowledgement of channel taken.

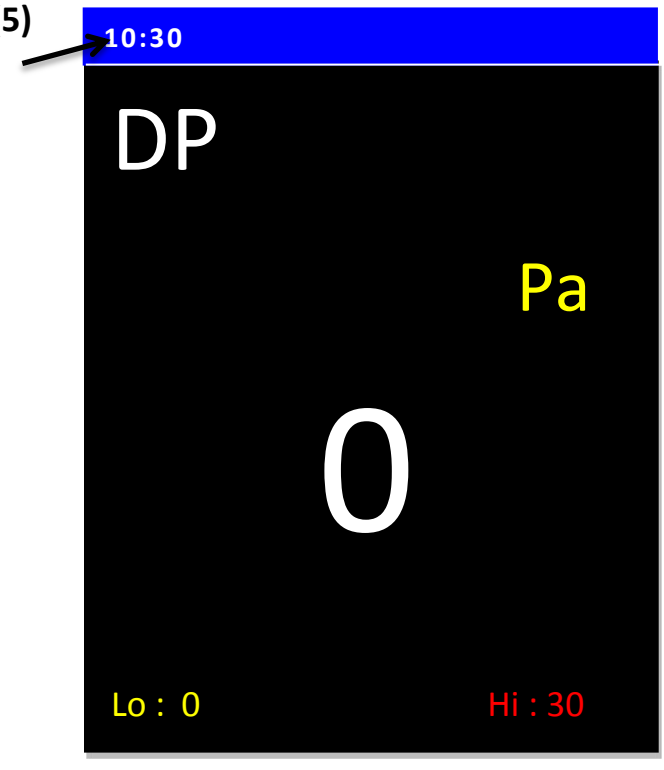
(4)



RTC with single channel

No 1: Different representation of Alarm indication and Alarm acknowledged.

(5)



Single Row with single channel display.

Toggle date and time if required.

Modbus Protocol

ETN series modbus is provided with RS-485 serial interface. The serial communication protocol specifications as follows:

Sr. No.	Parameter Name	Parameter value
1	Modbus mode	RTU
2	Baud rate	9600
3	Number of bits	8
4	Start bit	1
5	Stop bit	1
6	Parity	None

Modbus function codes

Sr. No.	Function Code (hex)	Function Name	Type	Description
1	03	Read Holding Register(multiple data read)	Read only	Read contents of holding register
2	06	Write Single Register	Write	Write contents of single register

Note: To operate device in modbus mode user must select modbus protocol from user menu. Refer **Protocol Selection** menu for reference.

Modbus register map

Address	Read Write Access	Parameter		No of bytes	Note
		Parameter Name	Channel No		
40001	READ/WRITE	Process Value	Channel 1	2	1>In case of temperature and Pressure process value in selected units # Temperature : °C or °F # Pa or mmWc 2>In case of Digital Input **0** : Low **1** : High
40002	READ/WRITE	Process Value	Channel 2	2	
40003	READ/WRITE	Process Value	Channel 3	2	
40004	READ/WRITE	Process Value	Channel 4	2	
40013	READ/WRITE	Alarm Set Point	Channel 1	2	
40014	READ/WRITE	Alarm Hysteresis	Channel 1	2	
40015	READ/WRITE	Alarm Set Point	Channel 2	2	
40016	READ/WRITE	Alarm Hysteresis	Channel 2	2	
40017	READ/WRITE	Alarm Set Point	Channel 3	2	
40018	READ/WRITE	Alarm Hysteresis	Channel 3	2	
40019	READ/WRITE	Alarm Set Point	Channel 4	2	
40020	READ/WRITE	Alarm Hysteresis	Channel 4	2	
40021	READ	Alarm Status	Channel 1	2	**Alarm Status** **0 :** No alarm **1 :** Upper Alarm **2 :** Lower **5 :** URNG **6 :** ORNG **7 :** OPEN
40022	READ	Alarm Status	Channel 2	2	
40023	READ	Alarm Status	Channel 3	2	
40024	READ	Alarm Status	Channel 4	2	
40029	READ/WRITE	Channel Unit	Channel 1	2	**0 :** for °C(Centigrade) **1 :** °F(Fahrenheit) **2 :** %RH **3 :**PA **4 :**mmWC **5** :Digital input Channel unit depends upon type of channel
40030	READ/WRITE	Channel Unit	Channel 2	2	
40031	READ/WRITE	Channel Unit	Channel 3	2	
40032	READ/WRITE	Channel Unit	Channel 4	2	
40033	READ/WRITE	DD	-	2	DD : Date MM : Month YY : Year HH : Hour MM : Minutes SS : Second WOD : Week of the day 0: Sunday, 1: Monday and so on. Time setting in 24 hour format
40034	READ/WRITE	MM	-	2	
40035	READ/WRITE	YY	-	2	
40036	READ/WRITE	HH	-	2	
40037	READ/WRITE	MM	-	2	
40038	READ/WRITE	SS	-	2	
40039	READ/WRITE	WOD	-	2	

40048	READ/WRITE	RUAR		Channel 1	2	128: no selection 1:Relay 17:Buzzer 33:Relay+Buzzer
40049	READ/WRITE	RLAR			2	
40050	READ/WRITE	RSFR			2	
40051	READ/WRITE	RUAR		Channel 2	2	
40052	READ/WRITE	RLAR			2	
40053	READ/WRITE	RSFR			2	
40054	READ/WRITE	RUAR		Channel 3	2	
40055	READ/WRITE	RLAR			2	
40056	READ/WRITE	RSFR			2	
40057	READ/WRITE	RUAR		Channel 4	2	
40058	READ/WRITE	RLAR			2	
40059	READ/WRITE	RSFR			2	
40060	READ/WRITE	Acknowledgement		-	2	When write to 1 Acknowledgement taken when Read bitwise Status 1: for Acknowledgement taken. Status 0: no Acknowledgement taken. CH4 | CH3 | CH 2| CH 1

Modbus register details

Register address		40001 to 40004

Details
This register provides process value details of respective channels.

Following are special case of process value data to indicate sensor failure state as follows:

Register data in hex	Description
0x4000	URNG(Sensor Under range condition)
0x4001	ORNG(Sensor Over range condition)
0x4002	OPEN(Sensor Open condition)

Example

1> In case of Pressure channel, we can read following address.

Register address	Use
40001	To read Process value of DP channel
40029	To read unit of DP channel

Following table demonstrates Pressure channel real value calculation.

Register address	Register data after read	Data to be predicted
40001	25	Pressure value 25
40029	3	Pressure unit is Pascal

In above case Real value of pressure is 25 Pascal.

2>In case of Pressure channel, we can read following address.

Register address	Use
40001	To read Process value of DP channel
40029	To read unit of DP channel

Following table demonstrates Pressure channel real value calculation.

Register address	Register data after read	Data to be predicted
40001	3.5	Pressure value 3.5
40029	4	Pressure unit is mmWC

In above case Real value of pressure is 3.5 Pascal without decimal point.

3>In case of Temperature channel, we can read following address.

Register address	Use
40002	To read Process value of temperature channel
40030	To read unit of temperature channel

Following table demonstrates Temperature channel real value calculation.

Register address	Register data after read	Data to be predicted
40002	285	Process value 285
40030	0	Temperature unit is °C

In above case Real value of pressure is 28.5 °C with one decimal point.

Register address		**400013 to 40020**

Details

- These register used to read/write Channel alarm set point and hysteresis.
- Read procedure for Set point as same as Process value read except address change.
- Write procedure to Set point of particular channel required as follows:-

  Decimal point and Unit of channel must consider before writing data.

  For Hysteresis range is 0 to 200.

Register address		**40021 to 40024**

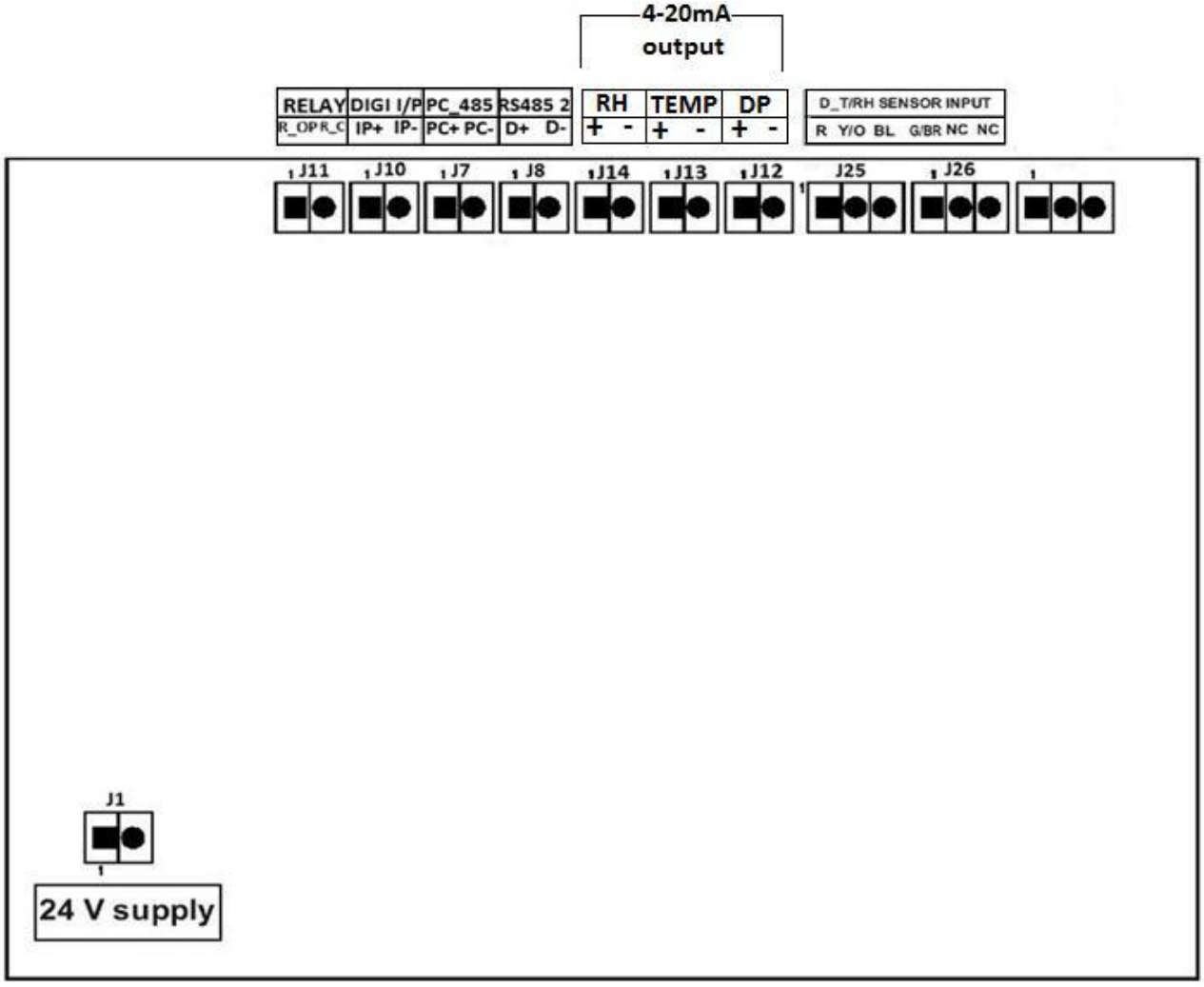
Details

Alarm Status represents current status of particular channel.

Details regarding alarm status as follows:-

Alarm Bit	**:**	**Alarm Type**	**Description**
0	:	No Alarm	Normal Condition
1	:	Upper Alarm	Upper alarm Condition
2	:	Lower Alarm	Lower alarm Condition
5	:	URNG	Sensor Under range condition
6	:	ORNG	Sensor Over range condition
7	:	OPEN	Sensor Open condition

Connector Connection Details:



Digital I/P

Digital I/P are a potential free input just connect the switch to it & do not connect supply to it.

Power Supply: 24Volt		
Pin No.	**Legend**	**Description**
1	+	Positive
2	-	GND

Relay		
Pin No.	**Legend**	**Description**
1	R_C	Relay can be used as NC or NO contacts by jumper settings.
2	R_OP	

RS485 1:

PC COMMUNICATION		(RS 485 1)
Pin No.	**Legend**	**Description**
1	PC+	For communication with PC / (MODBUS).
2	PC-	

RS485 2:

(RS 485 2)		
Pin No.	**Legend**	**Description**
1	D+	To connect Remote Display (DCT).
2	D-	

Pressure Sensor pipe connection:

Pressure pipes connection		
Nozzle	**Legend**	**Description**
1	P+	Pressure to be measured
2	Dome nozzle	

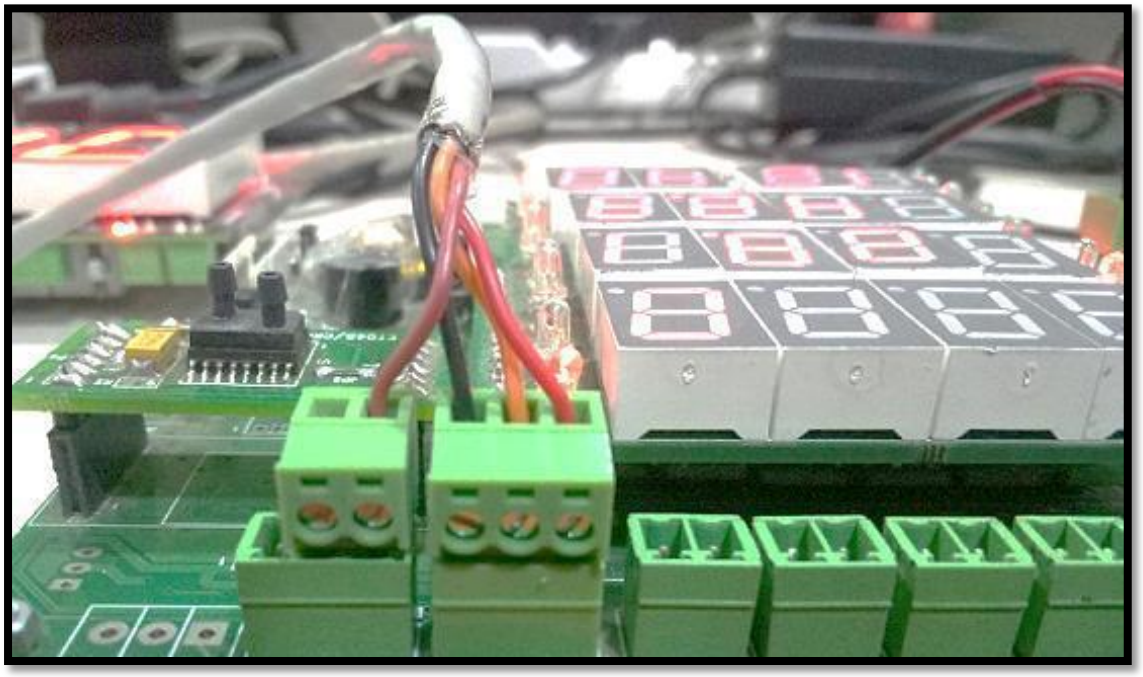
Digital Temperature Humidity Connection Details

- **For connector used:**

Digital Inbuilt Temperature + RH Connection Details.	
Legend	**Description**
J25_1	**YELLOW/ORANGE**
J25_2	**RED**
J25_3	**GREEN/BROWN**
J26_1	**BLACK**

NOTE: Connect Sensor cable as shown above table color code to avoid any damage to sensor.

THIS IMAGE ONLY FOR REFERENCE.

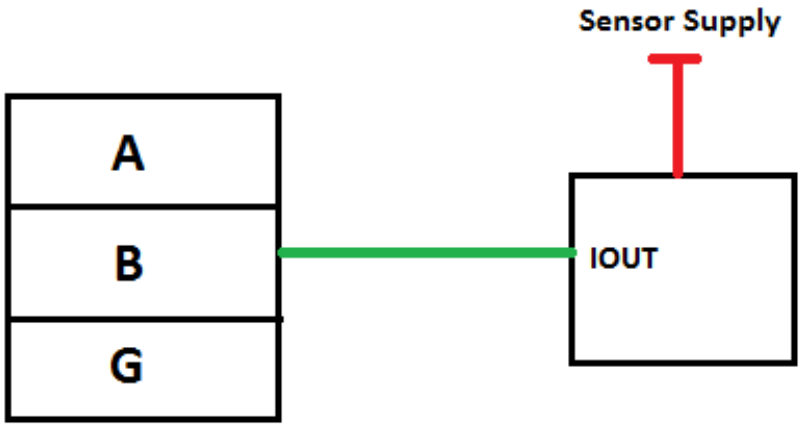


- **4-20mA Sensor Connection :**
- **For connector used:**

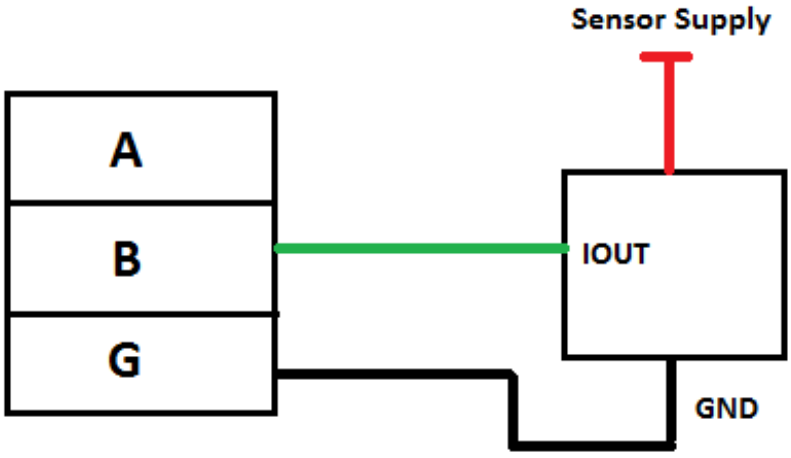
4-20mA Temperature Connection Details.	
Legend	**Description**
J25_1	**NC**
J25_2	**IOUT**
J25_3	**NC/GND**

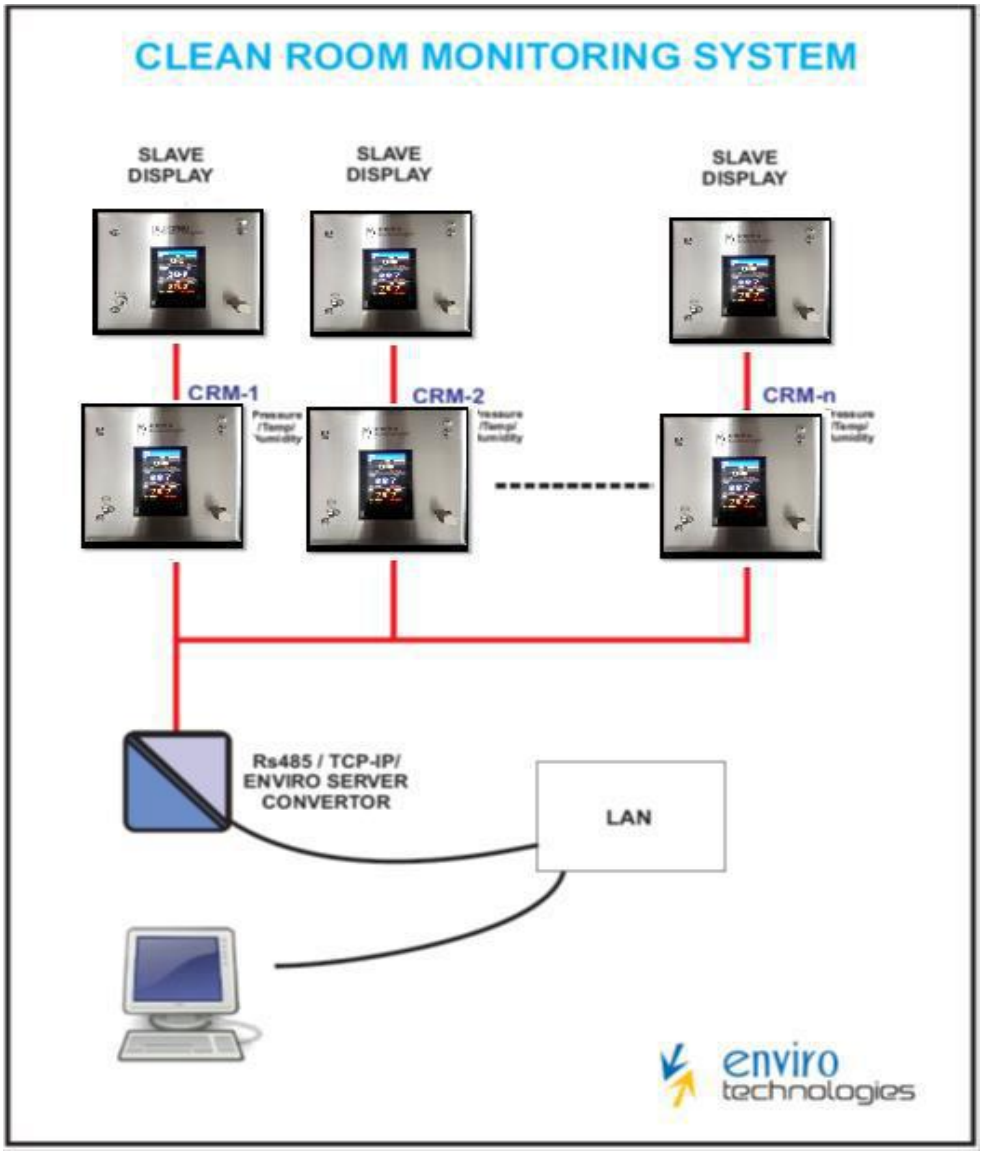
4-20mA RH Connection Details.	
Legend	**Description**
J26_1	**NC**
J26_2	**IOUT**
J26_3	**NC/GND**

1> Retransmission 2 wire type.



2> Retransmission 3 wire type.





Installation Note:

While installing this system one must take care of following points:

- All cables connecting to ETN series device must lie separately; they should not mix up with high voltage & high current cables (like Motor; compressor; contactor; Heater etc.
- There should be a proper insulation for sensor wires to avoid noise interrupt.
- RS-485 converter with cable is use for PC communication.
- Cable specification for RS-485 => 14/36; 22AWG; 2 core shielded twisted cable.
- PT100 sensor Cable length: 100metre MAX.
- 4 to 20mA sensor cable length: 70 meter max (keep as short as possible.)

Troubleshooting Chart

Following are few troubles shooting point which will guide for rectifying problem while dealing with DPMS.

No	Problem	Probable solutions
1.	**Display Doesn't show reading of any Channel.**	1. Set device display mode properly. 2. Check particular channel is enabled properly. 3. Check all sensor pins are connected properly.
2.	**Sensor connections**	4. T+RH sensor connections has been given on sticker itself .Do the sensor pin connections properly to avoid sensor burning problems.
3.	**Buzzer does not works**	5. Enable the buzzer in buzzer settings.
4.	**Date and time is changed after reset.**	6. Set the date and time from Menu. 7. Check internal battery (change if required).
5.	**Remote display does not show reading.**	8. Check RS-485 wire connection (D+ & D-).
6.	**Relay is not working.**	9. Check settings in Relay configuration menu.
7.	**Acknowledgment from digital I/P is not working.**	10. Select Acknowledgment from Digital configuration menu. 11. Check DIGI IN wire connection.
8.	**Buzzer does not beep after door open.**	12. Check the mute time in digital I/P configuration menu.
9.	**Does not show memory full indication for 70% or more.**	13. Check the buzzer settings in the menu and select the required one.
10.	**Buzzer does not beeps on Alarm condition**	14. Check the Relay configuration settings & select the required one eg. (BZ ONLY OR RELAY+BZ
11.	**Device not communicating in modbus mode**	15. Check protocol selection menu. 16. Check for proper device ID selection. 17. Check for proper function codes.(**"03"** or **"06")**