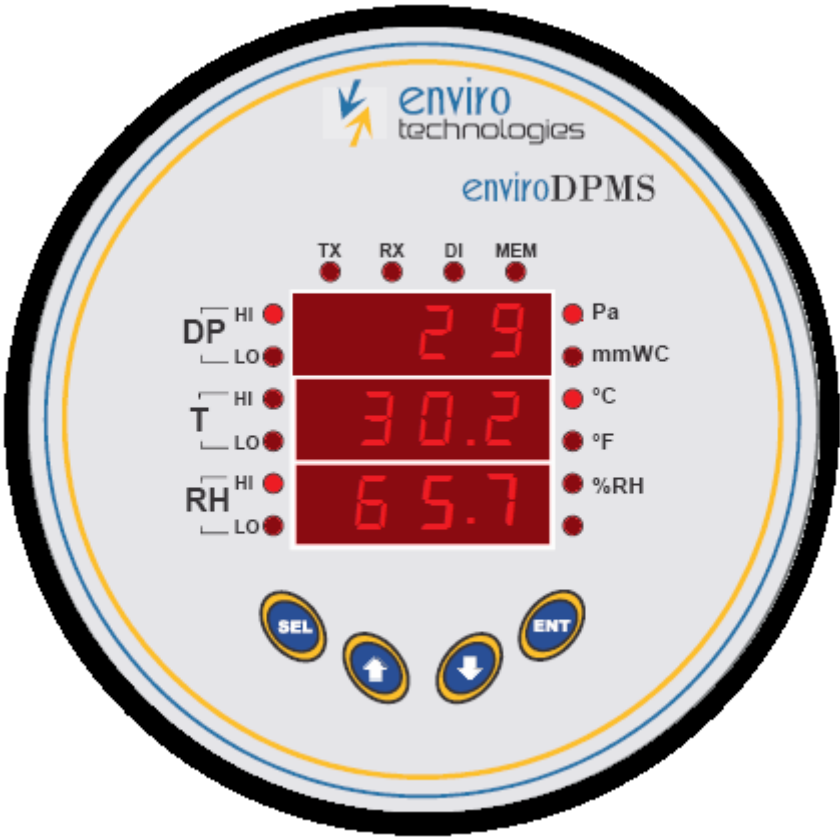


DPMS

Differential Pressure Monitoring System

USER MANUAL



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Introduction

A DPMS Differential Pressure Monitoring System is microcontroller based electronic system which is specially design for measuring Differential pressure, with Temperature and Humidity as per required by user. Device measures Differential pressure which has inbuilt sensor in device and Temperature and Humidity, Temperature and Humidity sensors can be connected externally.

Device has 3 4digit 7segment displays to show all its parameter data and process value which is easily readable form long distance. Device shows Pressure, Temperature and Humidity process value on 1st, 2nd, 3rd row respectively. Indicating leds are use for Channel number; Parameter Unit, Alarm, Sign, Memory full and Tx/Rx which are useful while monitoring and trouble shooting. 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.

Device is design with standard circular mounting dimension which can replace existing mechanical dial gauges on site.

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 :	<p>Channel 1(Factory Settable)</p> 1. Inbuilt Differential Pressure sensor range 0 to 100Pascal / 0.0 to 10.0 mmWC (factory settable) 2. External differential sensor input (0 to 5Vmax), 0mA to 20mA, 4mA to 20mA <p>Channel 2 (Factory Settable)</p> 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) <p>Channel 3 (Factory Settable)</p> 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)
3	Channel Accuracy/Resolution :	<p>Channel 1</p> 1. Accuracy:- 1. Inbuilt Differential Pressure sensor accuracy 3% of Full Scale. 2. External differential pressure sensor accuracy depends on range and sensor. 2. Resolution:- 1. Inbuilt Differential Pressure sensor resolution 1 Pascal / 0.1mmWC 2. External differential sensor resolution depends on range and sensor resolution. <p>Channel 2</p> 1. Accuracy:- 1. For Inbuilt Temperature sensor accuracy 0.3°C. 2. For External PT-100 sensor accuracy 0.3°C. 2. Resolution:- For Inbuilt Temperature sensor resolution 0.1°C. For External PT-100 Sensor resolution 0.1°C.

			<p>Channel 3</p> <p>1. Accuracy:- For Inbuilt Humidity sensor accuracy 3% RH. For External Humidity sensor accuracy 2% RH.(Depends on Sensor)</p> <p>2. Resolution:- For Inbuilt Humidity sensor resolution 0.7 % RH. For External Humidity sensor resolution 0.1 % RH.</p>
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	:	112mm diameter standard circular enclose with field replaceable with mechanical gauge. Depth 46mm with collar Diameter of 132mm with air tight front panel.
12	Device Fitting	:	3 clamps for holding device.
13	Device Rating	:	24VDC, 150mAmp.
14	Operating Temperature	:	0°C to 50°C
15	Size	:	112mm X 46mm Dept with 132 mm front collar
16	Device Fitting	:	Device can be fit with 3 holding clamps.
17	Weight	:	---

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	: Dual 0.39"inch 4 Digit 7 Segment bright LED display for better visibility.
3	Keypad	: 4 menu operated tactile switch
4	LED indicator	: Different LED indication for Parameter Unit, Process value sign, Lower and Upper Alarm, Channel No information, Tx/Rx communication, 70% Memory full alert indication, Common Alarm indicator.
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		
• DP HI	:	Upper Alarm(Channel 1)
• DP LO	:	Lower Alarm(Channel 1)
• T HI	:	Upper Alarm(Channel 2)
• T LO	:	Lower Alarm(Channel 2)
• RH HI	:	Upper Alarm(Channel 3)
• RH LO	:	Lower Alarm(Channel 3)
• MEM	:	Memory 70% Full indication
• DI	:	Digital Input Alarm Indication
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
4. SEVEN SEGMENT DISPLAY (ROW1)		
• Time/Channel Name	:	Time with sec blinking
• Menu	:	GUI menu parameter display
• Channel Process Value	:	Display Process value with deimal points(Channel 1)
5. SEVEN SEGMENT DISPLAY(ROW2)		
• PV	:	Display Process value with deimal points(Channel 2)
• Menu	:	GUI menu sub parameter display
6. SEVEN SEGMENT DISPLAY(ROW3)		
• PV	:	Display Process value with deimal points(Channel 3)
• Menu	:	GUI menu sub parameter display

Front View of device:



Indication LEDs Details:

Alarm Indication

- **UA** : Upper Alarm
- **LA** : Lower Alarm
- **MEM** : Memory Full
- **DI** : Digital Input Alarm Indication
- **DP HI** : Channel 1 High Alarm
- **DP LO** : Channel 1 Low Alarm
- **T HI** : Channel 1 High Alarm
- **T LO** : Channel 1 Low Alarm
- **RH HI** : Channel 1 High Alarm
- **RH LO** : Channel 1 Low Alarm

Unit Indication

- **Pa** : Pascal
- **mmWC** : millimetres of water
- **°C** : Degree Centigrade.
- **F** : Degree Fahrenheit.
- **%RH** : Humidity

PC com port Indication

- **TX** : Transmit
- **RX** : Receive

Seven Segment Display (ROW 1)

- Time Display with middle decimal point blinking while displays Time.
- Main menu name while UI access.
- Channel 1 Process Value

Seven Segment Display (ROW2)

- Display Process Value with decimal Point
- Sub menu parameter while UI access.
- Channel 2 Process Value

Seven Segment Display (ROW3)

- Channel 3 Process Value
- Sub menu parameter while UI access.

DPMS Model Number Details

SR. No.	Model No.	Details	Model No Code
1	ETS-DPI-K40 ETS-DPI-K40-X ETC-DPI-K40 ETC-DPI-K40-X	Indication + DP channel	M0
2	ETS-DPI-K41 ETS-DPI-K41-X ETC-DPI-K41 ETC-DPI-K41-X	Indication + (DP + Temperature) channel	M1
3	ETS-DPI-K43 ETS-DPI-K43 -X ETC-DPI-K43 ETC-DPI-K43 -X	Indication + (DP + Temperature + Humidity) channel	M2
4	ETS-DPI-K03 ETS-DPI-K03-X ETC-DPI-K03 ETC-DPI-K03-X	Indication + (Temperature + Humidity) channel	M3
5	ETS-DPI-K01 ETS-DPI-K01-X ETC-DPI-K01 ETC-DPI-K01-X	Indication + (Temperature) channel	M4
6	ETS-DPS-K40 ETS-DPS-K40-X ETC-DPS-K40 ETC-DPS-K40-X	Storage + DP channel	M5
7	ETS-DPS-K41 ETS-DPS-K41-X ETC-DPS-K41 ETC-DPS-K41-X	Storage + (DP + Temperature) channel	M6
8	ETS-DPS-K43 ETS-DPS-K43 -X ETC-DPS-K43 ETC-DPS-K43 -X	Storage + (DP + Temperature + Humidity) channel	M7
9	ETS-DPS-K03 ETS-DPS-K03-X ETC-DPS-K03 ETC-DPS-K03-X	Storage + (Temperature + Humidity) channel	M8
10	ETS-DPS-K01 ETS-DPS-K01-X ETC-DPS-K01 ETC-DPS-K01-X	Storage + (Temperature) channel	M9

SR. No.	Model No.	Details	Model No Code
11	ETS-DPM-K40 ETS-DPM-K40-X ETC-DPM-K40 ETC-DPM-K40-X	Modbus + DP channel	M10
12	ETS-DPM-K41 ETS-DPM-K41-X ETC-DPM-K41 ETC-DPM-K41-X	Modbus + (DP + Temperature) channel	M11
13	ETS-DPM-K43 ETS-DPM-K43 -X ETC-DPM-K43 ETC-DPM-K43 -X	Modbus + (DP + Temperature + Humidity) channel	M12
14	ETS-DPM-K03 ETS-DPM-K03-X ETC-DPM-K03 ETC-DPM-K03-X	Modbus + (Temperature + Humidity) channel	M13
15	ETS-DPM-K01 ETS-DPM-K01-X ETC-DPM-K01 ETC-DPM-K01-X	Modbus + (Temperature) channel	M14





Note:

*In above table **Model No Code** used as abbreviations to respective model number in manual contents*

In model number, Suffix X indicates external Sensor.

Keypad Functions:

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

KEY	Description
SEL 	<ul style="list-style-type: none"> • To enter into main Menu. • Press this key two times to exit from main menu. • This key used for exit from parameter setting.
INC 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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) Channel Display Mode.
- 2) User Menu Display mode.
- 3) Special Key Function Display Mode.

Details of Display modes:

1>Channel Display Mode:

- In this mode channel in alarm condition then Channel reading blinked.
- If used acknowledge alarm condition by key<ENTER>

2>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.

3>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 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)

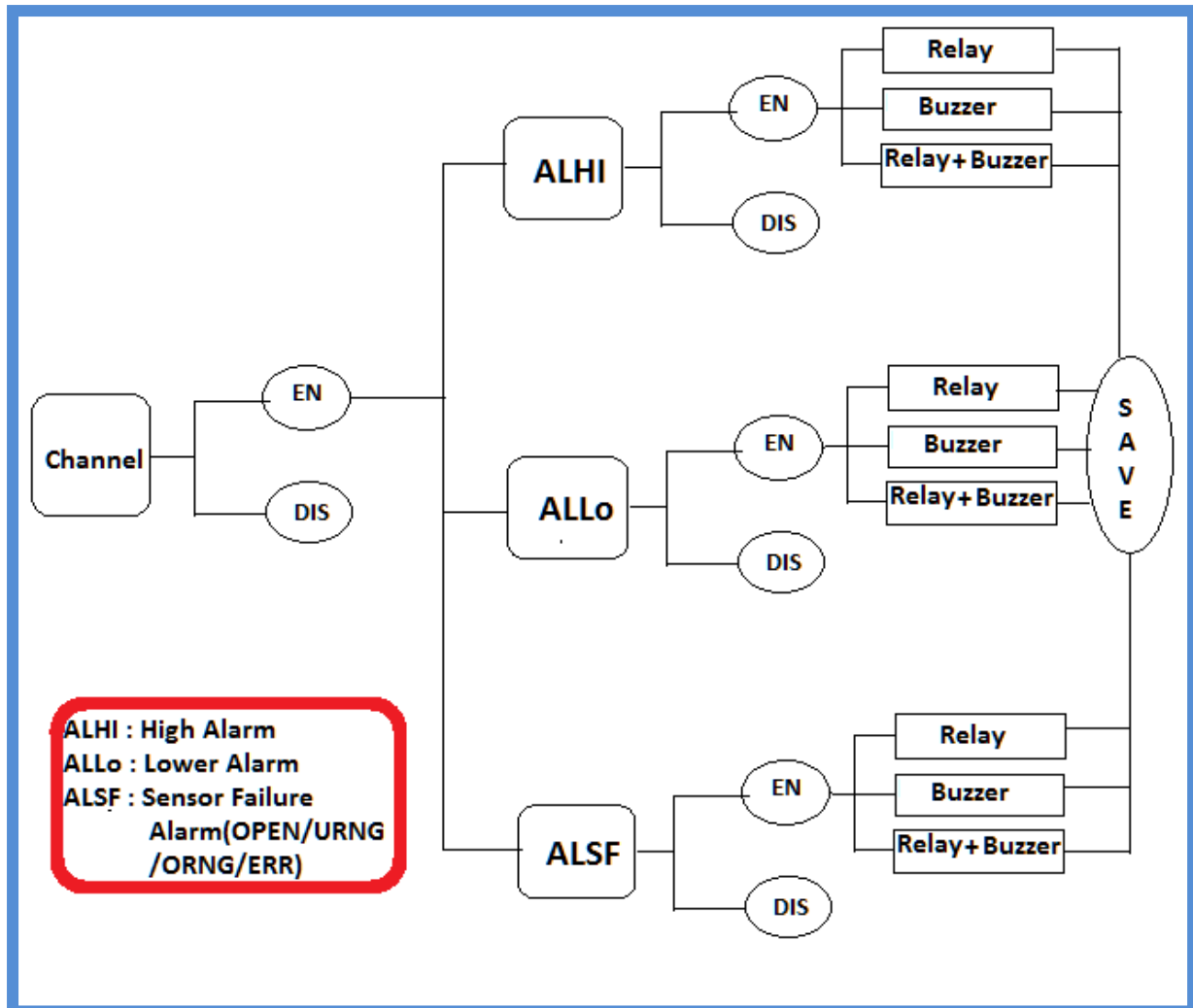
Output Configuration

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.



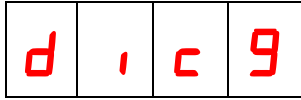
Alarm Snooze time

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.

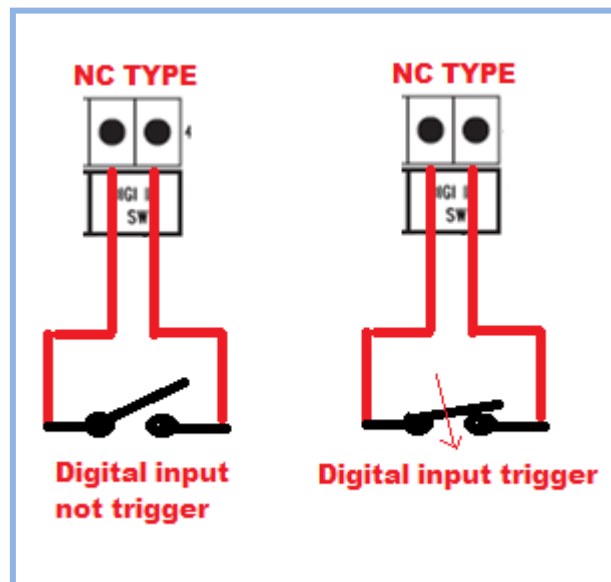
Digital input can be configured from Digital Input Configuration.



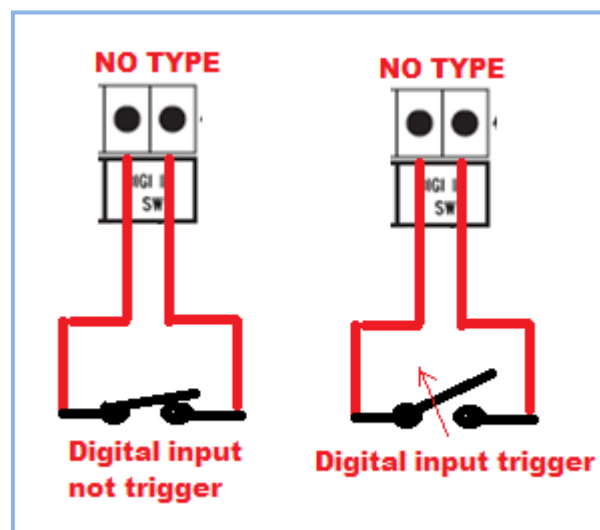
In this menu there are two types of contacts available.

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 on row 1 with description as follows:

SR. NO.	ROW 1 Display				Description	Applicable Model Code
1	A	d	L	9	To Access the menu of unit.	All Model Numbers
2	A	L	[	H	To set Set-Point and Hysteresis for each channel.	All Model Numbers
3	r	L	[	9	To set relay/inbuilt buzzer alarm status (enable/disable) for channel and relay/inbuilt buzzer assign for channel.	All Model Numbers
4	A	L	-	d	Set Alarm delay for DP channel	M0-M2,M5-M7,M10-M12
5	A	L	-	S	Set Alarm Snooze delay time	All Model Numbers
6	U	n	,	t	To set unit for each channel.	All Model Numbers
7	[	H	d	S	To enable/disable individual channel display.	All Model Numbers
8	r	-	H	L	Reset Minimum and Maximum value for all channels.	All Model Numbers
9	d	,	c	9	Set Digital Input Configuration	All Model Numbers
10	I	n	t	r	To set interval for storage of readings (for all channel Enable)	M5-M9
11	P	[	ii	r	Shows PC memory used.	M5-M9
12	r	-	P	[	To reset all memory.	M5-M9
13	d	S	U	n	To set Device ID of system.	All Model Numbers.
14	L	-	b	2	To set buzzer for menu keys & PC memory.	All Model Numbers
15	r	S	y	S	Reset system parameter to factory default	All Model Numbers

SR. NO.	ROW 1 Display				Description	Accessible in Model Code
16		d	t	t	To set date and time of device.	All Model Numbers
17	P	r	t	S	To select Enviro proprietary and Modbus protocol.	M10 to M14.
18		A	d	,	To set admin ID and Password if login with admin ID.	All Model Numbers
19	I	n	F	o	System Information	All Model Numbers
2.	b	A	[	-	Go to Channel Display mode.	All Model Numbers

To represent particular channel on display, following character used.

Display				Channel Description
		d	P	Differential Pressure Channel
			t	Temperature Channel
		r	H	Humidity Channel
		d	,	Digital Input Channel

Procedure to access different menu functions:

Admin Login Login

This function is used to access various Menu of DPMS. 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.

A	d	L	9

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

		1	d
		1	0

- 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.

P	A	S	S
			1

- Press "**ENTER**" to login.
- If the ID and Password is correct then DPMS display shows message as follow:-

Admin login

A	d	L	9
A	d	-	o

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

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

Admin login

A	d	L	9
F	A	I	L

- 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:

A	d	L	9

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

SR No	Description	Key to be pressed	Display				Action	Note	
1	To set Alarm Set-Point and Hysteresis for each channel. <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	A	L	[H	Enter into Set Point and Hysteresis menu	<i>Select desirable channel by INC/DEC key. Channel Displayed depends upon Model Number.</i>	
					d	P			
		INC/DEC	A	L	[H	Select Channel		
					d	P			
						t			
					r	h			
					d	,			
		ENT	5	t	P	t	Current set point for selected channel displayed.		Set point Maximum & Minimum value depends upon sensor which is configured. For digital Input Channel user can select High/Low set point.
					2	9			
		INC/DEC	5	y	5	t	Change set point.		
					2	5			
		ENT	H	y	5	t	Current hysteresis for selected channel displayed			Alarm Hysteresis range. Min: 0 (no decimal) 0.0 (single point) Max : 200 (no decimal) 20.0 (single point) For Digital Input Channel This selection disabled.
			1	0					
INC/DEC	H	y	5	t	Change hysteresis.				
			1	2					
ENT	H	y	5	t	Selected Alarm set point and	After save message displayed press			

			S	A	U	E	hysteresis for channel saved.	INC/DEC key to select next channel. Press SEL key once to access further menu or to exit to normal screen press SEL key twice.	
2	Relay & Internal Buzzer Configuration	ENT	r	L	C	9	Enter into Channel Relay Configuration menu.		
					d	P			
	<i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	INC/DEC	r	L	C	9	Press INC/DEC channel to scroll to particular channel. Press ENT to select the channel.	Select desirable channel by INC/DEC key. Channel Displayed depends upon Model Number.	
					d	P			
									t
						r			h
						d			,
		ENT	r	L	C	9	Current Status of Selected channel for Alarm Enable/Disable displayed.	If Enable selected, then further option get displayed.	
					E	n			
		INC/DEC	r	L	C	9	Use INC/DEC to Enable/Disable channel for Alarm configuration.		
					d	,			S
		INC/DEC	r	L	C	9	If channel is enabled than Choose the alarm condition from the menu. i.e. 1.upper alarm 2.lower alarm 3. Sensor failure. ALH , Upper alarm ALLo Lower alarm ALSF Sensor failure.	For all channels you can choose the 3 alarm condition. Sensor Failure alarm condition comes under following: 1>Sensor Under range 2>Sensor Over range 3>Sensor open (Sensor Not Connected.)	
			A	L	H	,			
			A	L	L	o			
			A	L	S	F			

		ENT	r	L	[	9	Current Status of Selected channel Alarm Parameter Enable/Disable displayed.	There is Enable/Disable Setting for each Alarm Condition: ALHi Upper alarm ALLo Lower alarm ALSF Sensor failure.
		ENT			E	n		
		ENT	r	L	[	9	If Channel Parameter Disable selected then selected channel parameter disable for configuration.	If Disable option selected then selected parameter disable for selected channel.
		ENT	S	A	u	E		
		INC/DEC	r	L	[	9	If Channel Enable then select following option displayed for output to be configured for channel. RLBZ Relay + Buzzer rl Relay Bz Buzzer	To Configured different channel press SEL key once.
		INC/DEC	r	L	b	2		
		INC/DEC			r	L		
		ENT	r	L	[	9	Save the changes.	
		ENT	S	A	u	E		
3	Set Alarm delay for DP channel (Accessible in M0-M2,M5-M7,M10-M12) ADMIN LOGIN	ENT	A	L	-	d	Current DP channel alarm delay Displayed.	
		ENT				1		
		INC/DEC	A	L	-	d	Change alarm delay time	Alarm Delay Range : 0 : Disable Min : 1 seconds Max : 9999 seconds
		INC/DEC				2		
		ENT	A	L	-	d	Selected DP channel alarm delay saved	Press SEL key once to access further menu or to exit to normal screen press SEL key twice.
		ENT	S	A	u	E		

4	Set Alarm Snooze delay for DP channel	ENT	A	L	-	5	Alarm Snooze delay time displayed.	
						1		
		INC/DEC	A	L	-	5	Change Alarm Snooze delay	Alarm Delay Range : 0 : Disable Min : 1 seconds Max : 9999 seconds
						2		
		ENT	A	L	-	5	Alarm Snooze delay time Saved.	Press SEL key once to access further menu or to exit to normal screen press SEL key twice.
			S	A	u	E		
5	Channel Unit Selection <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	U	n		t		
					d	P		
		INC/DEC	U	n		t	Select Channel	Select desirable channel by INC/DEC key. Channel Displayed depends upon Model Number.
					d	P		
						t		
					r	h		
		ENT	U	n		t		
			d	E	9	[
		INC/DEC	U	n		t	Change Channel Unit	There are total five units out of which suitable unit selected depend on channel type. UNIT 1 : degree Centigrade (Temperature Channel) UNIT 2 : degree Fahrenheit(Temperature Channel)
			d	E	9	[
			d	E	9	F		

					r	H		UNIT 3 : % Relative Humidity(RH)	
					P	A		UNIT4: Pascal(Pressure)	
				ñ	ñ	€		UNIT 5 : millimetre of water(Pressure)	
		ENT	U	n	l	t	Selected unit for channel saved.	After save message displayed press INC/DEC key to select next channel. Press SEL key once to access further menu or to exit to normal screen press SEL key twice.	
			S	A	u	E			
6	To enable/disable individual channel display. <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	€	H	d	S			
					d	P			
		INC/DEC	€	H	d	S	Select Channel		<i>Select desirable channel by INC/DEC key. Channel Displayed depends upon Model Number.</i>
					d	P			
						t			
					r	h			
					d	,			
		ENT			d	P	Current status of Display Enable for reading displayed.		
					E	n			
		INC/DEC			d	P	Enable/Disable Channel for display.		
					E	n			
		ENT			d	P	Save Setting		
S	A		u	E					

		INC/DEC		d	,	P	Enable/Disable Channel for display.	
				d	,	S		
		ENT			d	P	Save Setting	
			S	A	u	E		
7	Reset Minimum and Maximum value for all channels. <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	r	-	H	L	Enter to Menu	
			U	S	E	r		
		INC/DEC	r	-	H	L	Select Reset Min/Max of all channel by two way: 1>Reset Now 2>Reset By Day automatically.	
			U	S	E	r		
				d	A	Y		
		ENT	U	S	E	r	If reset by USER option selected then All Channel Min/Max reseted.	
					d	n		
		ENT		d	A	Y	If reset by day option selected then Current Status of reset by day displayed.	
					E	n		
		INC/DEC		d	A	Y	Enable/Disable Setting.	
				d	,	S		
		ENT		d	A	Y	Save Setting.	
			S	A	u	E		
8	Digital I/P configuration.	ENT	d	,	[	9	Digital I/P settings.	
				A	c	ü		

<p><i>(Accessible in all Model Numbers)</i></p> <p>ADMIN LOGIN</p>	INC/DEC	d , [9	INC/DEC to select from the menu	Digital Input can be configured for following one at a time :
		A c ñ		Alarm Acknowledgment.
		d o o r		Door Input for DP Channel
		S E n		Digital Input Sensor
		d , 5		Disable
	ENT	d , [9	If Digital Input configuration Enable then Current Status displayed.	
		n c		
	INC/DEC	d , [9	Select from the menu	Input type
		n c		Normally Close type Contacts.
		n o		Normally Open type Contacts.
	ENT	d , [9	If anyone is selected then it will ask to save. ENT to save.	
		S A u E		
	ENT	d , [9		
		d o o r		
	ENT	d , [9	Again it will ask for NC or NO. SELECT required.	Mute & Dot timer Range : 0 : Disable Min : 1 seconds Max : 9999 seconds
n c				
ENT	d o t	Select the door open time in seconds.		
	7			
ENT	d o t	ENT to save the data.		

			S	A	u	E		
		ENT	d	,	[	9	ENT to select the menu to disable digital I/P.	
				d	,	5		
		ENT	d	,	[	9	ENT to save the settings.	
			S	A	u	E		
9	To set interval for storage of readings (for all channel Enable) <i>(Accessible M5-M9.)</i> ADMIN LOGIN	ENT	l	n	t	r	Current Interval for channel data storage displayed	
						1		
		INC/DEC	l	n	t	r	Change Time interval	Time interval Range : Min : 1 min Max : 255 min
						2		
		ENT	l	n	t	r	Selected Time interval saved	Press SEL key once to access further menu or to exit to normal screen press SEL key twice.
			S	A	u	E		
10	PC memory used. <i>(Accessible in M5-M9)</i> ADMIN LOGIN	ENT	P	[	n	r	PC memory in percentage display in row 2	
						5		
11	To reset all memory. <i>(Accessible in M5-M9.)</i>	ENT	r	-	P	[	Device ask for reset all PC memory	
			r	A	L	L		
		ENT	r	-	P	[	Device ask for confirm to reset	

	ADMIN LOGIN			Y E S	PC.	
		INC/DEC	r - P [	n o	To select weather to reset PC memory.(YES/NO)	For “no” option selected SELF (select other menu) displayed. Press SEL key once to access further menu or to exit to normal screen press SEL key twice.
		ENT	r - P [	d n	PC memory reseted.	
12	To set Device ID of system. <i>(Accessible in all model numbers.)</i> ADMIN LOGIN	ENT	d S U n	i	Current Device ID displayed.	
		INC/DEC	d S U n	3	Change device ID	Device ID range : Min : 1 Max : 255
		ENT	d S U n	S A u E	Selected device ID saved.	Press SEL key once to access further menu or to exit to normal screen press SEL key twice.
13	To set buzzer for menu keys & PC memory. <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	L - b 2	E - U 1	Enter into buzzer configuration menu.	
		INC/DEC	L - b 2		Navigate through different buzzer configuration.	Different Buzzer Configuration :
			E - U 1			Enable Keypad buzzer
			E - P [			Enable PC memory high buzzer
			E - U P			Enable Keypad buzzer & PC memory buzzer.
			b d , S			Disable all buzzer configurations.

		ENT	L	-	b	2	Save selected settings.	
			S	A	u	E		
14	Reset system parameter to factory default.	ENT	r	S	y	S	Device ask for reset all system settings and configuration.	
			r	A	L	L		
	ENT	r	S	y	S	Device ask for confirm to reset.		
			y	E	S			
	INC/DEC	r	S	y	S	To select weather to reset.(YES/NO)		
				n	o			
ENT	r	S	y	S	System and configuration Reseted.			
			d	n				
15	Set date and time.	ENT		d	t	t	Set date and time.	Press DEC key to go to month or year from day. Press INC key to change the date, month, year or time.
		ENT			d	d	Change date by pressing INC key.	
					2	7		
		DEC			11	11	Change month by pressing INC key	
					1	0		
DEC			y	y	Change year by pressing INC key			
			1	4				
DEC			h	h	Change hour by pressing INC key			

					1 0		
		DEC			11 11	Change minute by pressing INC key	
					1 1		
		DEC			u d	ud is week of the day if 1 equals Sunday, then 2 equals Monday, and so on.	
					1		
		ENT			u d	Save the changes.	
			S A	u E			
16	Protocol Selection. <i>(Accessible in M10 to M14.)</i> ADMIN LOGIN	ENT	P r	t S		Current Selected protocol displayed	
			E n	u			
		INC/DEC	P r	t S		Modbus Protocol selection	
			11	o d			
			E n	u		Enviro Protocol Selection	
		ENT			11 o d	Save Protocol selection	
			S A	u E			
17	To set admin ID and Password if login with admin ID.	ENT	A d	,		Enter into Admin ID and password change menu	ID and Password Range: 0 to 255.
		ENT		,	d			Display current ID

	<i>(Accessible in All Model Numbers)</i> ADMIN LOGIN					0				
		INC/D EC					1	Change ID.		
							1			
		ENT	P	A	S	S			Display Current Password	
					3	0				
		INC/D EC	P	A	S	S			Change Current Password.	
					2	2				
		ENT	P	A	S	S			Save Selected ID and Password.	
			S	A	U	E				
18	To get System Software and hardware version. <i>(Accessible in All Model Numbers)</i> ADMIN LOGIN	ENT	I	n	F	o				
		ENT	[	r					Software Version Displayed	3.0.00= Software Version
			3.	0.	0	0				
		INC/ DEC	[	r					Hardware Version Displayed	2.0= Hardware Version
			2.	0						

Special Short key events

- 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.

While in channel display mode if user press INC key more than 3 seconds then channel maximum value get displayed as follows:

H		d	P
			9

Here **H** represents channel maximum indication, **DP** indicates DP channel and **9** indicates DP channel maximum value.

L		d	P
			0

Here **L** represents Channel minimum indication, **DP** indicates DP channel and **0** indicates DP channel minimum value.

H		d	P
S	A	u	E

L		d	P
-	-	-	-

Here ---- indicates problem with sensor or required to reset channel Maximum and Minimum value

❖ Channel alarm acknowledgment

- If ENTER key pressed more than 3 seconds then Acknowledgment of alarm channel taken.

If ENTER press in Channel Display mode then following screen displayed.

A	L	E	H
1.		3.	

As shown above, channel 1 and 3 acknowledgments taken represented by dot near channel number. While Channel 2 and 4 in normal condition (no alarm).

Meaning of 1 and 3 in above display.

1: channel 1

2: channel 2

3: channel 3

4: channel 4

After Acknowledgment taken, display return to channel display mode.

Modbus Protocol

DPMS 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	Buad 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	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	Process Value	Channel 2	2	
40003	READ	Process Value	Channel 3	2	
40004	READ	Process Value	Channel 4	2	
40005	READ	Maximum 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
40006	READ	Minimum Value	Channel 1	2	
40007	READ	Maximum Value	Channel 2	2	
40008	READ	Minimum Value	Channel 2	2	
40009	READ	Maximum Value	Channel 3	2	
40010	READ	Minimum Value	Channel 3	2	
40011	READ	Maximum Value	Digital Input	2	
40012	READ	Minimum Value	Digital Input	2	
40013	READ/WRITE	Alarm Set Point	Channel 1	2	1>Alarm Set point Range depends on Sensor Connected. Hysteresis Range : # 0 to 200(Without decimal) # 0.0 to 20.0(With decimal) 2>In case of Digital Input 0 : Low 1 : High
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	Digital Input	2	
40020	READ/WRITE	Alarm Hysteresis	Digital Input	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	
40025	READ	Decimal Point	Channel 1	2	Decimal Point 0 : No Decimal Point 1 : One Decimal Point 2 : Two Decimal Point
40026	READ	Decimal Point	Channel 2	2	
40027	READ	Decimal Point	Channel 3	2	
40028	READ	Decimal Point	Channel 4	2	
40029	READ	Channel Unit	Channel 1	2	0 : for Pascal/°C(Centigrade) /%RH/Digital Input 1 :for mmWC/ °F(Fahrenheit) Channel unit depends upon type of channel
40030	READ	Channel Unit	Channel 2	2	
40031	READ	Channel Unit	Channel 3	2	
40032	READ	Channel Unit	Channel 4	2	

40033	READ/WRITE	DD		2	To set date and time in 24 hour. DD→ Date MM→ Month YY→ Year HH→ Hour MM→ Minutes SS→ Seconds WOD→ Week of Day
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	

Modbus register details

Register address	40001 to 40004
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Details

This register provide process value details of respective channels .Relationship between process value and decimal point(40025 to 40028) as follows :-

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
40025	To read decimal point 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
40025	0	Pressure value without decimal point
40029	0	Pressure unit is Pascal

In above case Real value of pressure is 25 Pascal without decimal point.

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

Register address	Use
40001	To read Process value of DP channel
40025	To read decimal point 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	35	Pressure value 35
40025	1	Pressure value with decimal point
40029	1	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
40026	To read decimal point of temperature channel
40030	To read unit of temperature channel

Following table demonstrates Pressure channel real value calculation.

Register address	Register data after read	Data to be predicted
40002	285	Pressure value 285
40026	1	Pressure value with decimal point
40030	0	Pressure unit is °C

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

Register address	40005 to 40012
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Details

This register provide Channel Minimum/Maximum value details of respective channels .Relationship between process value and decimal point(40025 to 40028) as follows :-

Example

1> In case of Pressure channel, we can read following address to get channel minimum value.

Register address	Use
40006	To read channel minimum value of DP channel
40025	To read decimal point 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
40006	2	Pressure value 2
40025	0	Pressure value without decimal point
40029	0	Pressure unit is Pascal

In above case Real value of pressure minimum value is 2 Pascal without decimal point.

2>In case of Pressure channel, we can read following address to get channel maximum value.

Register address	Use
40005	To read Channel minimum value of DP channel
40025	To read decimal point 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
40005	25	Pressure value 25
40025	0	Pressure value with decimal point
40029	0	Pressure unit is mmWC

In above case Real value of pressue maximum value is 25 Pascal without decimal point.

Register address	400013 to 40020
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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.

Example:

If we want to write data to DP channel set point then address is **40013**.

Pressure Value	25 Pascal	5.4 mmWc	2.3 mmWc
Decimal Point	0	1	1
Data to be write in decimal	25	54	23
Data to be write in Hex	19	36	17

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:-

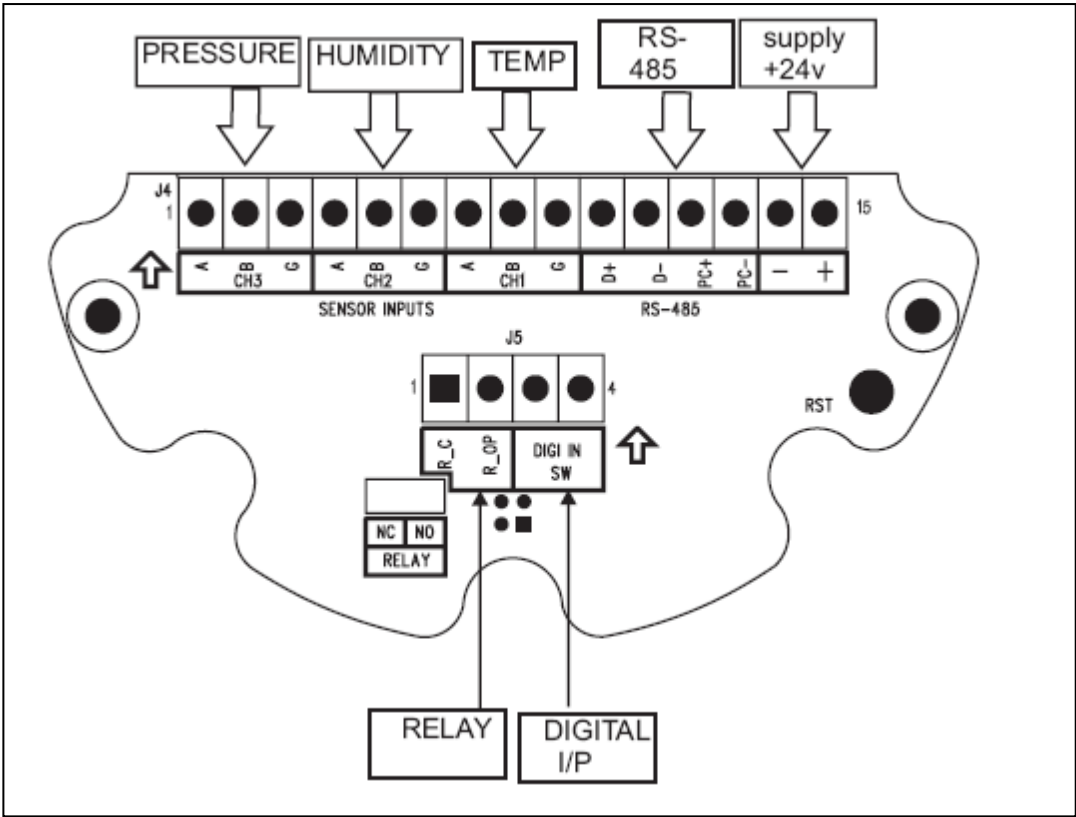
Alarm Bit	:	Alarm Type	Description
0	:	No Alarm	Normal Condition
1	:	Upper Alarm	Upper alarm Condition
2	:	Lower Alarm	Lower alarm Condition
3	:	NA	NA
4	:	NA	NA
5	:	URNG	Sensor Under range condition
6	:	ORNG	Sensor Ove range condition
7	:	OPEN	Sensor Open condition

Register address	40025 to 40028
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Details

Decimal Point represents decimal point used in channel Process value/Set point/Channel Minimum& Maximum value.

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.

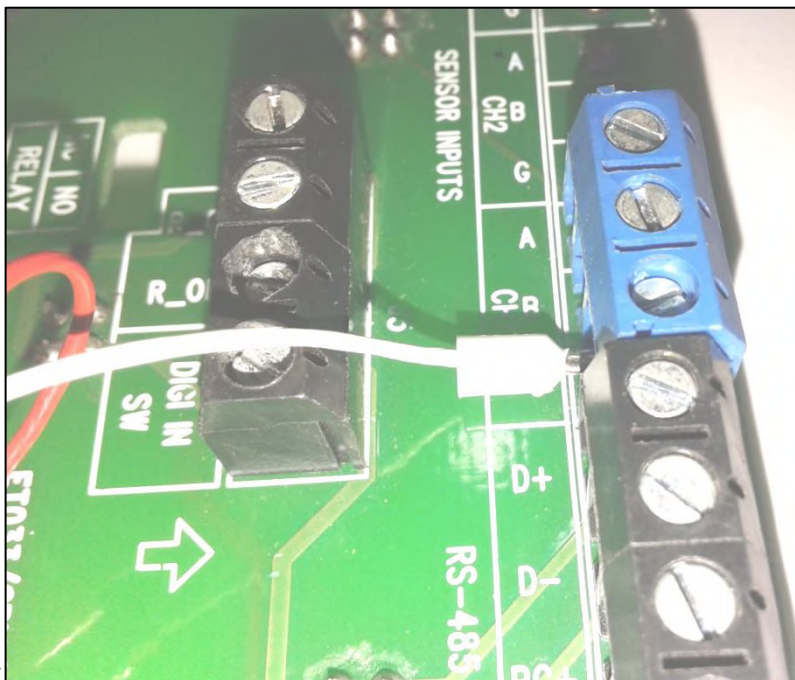
Power Supply: 24Volt,125mA		
Pin No.	Legend	Description
1	+	Positive
2	-	GND

PC COMMUNICATION		(RS 485)
Pin No.	Legend	Description
1	PC+	For communication with PC.
2	PC-	
3	D+	To connect Remote display.
4	D-	

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

External Sensor connection		
Channel No.	Legend	Description
1	CH 1	To connect temperature sensor
2	CH 2	To connect humidity sensor
3	CH 3	To connect pressure sensor

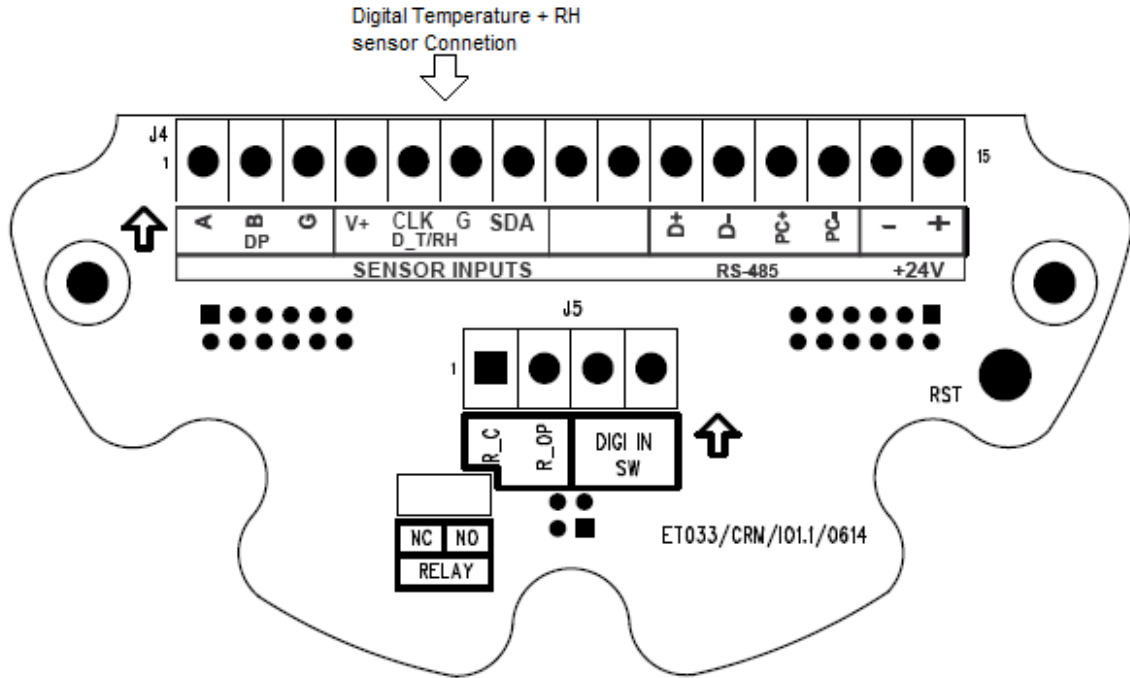
Channel 1 (Temperature sensor -PT 100)		
Pin No.	Legend	Description
1	A	RED
2	B	WHITE
3	G	WHITE



Channel 2 (Humidity sensor-Devanshi electronics)		
Pin No.	Legend	Description
1	A	RED
2	B	WHITE
3	G	BLACK

Channel 1 & 2 (Temperature & Humidity sensor –Rotronix hydroflex) Retransmission type.		
Pin No.	Legend	Description
1	A	RED
2	B	BLACK

Digital Temperature Humidity Connection Details:



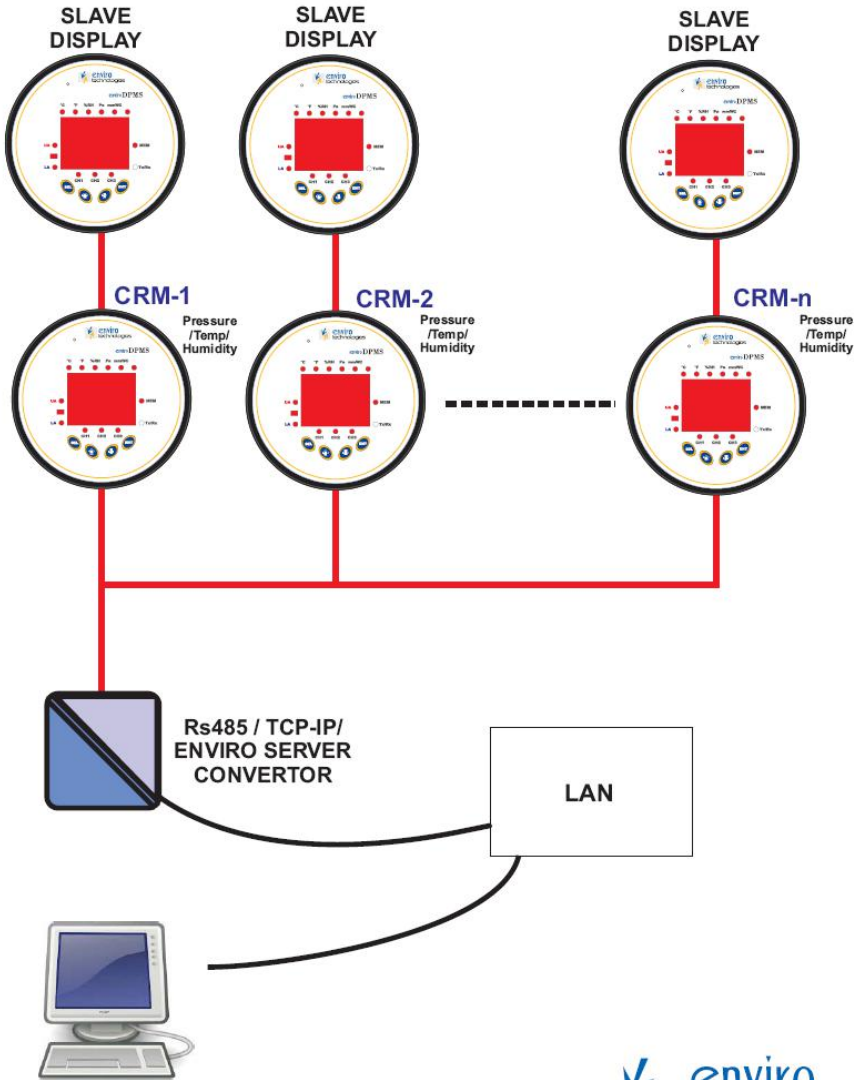
Digital Inbuilt Temperature + RH Connection Details.	
Legend	Description
V+	RED
CLK	YELLOW/ORANGE
G	BLACK
SDA	GREEN/BROWN

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

Pressure pipes connection		
Nosel	Legend	Description
1	P+	Pressure to be measured
2	p-	To the reference



CLEAN ROOM MONITORING SYSTEM



Installation Note:

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

- All cables connecting to DPMS 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.
- 0 to 1V humidity sensor cable length: 3 meter max (keep as short as possible.)
- 0 to 3.3V humidity sensor cable length: 3 meter max (keep as short as possible for more accuracy in reading.)
- 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 DPMS display mode properly. 2. Check particular channel is enabled properly. 3. Check all sensor pins are connected properly.
2.	Sensor connections	4. PT100 and Humidity 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.(eg S-PC or S-UP).
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")