PMD33/34 Differential Pressure Transmitter Operation Manual   V01

Product description

Transmitter for differential pressure measurement. Membrane technology sensor.

The main application area for the PMD33 is going to be clean-rooms, but also other applications such as control of pressure drop, energy management systems or HVAC can be considered as target markets. The PMD33 is best economic option to the market.
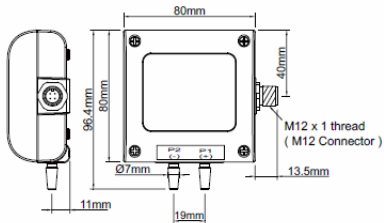
Product Characteristics

- Range from -50/+50Pa to -7500/+7500Pa
- RS-485 Communication Interface, Modbus RTU protocol.
- 4-20mA or 0-10V output, power supply 8-35Vdc or 12-30Vac
- IP65, with or without LCD display
- Computer fixing for linearity.
- High stability & repeatability.

Technical Data

| Parameters	Differential pressure
Sensor technology	Piezoelectric Differential Pressure Module
Measuring Units	mbar, Pa, hPa, kPa, mmH2O, mmWS, inH2O, mmHg
Measuring Range	min -50/+50Pa, max -7500/+7500Pa
Output Signal 3-wire	0-20mA / 4-20mA / 0-1V / 0-5V / 1-5V / 0-10V / 2-10V
Total Accuracy over full range	± 1 % of F.S.
Load Impedance (Current output)	＜ 500Ω
Load Impedance (Voltage output)	≧ 10KΩ
Filter	0, 5, 10, 20, 25 seconds
Autozero	Manual with push button
Display	LCD 8*2 digits
Power Supply	8~35VDC or 12~30VAC
Electronic Protection	Overvoltage/ Reverse Protection
Certification:	CE
IP-Protection	IP 65
Housing Material:	PC fire-proof
Working Temperature	0 ~ 50℃
Storage Temperature	-20 ~ +60 ℃
Environment Humidity	< 95 % RH (Non-Dewing Condition)

Dimension (mm)
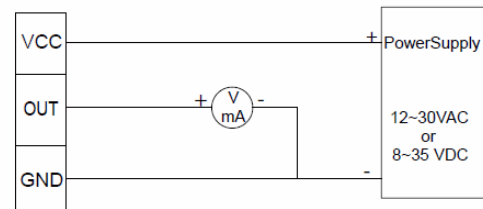

Indoor — M type
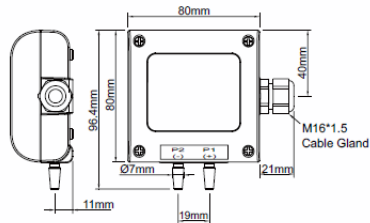
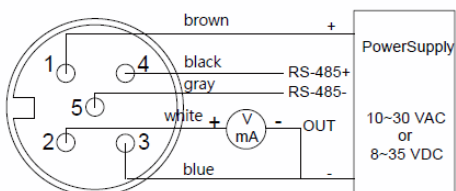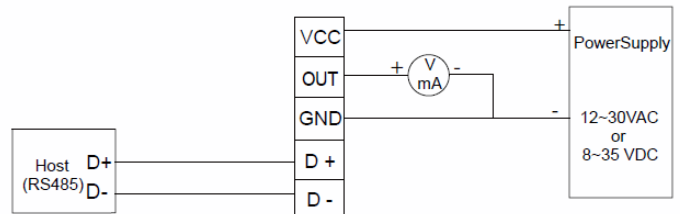Indoor — N type
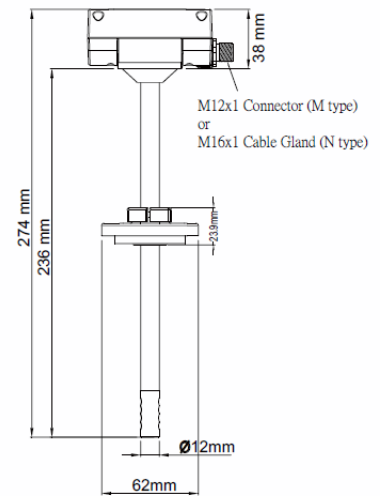
Duct

Connection Diagram
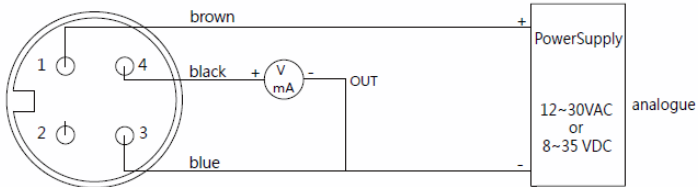
4P M12 Connector + Analogue

3P Terminal, Analogue

5P M12 Connector + RS-485

5P Terminal, Analogue + RS-485

DIP Switch

For PMD33, the setting status of DIP switch will be read by software while power on, and this reading action will not happen later on. Thus in order to read the DIP switch status again by firmware, the user must to reboot again if re-setting the DIP switch.

Function List

- Switch_1   DIP switch Active / Deactivate
- Switch_2   0-10V / 4-20mA
- Switch_3,4   Maximum measuring value
- Switch_5,6,7   Units
- Switch_8   Central range
- Switch_9   Square Root Extracted
- Switch_10   Filter 1 second
- Switch_11,12   Station ID 1-4

DIP Switch Active / Deactivate

The function of DIP Switch_2 ~ 12 only be effective while setting the DIP switch_1 as "On".

The transmitter setting is factory default or by software if DIP switch_1 as "Off".

O: On, X: Off

DIP switch	Switch_1
Deactivate	X
Active	O

Analog Output setting

4-20mA or 0-10V for output setting

O: On, X: Off

Output	Switch_2
4-20mA	X
0-10V	O

Maximum Measuring value setting

Three fixed values could be selected by DIP switch. Example, the number 0.5 on the table (mbar, Switch_3 and Switch_4 both Off) is represented +100% of measuring value.

One flexible measuring range support by factory default or user software setting as Switch_3 and Switch_4 both On. In this setting, the Central range setting for Switch_8 will be ignored and the measuring range is setting as factory default or user software.

O: On, X: Off

Switch	3		4		3		4		3		4		3		4	
	X		X		O		X		X		O		O		O	
Unit\Range	10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40
Pa	50	300	1000	2500	100	500	1600	5000	250	1000	2500	7500	default or software setting			
mbar	0.5	3	10	25	1	5	16	50	2.5	10	25	75	default or software setting			
hPa	0.5	3	10	25	1	5	16	50	2.5	10	25	75	default or software setting			
kPa	0.05	0.3	1	2.5	0.1	0.5	1.6	5	0.25	1	2.5	7.5	default or software setting			
mmH2O	5	30	100	250	10	50	160	500	25	100	250	750	default or software setting			
mmWS	5	30	100	250	10	50	160	500	25	100	250	750	default or software setting			
inH2O	0.2	1.2	4	10	0.4	2	6.4	20	1	4	10	30	default or software setting			
mmHg	0.375	2.25	7.5	18.75	0.75	3.75	12	37.5	1.875	7.5	18.75	93.75	default or software setting			

Unit setting

Eight units is supported by transmitter: mbar, Pa, hPa, kPa, mmH2O, mmWS, inH2O and mmHg.

O: On, X: Off

Unit	Switch_5	Switch_6	Switch_7
mbar	X	X	X
Pa	O	X	X
hPa	X	O	X
kPa	O	O	X
mmH2O	X	X	O
mmWS	O	X	O
inH2O	X	O	O
mmHg	O	O	O

Central range setting

According maximum measuring value setting of Switch_3, 4 and unit setting of Switch_5, 6, 7, the central range sets the Bidirectional or unidirectional of measuring.

Example: the maximum measuring value is 0.5 and the unit setting is mbar

Switch_8 Off : -0.5 / +0.5 mbar

Switch_8 On : 0 / +0.5 mbar

O: On, X: Off

Range	Switch_8
Range: -100 ~ +100%	X
Range: 0 ~ +100%	O

Note: If Switch_3, 4 both On, then Central range setting will be ignored

Square Root Extracted setting

Root extraction is benefit for air velocity application. Measure the air velocity in the application with a reference instrument and work out the average velocity. LCD shown the √ mark on left-low side and red led of LDEP flash slowly while the square root extracted function has active.

The following formula can be used for converting a linear 4-20mA current loop signal to a square root extraction type:

$$Output_{SqRt} = 4mA + (4 \times \surd (Output_{Linear} - 4mA))$$

The formula for 0-10V to a square root extraction type:

$$Output_{SqRt} = \surd 10 \times \surd Output_{Linear}$$

O: On, X: Off

Status\No.	Switch_9
Linear	X
Square Root Extracted	O

Filter

Analog output filter setting for 1 second or disable.

O: On, X: Off

Status\No.	Switch_10
Filter off	X
1 second	O

Station ID setting for Modbus

Station ID for Modbus RTU slave device setting.

O: On, X:Off

Station ID	Switch_11	Switch_12
1	X	X
2	O	X
3	X	O
4	O	O

Note:

While setting the DIP switch_1 as "On", some of the "Setting" & "Output" features will be disabled on user software. In other word, these features are controlled by DIP switch. Otherwise, the features on UI can be configured if set the DIP switch_1 as "Off".

Button

AUTOZERO

This button allows user to set the current pressure to "AUTOZERO", it is required to press the button for 1~2 seconds, and the pressure adjusted to "AUTOZERO" after release this button. The user will observe the red led of LEDP turn on for the noticing zero function has active.

Factory default

This button allows user to restore factory default setting, it is required to press the button for 10 seconds, red led of LEDP turn to flash, the pressure offset and multiple factor will reset to 0 and 1 after release this button.

RS-485 and Modbus

PMD33 integrate a RS-485 interface for digital communication as a option feature. Based on Modbus protocol makes the general convenience on PLC, HMI and PC connection. For Modbus protocol information please attached the file from website to download. Besides the PLC, HMI application, the user software provide the device setting and data logging function, it also can free download from website.

Technical Data:

- Max. network size: 32 transmitters
- Communication: with COM-Port (serial interface) of PC
- Max. network expansion: 1200m (3937ft) total length at 9600 baud
- Transmission rate: 9600, 19200, 38400, 57600, 115200 Baud
- Parity: None, Even, Odd
- Data length: 8 bit
- Stop bit: 1 or 2 bit
- Factory default Station address = 1, Data format= 9600, N81

User Software

1. Hardware connection: Connect the PMD33 to PC by USB to RS-485 or RS-232 to RS-485 converter.

2. Check the COM port number from Computer Management
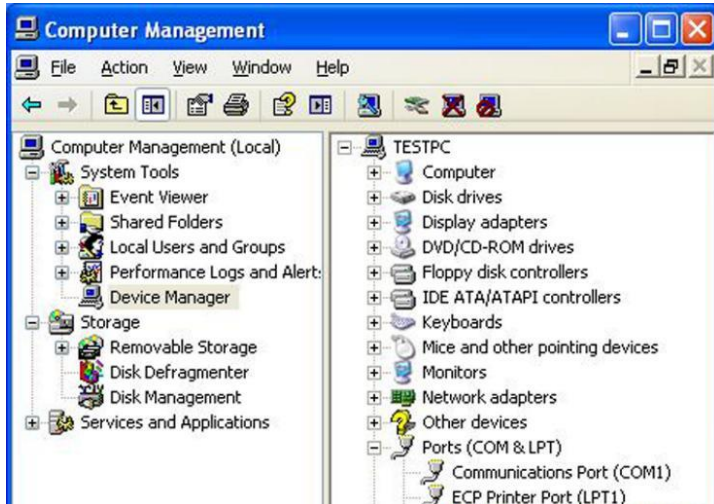
3. Open the PMS33_UI, go to function "Interface", click item "Config" and then setting COM port, BAUD rate and data format, pressed "Scan" bottom for scan devices and "Apply" for connection.
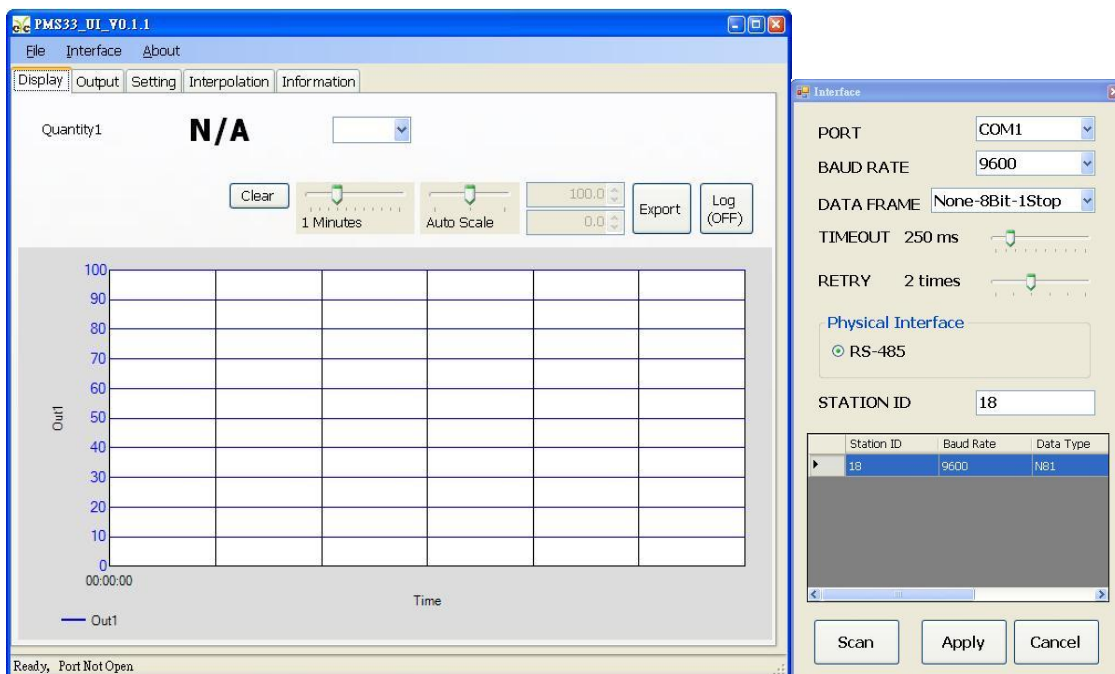
4. Setting on Analog Output

   i. Quantity: Pressure

  ii. Filter: 0, 5, 10, 20, 25 seconds

  iii. Signal: Linear / Square root extraction

> - LCD shown the V mark on left-low side and red led of LDEP flash slowly while the square root extracted function has active.

  iv. Analog type: 0-20mA / 4-20mA / 0-1V / 0-5V / 1-5V / 0-10V / 2-10V

  v. Range for Upper and Lower
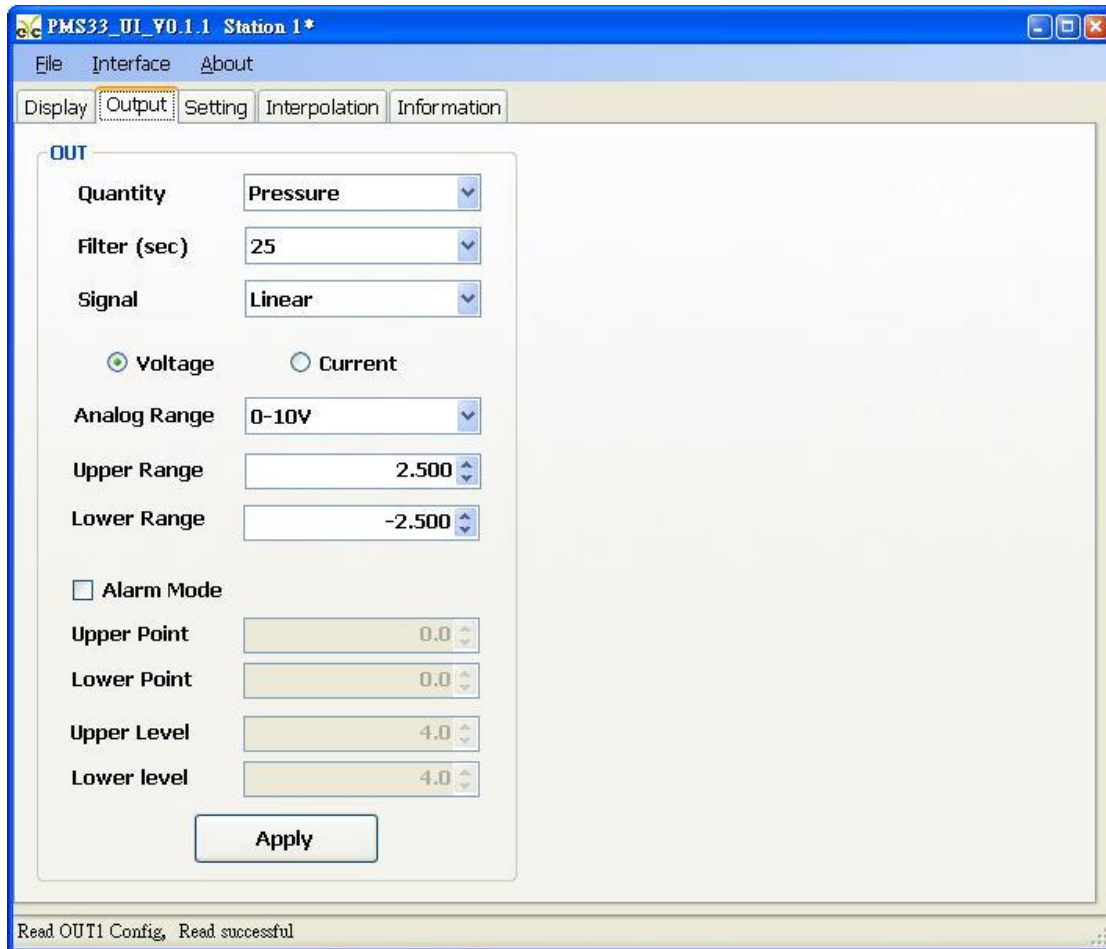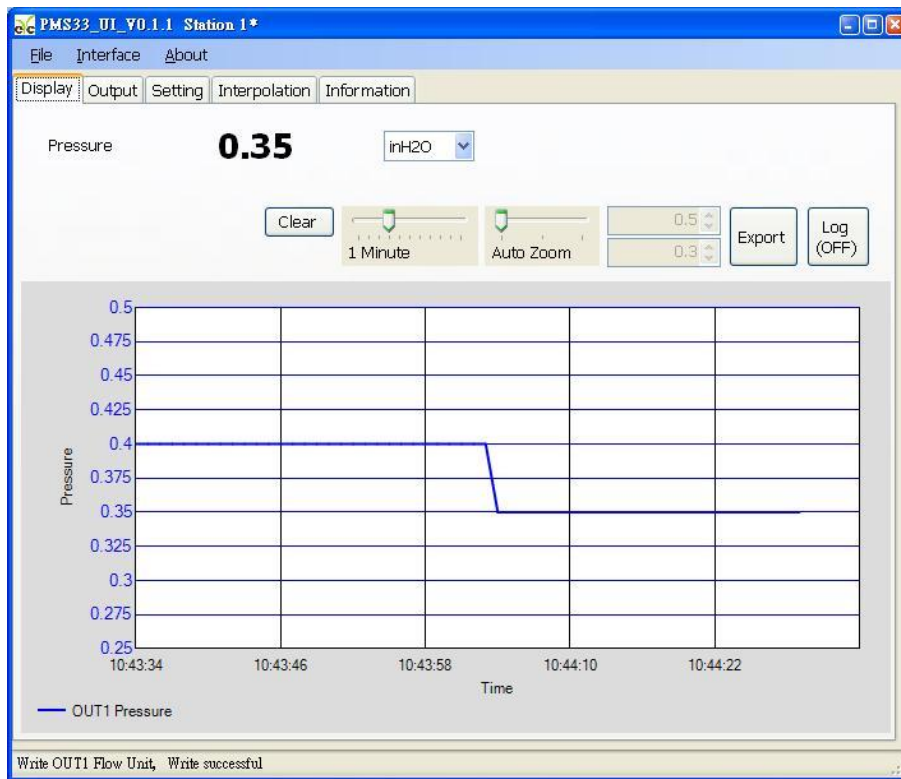
5. Setting on RS-485 and offset adjustment

   i. Station ID: 1~247

   ii. Baud Rate: 9600 / 19200 / 38400 / 57600 / 115200

   iii. Data Frame: None-8Bit-1Stop / None-8Bit-2Stop / Even-8Bit-1Stop / Even-8Bit-2Stop /
          Odd-8Bit-1Stop / Odd-8Bit-2Stop /

   iv. Pressure Offset adjustment, unit available in inH2O only

   v. Multiple on measuring value, from 0.01 to 100
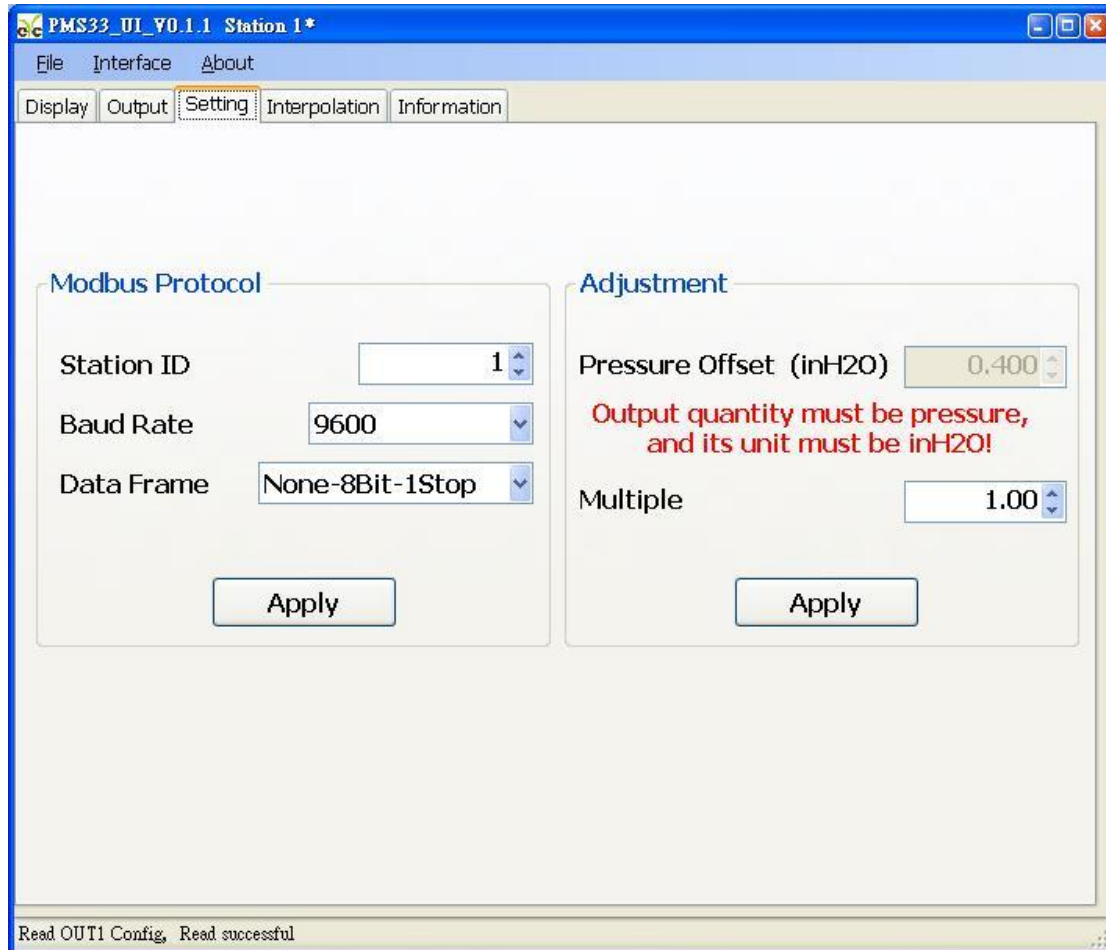
6.   Unit setting, data display and data logging

  i. Pressure unit: mbar, Pa, hPa, kPa, mmH2O, mmWS, inH2O, mmHg

  ii. Export file: *.CSV

7.   Transmitter information