

Descriptions

The Pressure Monitor is used to measure differential pressure in the range of +/-1 full Scale, +/-8inWC, 100PSI, 250PSI. It combines precision high sensitivity silicon sensing capabilities and the latest ASI C technology to substantially reduce offset errors due to changes in temperature, stability to warm up, long term instability and position sensitivity.

It features an LCD to display the pressure value and field-selectable output signal types for the most flexible application. The device has an on-board auto-zero function. It also features two optional output : PID control type and transducer type.



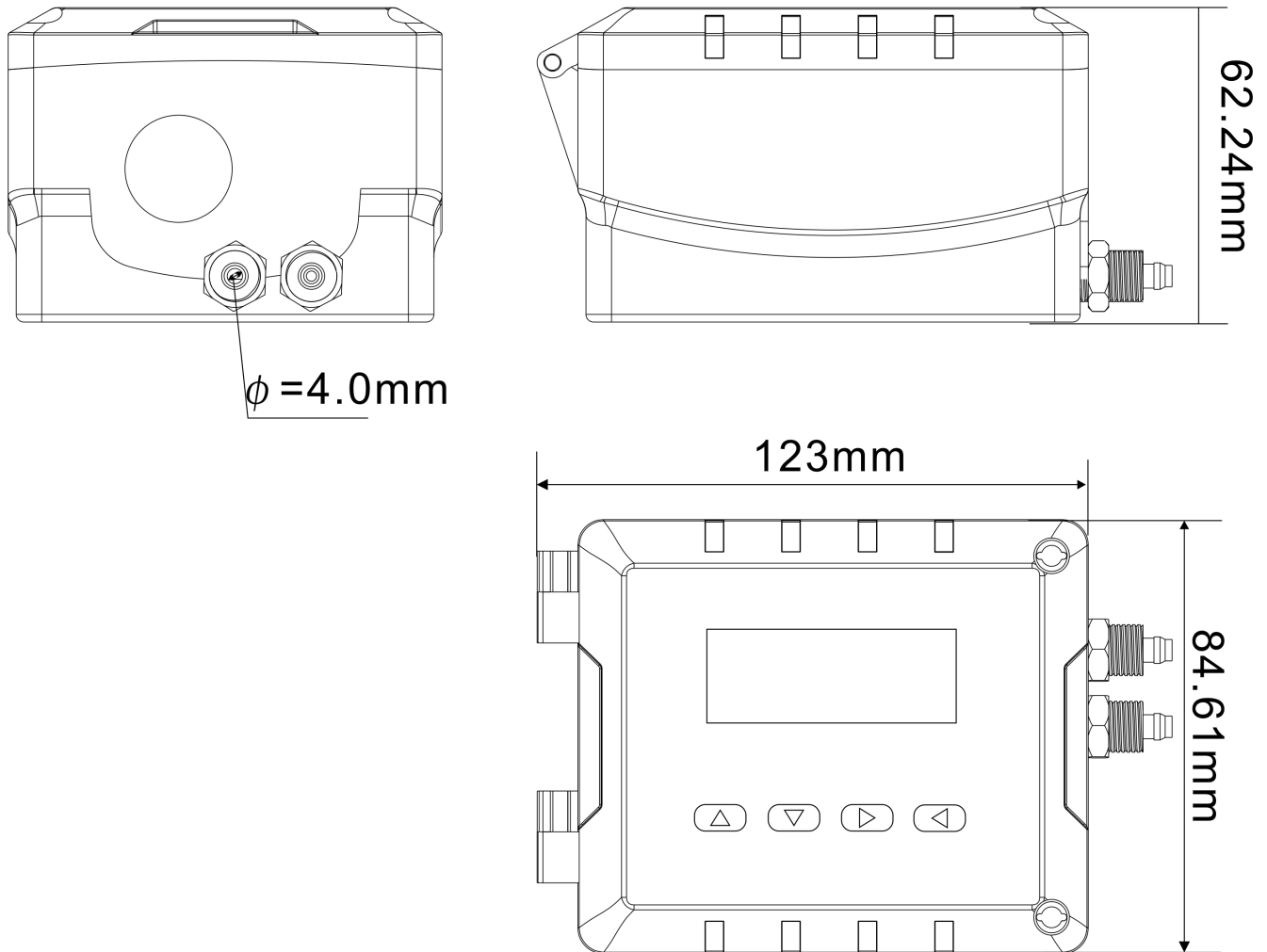
Features:

- LCD indication
- Jumper selectable outputs
- Precision silicon sensor
- Functional and attractive enclosure
- Installer friendly wiring access
- 2.5% Typical Error over +10C to +60C with Auto Zero
- 6.25% Maximum Error over +10C to +60C without Auto Zero
- Temperature Compensated over +10C to +60C
- Differential Input
- 8 units available: inWC, inHg, mmHg, PSI , atm, Bar, Pa, & kg/cm

Specifications

Supply Voltage	15~24VAC/DC ± 10%		
Power Consumption	50mA @ 12VDC		
Relay Contacts Rating	0.5A / 125VAC, 1A / 24VDC		
Analog Output	Analog outputs setting 0-5V, 0-10V, 4-20mA		
	Operating Temperature	Accurac	Operating Range
PS-1-0	0 ~ 70°C	+/-1.5% full scale	1inWC / 250 Pa
PS-8-0	10 ~ 60°C	+/-2.5% full scale	8inWC / 2 kPa
PS-100-1	-40 ~ +85°C	+/-0.5% full scale	100psi / 689kPa
PS-250-1	-40 ~ +85°C	+/-0.5% full scale	250psi / 1.7MPa
PS-100-1, PS-250-1 Wetted Parts: Silicon, should only be in contact with media such as water			
Enclosure	Flammability rating UL 94HB		

Dimension



Part Number Scheme

PS - 8 - 0 - 0

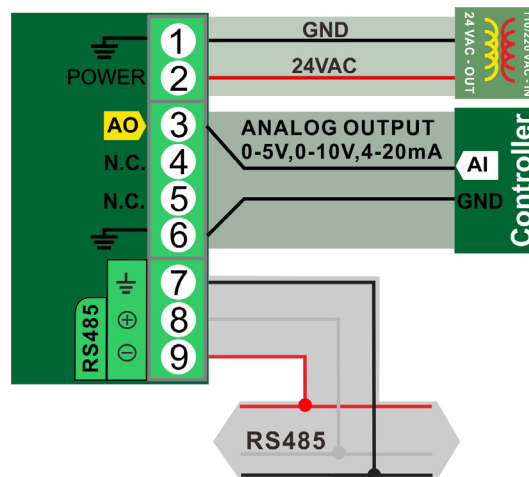
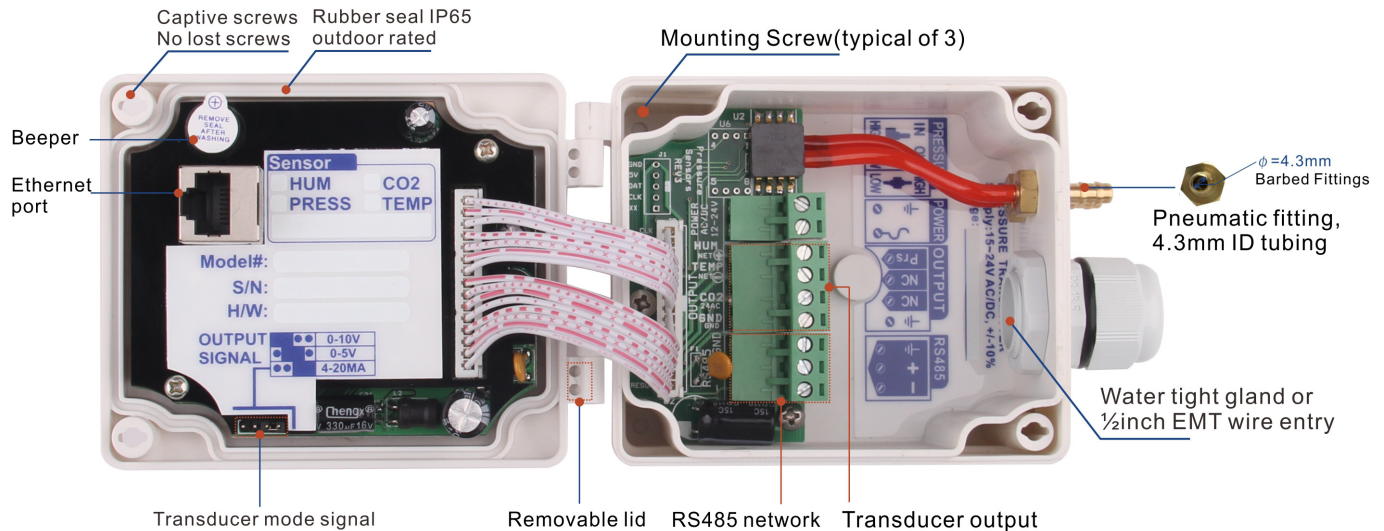
Code	Description
PS	Pressure Sensor

Code	Fittings
0	1/4in Barbed
1	1/8NPT

Code	Operating Range
1	1inWC / 250 Pa
8	8inWC / 2 kPa
100	100psi / 689kPa
250	250psi / 1.7MPa

Code	Medium
0	Dry Air
1	Air or water

Wiring&Highlights



Register List

Modbus

Pressure Sensor uses MODBUS protocol to communicate with others. Below is the register list.

Address	Bytes	Register and Description
6	1	ADDRESS. Modbus device address.
21	1	Protocol switch. 3 = MODBUS, 0 = Bacnet MSTP
185	1	Baudrate, 0=9.6kbaud, 1=19.2kbaud, 2=38.4kbaud, 3=57.6kbaud, 4=115.2kbaud, 5=76.8k
711	2	Pressure value reading.
...

Bacnet

Pressure Sensor also uses Bacnet protocol to communicate with others. Below is the register list.

Variable	Variable and Description
4	ID Address
8	Uart BaudRate.0=9.6kbaud, 1=19.2kbaud 2=38.4kbaud 3=57.6kbaud 4=115.2kbaud
10	Protocol
...

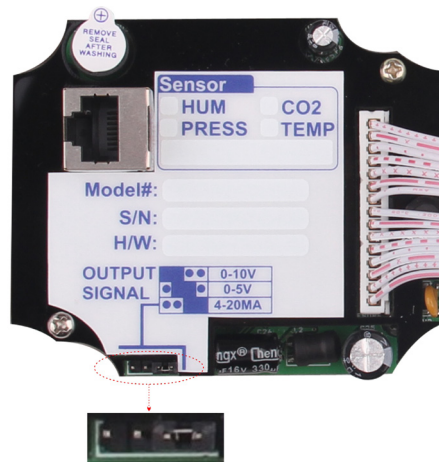
Input	Input and Description
4	Pressure

Output	Output and Description
1	Pressure analog output

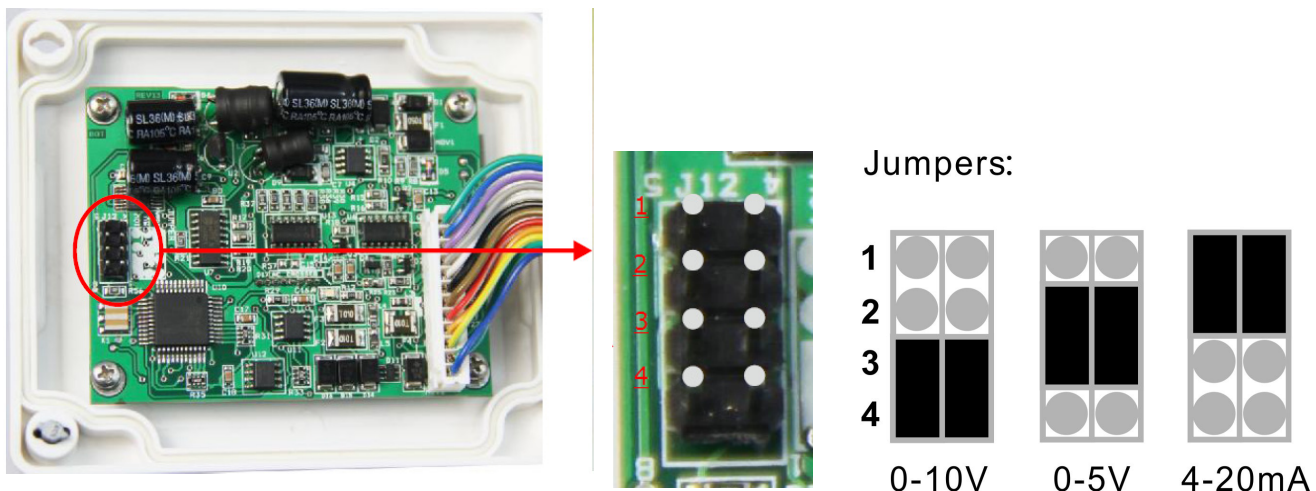
*For more register list details, please download an excel spreadsheet (ModbusBacnetRegisterList.xls) as the following link: <https://tinyurl.com/ybaj9d3u>.

Output Jumper Settings

In this mode the device acts as a traditional transducer where it sends out three analog signals, all you need to do is to set this one single jumper to the appropriate signal type: 4-20mA, 0-10V, or 0-5V.



PS/rev13 jumper settings



Instructions

1) How is it programmed to change the command value etc?

Mostly you'll want to use the T3000 front end to configure PI D. For simple transducer mode setups you can get by with just the keypad. The PI D setup will be too complex for the keypad I think, use T3000. You'd need an RS485 converter, there are a few on the web site. Current sensor name, do not need to be changed by user

2) There are four icons, two setpoints and two menus. Under the menu column, it provide you 7 choices.



Increase setpoint



Decrease setpoint



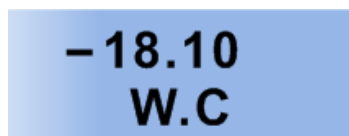
Previous item select



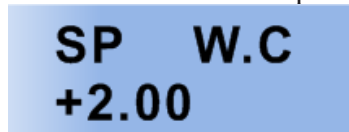
Next item select

PSensor Type	26PCDFA, MPXV7002
Prs_unit	W.C, bar, atm, kg/cm ² , inHg, KP, Psi, mmHg
Min/ Max	
Prs_c al	
Prs_mode	Diff, Gauge
Prs_def	Yes, No

3). Here are the instructions about how to use the key and together with some screen shot for the system.



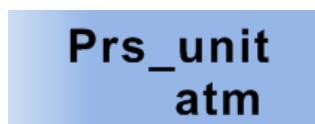
a. Normal state: show pressure value and unit.





b. When click or , it will increase or decrease setpoint.



c. Click or , it will go into item adjust item as the photo shows. Click or , you can select MPXV7002 or 26PCDDFA. Click or , go to the previous or next menu item.



- d. Click  or  to select the pressure unit.
- W.C(inches of water)
 - KP
 - PSI
 - mmHg
 - inHg
 - kg/cm2
 - atm
 - bar

Min bar
-10.00

and

Max bar
+8.00

e. Pressure range set: this relative with the output type.
 For example: if set output type to transducer mode(default mode):
 the output will be : $\text{output_type} * \text{current_pressure} / (\text{max_pressure} - \text{min_pressure})$
 output_type: 0-10V or 0-5V or 4-20mA.

Prs_cal
-0.02

- f. Pressure zero calibration: using  or  adjust current pressure to zero to do the zero calibration

Prs_mode
DIFF

and

Prs_mode
GAUGE

- g. Pressure sensor type selection: DIFFERENTIAL or GAUGE type






Prs_def
YES

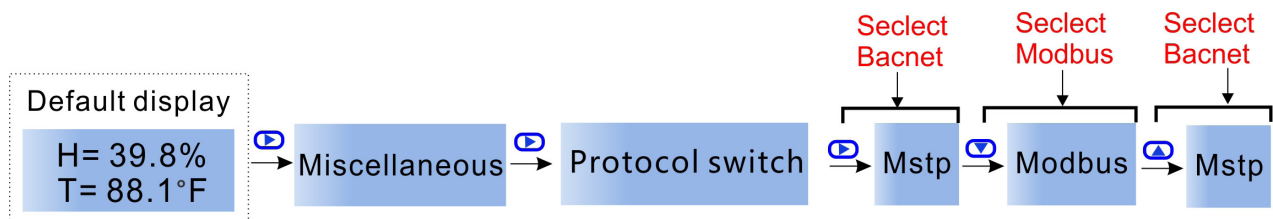
and

Prs_def
NO

- h. Back to factory default: select “YES” will make all the parameters of unit back to factory value.

Modbus/Bacnet switch

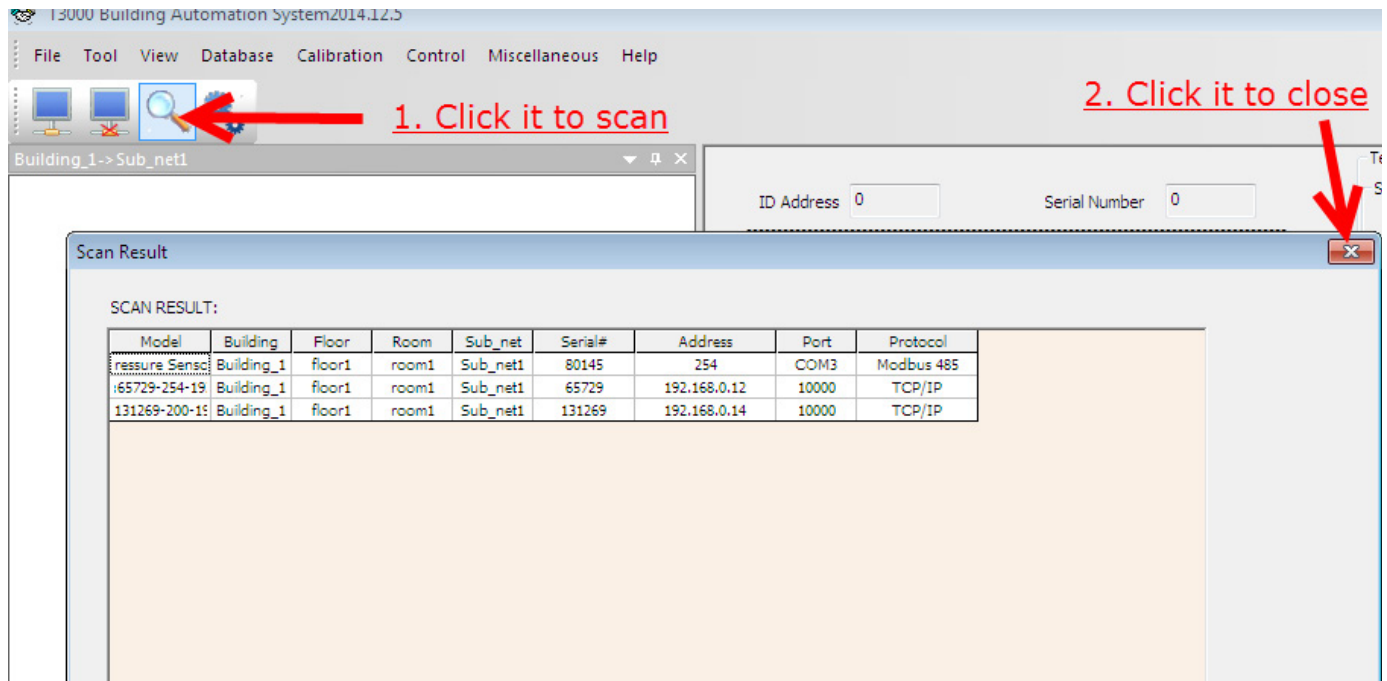
To select the protocol as Modbus or Bacnet, Press  to choose Miscellaneous, then press  to choose Protocol switch, press , it reads Mstp, which means you have selected Bacnet ;if you want to switch to Modbus, press , or  back to Bacnet.



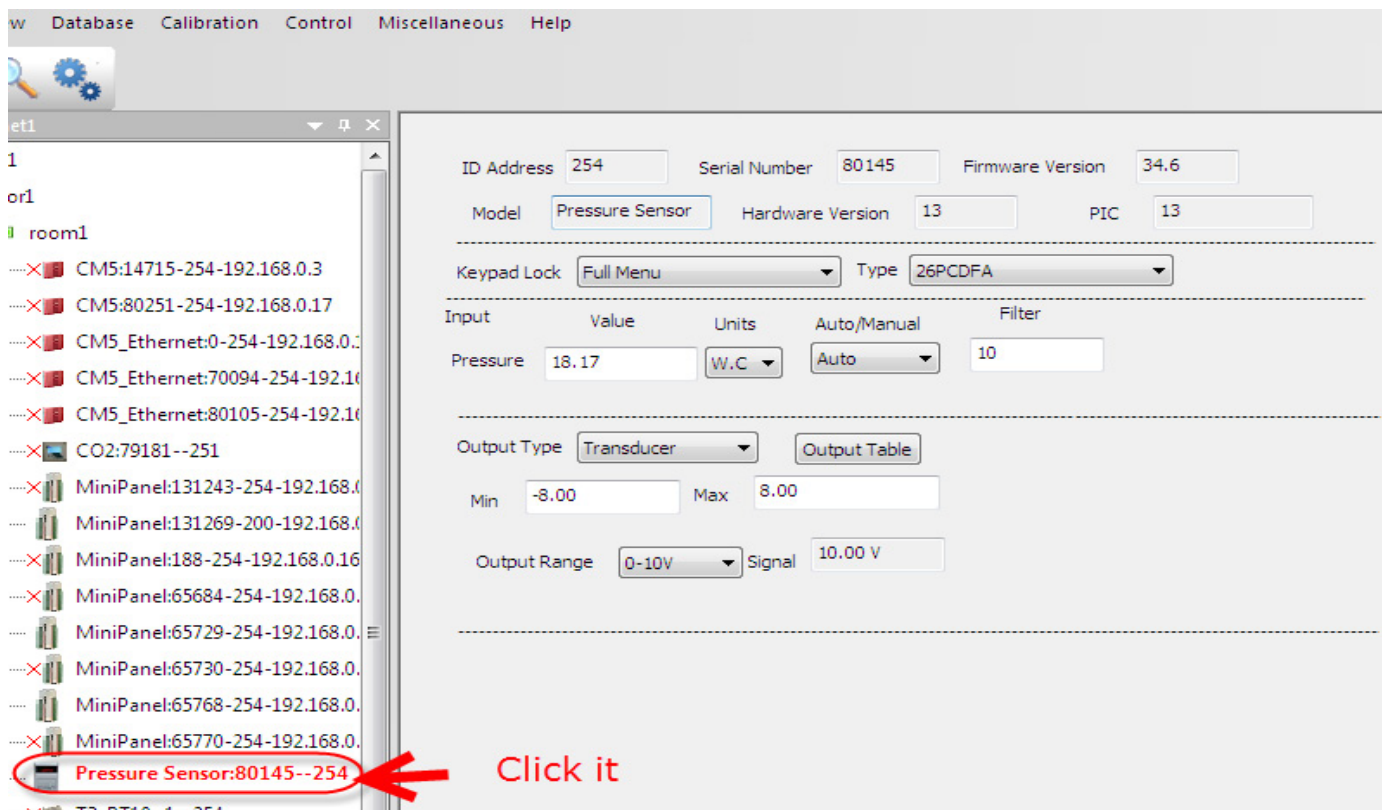
Or you can check the Bacnet Register List, No.9: Protocol switch. 0 = MODBUS, 1=MSTP.

Calibrations

- 1). Connect pressure sensor to PC by RS485.
- 2). Open T3000 and click the button to scan. The following view will appear then close it as the picture shows.



- 3). Click pressure sensor log and the T3000 will show all the information of pressure sensor.



4). Make sure your sets are same to the below.

The screenshot shows the configuration interface for a pressure sensor. It includes fields for ID Address (254), Serial Number (80145), Firmware Version (34.6), Model (Pressure Sensor), Hardware Version (13), and PIC (13). The Keypad Lock is set to Full Menu and the Type is 26PCDFA. The Input section shows a Pressure value of 18.65, Units of W.C, Auto/Manual set to Auto, and a Filter of 10. The Output Type is Transducer, with Min set to -8.00 and Max set to 8.00. The Output Range is 0-10V and the Signal is 10.00 V. A Pressure Calibration Table is shown on the right.

Pressure Calibration Table

	Pressure	AD
1	0	4
2	295	77
3	677	193
4	-1	-1
5	-1	-1
6	-1	-1
7	-1	-1
8	-1	-1
9	-1	-1
10	-1	-1

Annotations:

- Red arrow pointing to the Type dropdown: "This is your product"
- Red arrow pointing to the Output Type dropdown: "Set transducer mode and AO will be work"

The screenshot shows the configuration interface for a pressure sensor. It includes fields for ID Address (254), Serial Number (80145), Firmware Version (34.6), Model (Pressure Sensor), Hardware Version (13), and PIC (13). The Keypad Lock is set to Full Menu and the Type is 26PCDFA. The Input section shows a Pressure value of 19.33, Units of W.C, Auto/Manual set to Auto, and a Filter of 10. The Output Type is Transducer, with Min set to -8.00 and Max set to 8.00. The Output Range is 0-5V and the Signal is 5.00 V. A Pressure Calibration Table is shown on the right.

Pressure Calibration Table

	Pressure	AD
1	0	4
2	295	77
3	677	193
4	-1	-1
5	-1	-1
6	-1	-1
7	-1	-1
8	-1	-1
9	-1	-1
10	-1	-1

Annotations:

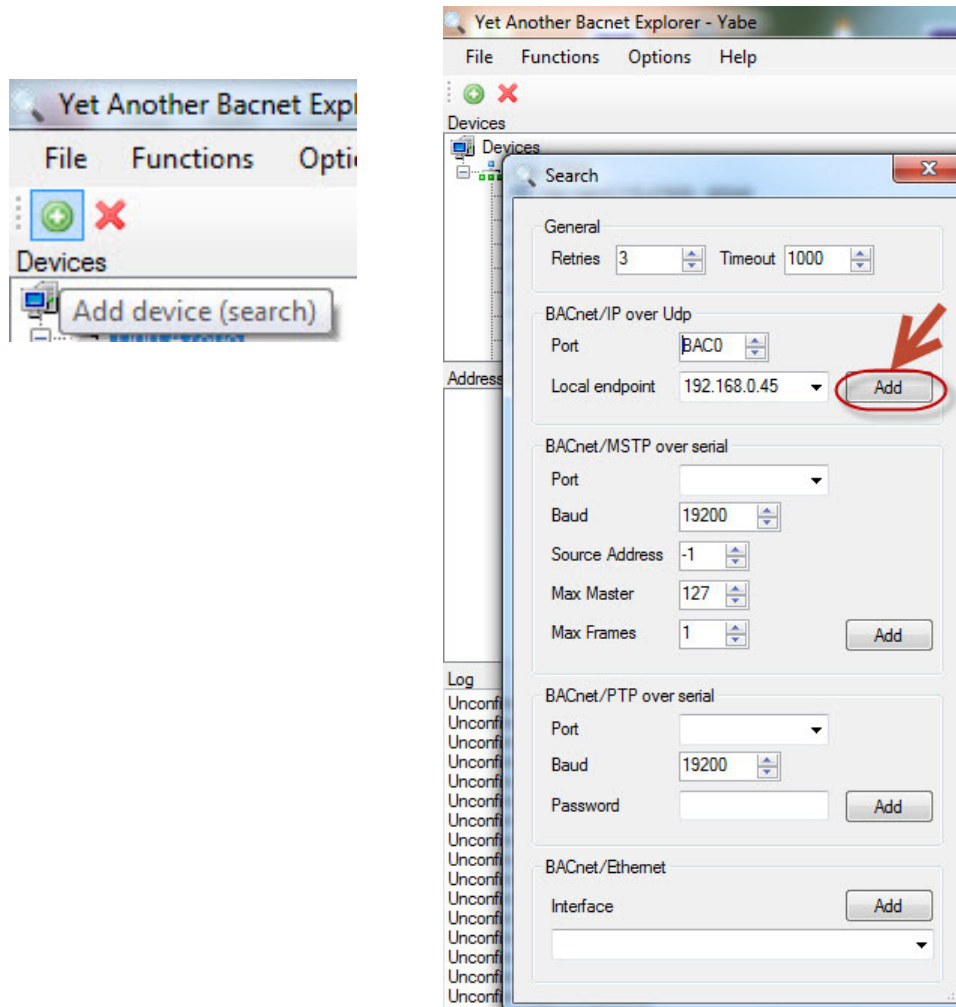
- Red arrow pointing to the Pressure value: "Pressure Value"
- Red arrow pointing to the Output Range dropdown: "Range Set"
- Red arrow pointing to the Signal value: "Analog Output Value"

Connecting to the device using Bacnet

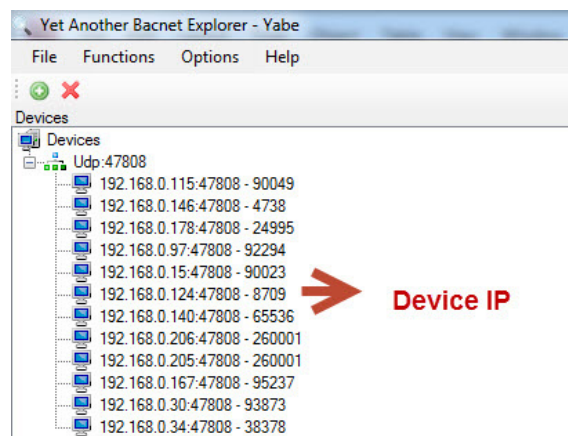
The device can be connected using Bacnet. Below are the steps:

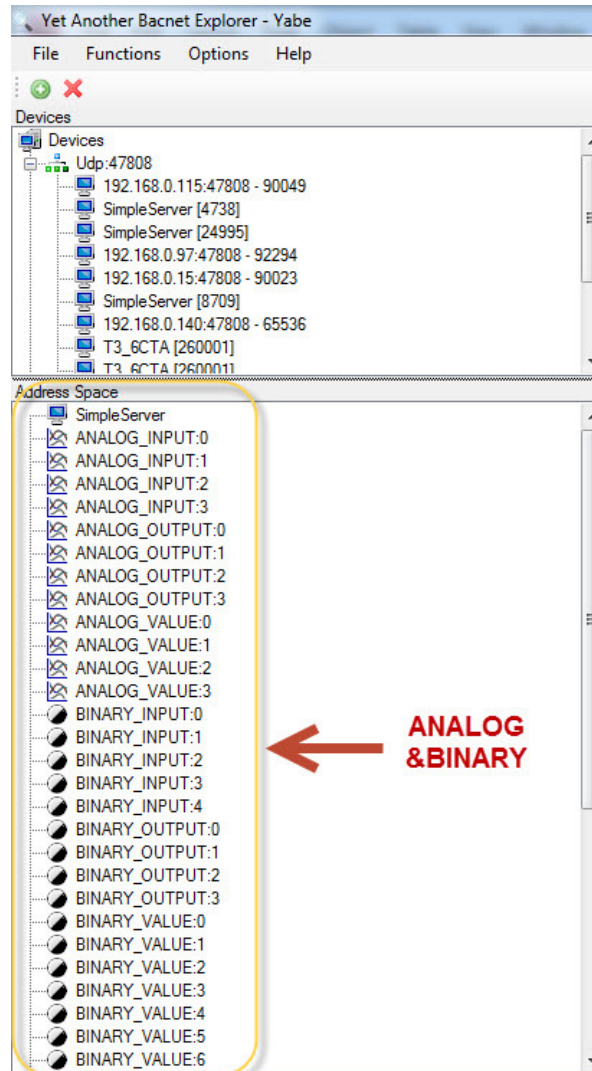
Step 1. Download Yabe software as the link: <https://www.temcocontrols.com/ftp/software/08Yabe.zip> and install it.

Step 2. Connect the device to the computer, select Bacnet protocol. Start the Yabe software, add the

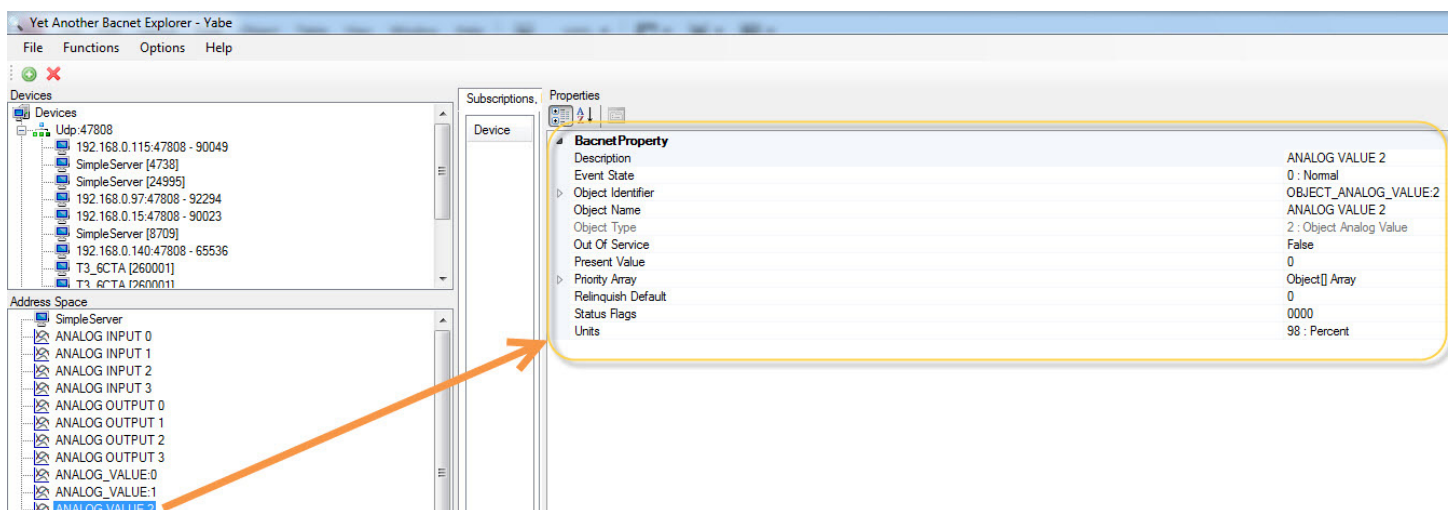


Step 3. You can find your device IP as below. Double click the left mouse button, you can find your device and the bacnet information in the "Address Space" tab.





Step4. In the "Address Space" tab, click the "ANALOG_VALUE", it will show the information of "log ANALOG_VALUE" in the BacnetProperty tab. And it's the same with "ANALOG_OUTPUT" and other items.



Register List

Address	Bytes	Register and Description
0 to 3	4	Serial Number - 4 byte value. Read-only
4 to 5	2	Software Version – 2 byte value. Read-only
6	1	ADDRESS. Modbus device address
7	1	Product Model. This is a read-only register that is used by the microcontroller to determine the product
8	1	"Hardware Revision. This is a read-only register that is used by the microcontroller to determine the hardware rev"
9	1	PIC firmware version
10	1	"PLUG_N_PLAY_ADDRESS, 'plug n play' address, used by the network master to resolve address conflicts. See VC code for algorithms"
15	1	Base address selection.0 = Protocol address,1 = PLC address.
16	1	Firmware Update Register, used to show the status of firmware updates
11 to 100		Blank, for future use
101	2	Pressure value and calibrate.
102	2	COOLING_VALVE, a number from 0-1000 representing 0% (closed) to 100% (open)
103	2	HEATING_VALVE, a number from 0-1000 representing 0% (closed) to 100% (open)
104	2	PID, current PI calculation for cooling term
105		NOT USED FOR REV 25
106	1	COOL_HEAT_MODE, heating or cooling mode. 0=none, 1=cooling, 2=heating.
107	1	MODE_OPERATION, heating or cooling state: 0-7 = coasting, cooling 1,2,3, heating 1,2,3
108	1	DIGITAL_OUTPUT_STATE, bit 0 thru 4 = relay 1 thru 5.
112	1	DAC_OFFSET , Calibration data for the 0-10VDC signal, internal variable maintained by tstat(default 100)
113	1	NOT USED FOR REV 25
114	1	PTERM , proportional term for PI calculation
115	1	ITERM , integral term for PI calculation
118	1	SEQUENCE , control sequence i.e. fancoil, heatpump etc. (default 1)
119	1	COOLING_DEADBAND , offset from setpoint for cooling to begin. Units of 0.1 deg.
120	1	HEATING_DEADBAND , offset from setpoint for heating to begin. Units of 0.1 deg.
122	1	FAN , number of fan speeds. Single speed = 1 up to three speed fan = 3
123	1	NIGHT_HEATING_DEADBAND , heating deadband in the night time or OFF mode. Units of 1 deg.
124	1	NIGHT_COOLING_DEADBAND , cooling deadband for the night (OFF) mode. Units of 1 deg.
125	1	APPLICATION , application: 0 = office, 1 = Hotel or Residential(default 1)
126	1	POWERUP_SETPOINT , setpoint on power up
127	1	"POWERUP_MODE, mode of operation on power up. 0 = power off, 1 = power up in on mode, 2 = last value (default), 3 = auto mode."
129	1	"AUTO_ONLY , enables or disables manual mode. 0 = Manual Fan Modes 1-x Allowed (depending on R122 value, 1 = Auto Mode Only, 2 = DDC mode,the user can not change setpoint and fan speed from keypad."
131	1	MAX_SETPOINT, Setpoint high, the highest setpoint a user will be able to set from the keypad.

Address	Bytes	Register and Description
132	1	MIN_SETPOINT, Setpoint Low, the lowest setpoint a user will be able to set from the keypad.
133	1	"SPECIAL_MENU_LOCK, Special menu lockout via keypad, serial port only, 0=Full Menu, 1=Menu Disabled, 2=User Menu, 3 = The user need adjust setpoint in menu mode,4=disable display"
135	1	current setpoint
137	1	FAN_SPEED, current operating fan speed
		Relay Output Tables (bit0 = relay1, bit1 = relay2, bit2 = relay3, bit3 = relay4, bit4 = relay5) "Fan0 table is for the off state. Fan1, Fan2, and Fan3 are for the manual states. Fan4 is for the Auto state. These states are controlled by the user." The mode of operation (coasting, cooling, heating) is determined by the PID parameter.
138	1	FAN0_OPERATION_TABLE_COAST
139	1	FAN0_OPERATION_TABLE_COOL1
140	1	FAN0_OPERATION_TABLE_COOL2
141	1	FAN0_OPERATION_TABLE_COOL3
142	1	FAN0_OPERATION_TABLE_HEAT1
143	1	FAN0_OPERATION_TABLE_HEAT2
144	1	FAN0_OPERATION_TABLE_HEAT3
145	1	FAN1_OPERATION_TABLE_COAST
146	1	FAN1_OPERATION_TABLE_COOL1
147	1	FAN1_OPERATION_TABLE_COOL2
148	1	FAN1_OPERATION_TABLE_COOL3
149	1	FAN1_OPERATION_TABLE_HEAT1
150	1	FAN1_OPERATION_TABLE_HEAT2
151	1	FAN1_OPERATION_TABLE_HEAT3
152	1	FAN2_OPERATION_TABLE_COAST
153	1	FAN2_OPERATION_TABLE_COOL1
154	1	FAN2_OPERATION_TABLE_COOL2
155	1	FAN2_OPERATION_TABLE_COOL3
156	1	FAN2_OPERATION_TABLE_HEAT1
157	1	FAN2_OPERATION_TABLE_HEAT2
158	1	FAN2_OPERATION_TABLE_HEAT3
159	1	FAN3_OPERATION_TABLE_COAST
160	1	FAN3_OPERATION_TABLE_COOL1
161	1	FAN3_OPERATION_TABLE_COOL2
162	1	FAN3_OPERATION_TABLE_COOL3
163	1	FAN3_OPERATION_TABLE_HEAT1
164	1	FAN3_OPERATION_TABLE_HEAT2
165	1	FAN3_OPERATION_TABLE_HEAT3

Pressure Sensor

Address	Bytes	Register and Description
166	1	FANAUT_OPERATION_TABLE_COAST
167	1	FANAUT_OPERATION_TABLE_COOL1
168	1	FANAUT_OPERATION_TABLE_COOL2
169	1	FANAUT_OPERATION_TABLE_COOL3
170	1	FANAUT_OPERATION_TABLE_HEAT1
171	1	FANAUT_OPERATION_TABLE_HEAT2
172	1	FANAUT_OPERATION_TABLE_HEAT3
173	1	VALVE_OPER_TABLE_COAST, Analog output state for each of the 7 modes of operation
174	1	VALVE_OPER_TABLE_COOLING1
175	1	VALVE_OPER_TABLE_COOLING2
176	1	VALVE_OPER_TABLE_COOLING3
177	1	VALVE_OPER_TABLE_HEATING1
178	1	VALVE_OPER_TABLE_HEATING2
179	1	VALVE_OPER_TABLE_HEATING3
182	1	Night heating setpoint
183	1	Night cooling setpoint
184	1	Info Byte, this register contains info about the state of the tstat.
		"Bit 0 is read/write and shows the occupancy mode. Bit 0 = 0 means unoccupied. Bit 0 = 1 means occupied. "
		"Bit 1 is read only and shows the reset state. Bit 1 = 0 means hardware restart. Bit 1 = 1 means software restart. "
		"Bit 2 is read/write and is the reset prevention bit. Bit 2 = 0 means the tstat will automatically reset after certain registers are changed. Bit 2 = 1 prevents this reset. Changing this bit from 1 to 0 will trigger a reset."
		Bit 3 is the state of the digital input. Bit 3 = 1 means logic high. Bit 3 = 0 means logic low.
		Bit 4,5: Reserved, used for some non standard occupancy sensor logic
		Bit6 0=no delay on modbus reply, 1= 10ms delay before send for slower PLC's to switch from TX to RX
		"Bit7, RS485/wireless communications mode: The normal communications method is a bus topology using RS485 which uses a 'transmit enable' or TX_EN line on the RS485 hardware whenever transmission from the thermostat to the bus takes place. For wireless devices this is typically taken care of by the radio module itself so it is not needed. Default = 0, When bit7 is 0, the RS485 chip, TX_EN line is used for normal RS485 bus communications. When bit7 is 1, the TX_EN line is not used, allowing the radio module to communicate one-to-one with the Tstat"
185	1	Bau - Baudrate, 0=9.6kbaud, 1=19.2kbaud, 2=38.4kbaud 3=57.6kbaud, 4=115.2kbaud
186	1	Ou1 - Output1 Scale - 1=0-10V, 2=0-5V, 5= 4-20mA(for pressure)
213	1	Pressure sensor filter, FIL.
214		Heating cooling mode configuration, HC, 0=PID, 1=Keypad, 2=Digital_in1, 3=Digital_in1, 4=Analog_in1, 5=Analog_in2
215		Internal Temperature Sensor IC - Shows the filtered, calibrated value of the internal temperature sensor IC
216		Internal Thermistor Sensor - Shows the filtered, calibrated value of the internal thermistor sensor

Pressure Sensor

Address	Bytes	Register and Description
217	2	Calibration Internal Thermistor - Calibration value used on the internal thermistor
218	2	Calibration Analog Input2 - Calibration value used on the analog input 2
219	2	Lookup Table 1 - 0.0V value Sensor value that corresponds to 0.0V
220	2	Lookup Table 1 - 0.5V value Sensor value that corresponds to 0.5V
221	2	Lookup Table 1 - 1.0V value Sensor value that corresponds to 1.0V
222	2	Lookup Table 1 - 1.5V value Sensor value that corresponds to 1.5V
223	2	Lookup Table 1 - 2.0V value Sensor value that corresponds to 2.0V
224	2	Lookup Table 1 - 2.5V value Sensor value that corresponds to 2.5V
225	2	Lookup Table 1 - 3.0V value Sensor value that corresponds to 3.0V
226	2	Lookup Table 1 - 3.5V value Sensor value that corresponds to 3.5V
227	2	Lookup Table 1 - 4.0V value Sensor value that corresponds to 4.0V
228	2	Lookup Table 1 - 4.5V value Sensor value that corresponds to 4.5V
229	2	Lookup Table 1 - 5.0V value Sensor value that corresponds to 5.0V
230	2	Lookup Table 2 - 0.0V value Sensor value that corresponds to 0.0V
231	2	Lookup Table 2 - 0.5V value Sensor value that corresponds to 0.5V
232	2	Lookup Table 2 - 1.0V value Sensor value that corresponds to 1.0V
233	2	Lookup Table 2 - 1.5V value Sensor value that corresponds to 1.5V
234	2	Lookup Table 2 - 2.0V value Sensor value that corresponds to 2.0V
235	2	Lookup Table 2 - 2.5V value Sensor value that corresponds to 2.5V
236	2	Lookup Table 2 - 3.0V value Sensor value that corresponds to 3.0V
237	2	Lookup Table 2 - 3.5V value Sensor value that corresponds to 3.5V
238	2	Lookup Table 2 - 4.0V value Sensor value that corresponds to 4.0V
239	2	Lookup Table 2 - 4.5V value Sensor value that corresponds to 4.5V
240	2	Lookup Table 2 - 5.0V value Sensor value that corresponds to 5.0V

Pressure Sensor

Address	Bytes	Register and Description
241	2	Universal PID input select, 0=none, 1=analog_in1, 2=analog_in2
242	2	Universal PID upper deadband
243	2	Universal PID lower deadband
244	2	Universal PID pterm
245	2	Universal PID iterm
246	2	Universal PID setpoint
252	1	Output 6 PID Control
254	1	Universal PID Output - Coasting
255	1	Universal PID Output - Cooling1
256	1	Universal PID Output - Cooling2
257	1	Universal PID Output - Cooling3
258	1	Universal PID Output - Heating1
259	1	Universal PID Output - Heating2
260	1	Universal PID Output - Heating3
		Analog Output Tables (bit0,1=analog out1, bit2,3=analog out2, 00=0%, 01=0-100%, 11=100%)
261	1	Universal PID Valve Output - Coasting
262	1	Universal PID Valve Output - Cooling1
263	1	Universal PID Valve Output - Cooling2
264	1	Universal PID Valve Output - Cooling3
265	1	Universal PID Valve Output - Heating1
266	1	Universal PID Valve Output - Heating2
267	1	Universal PID Valve Output - Heating3
268	1	Number of Heating Stages in Universal Table-(Maximum # of total heating and cooling states is 6)
269	1	Number of Cooling Stages in Universal Table-(Maximum # of total heating and cooling states is 6)
270	1	Universal PID
275	2	Universal Night Setpoint
276	1	Number of Heating Stages in Original Table - (Maximum # of total heating and cooling states is 6)
277	1	Number of Cooling Stages in Original Table - (Maximum # of total heating and cooling states is 6)
278	1	PID2 heating or cooling state.0=coasting, 1=cooling1, 2=cooling2, 3=cooling3, 4=heating1, 5=heating2, 6=heating3, 14=cooling4, 15=cooling5, 16=cooling6, 17=heating4, 18=heating5, 19=heating6.
279	1	Valve travel time. The time of the valve travel from one end to another end. The units is second.
285	1	Valve percent. Show the valve opened how much percent. READ ONLY
309	1	Input auto/ manual enable
310	1	"Output auto/manual enable. Bit 0 to 4 correspond to output1 to output5, bit 5 correspond to output6(register 102), bit 6 correspond to output7(register 103). 0, auto mode; 1, manual mode."

Pressure Sensor

Address	Bytes	Register and Description
311	1	Digital manual input. Write the manual value for digital input when digital input in manual mode.
319	1	The minimum device address can be set
320	1	The maximum device address can be set. The device address should be between min and max address
326	1	Show the size of E2 chip. 0 = 24c02, 1 = 24c08/24c16.
338	1	Default occupied setpoint. Works in concert with the "occupied setpoint control register", register 339
		Analog Output Tables (bit0,1 =analog out1, bit2,3=analog out2, 00=0%, 01=0-100%, 11=100%)
351	1	Analog output OFF table, coasting mode
352	1	Analog output OFF table, cooling1 mode
353	1	Analog output OFF table, cooling2 mode
354	1	Analog output OFF table, cooling3 mode
355	1	Analog output OFF table, heating1 mode
356	1	Analog output OFF table, heating2 mode
357	1	Analog output OFF table, heating3 mode
407	1	the pressure sensor analog value
408	1	the raw data of pressure
411	1	pressure sensor type.1=MPXV7002,2=26PCDFA
412	1	Pressure unit select. 1:W.C 2:KPa 3:Psi 4:mmHg 5:inches of Hg 6:Kg/cm2 7:atmosphere 8:bar
413	1	minimal pressure(0 to -1000), for example if current pressure unit is inch of water, -800 = -8inch if water
414	2	maximum pressure(0 to +1000) for example if current pressure unit is inch of water, +800 = 8inch if water
419		Pressure analog output select 0: output control by PID, for example if PID is 0 to 1000, output will be 0 to 10V 1:transduce mode, output voltage = (current pressure/(max pressure - min pressure)) x 10V
422	1	clear the pressure's offset
423	1	0-10V output calibration parameter,typical 15
424	1	4-20mA output calibration difference,typical 95
425	1	4-20mA output calibration offset,typical 8
426	2	1st calibration pressure value
427	2	1st calibration voltage value
428	2	2nd calibration pressure value
429	2	2nd calibration voltage value
430	2	3rd calibration pressure value
431	2	3rd calibration voltage value
432-445	12	4th-10th calibration value
446-455	40	0-10V output output calibration value
456-465	40	4-20mA output output calibration value