

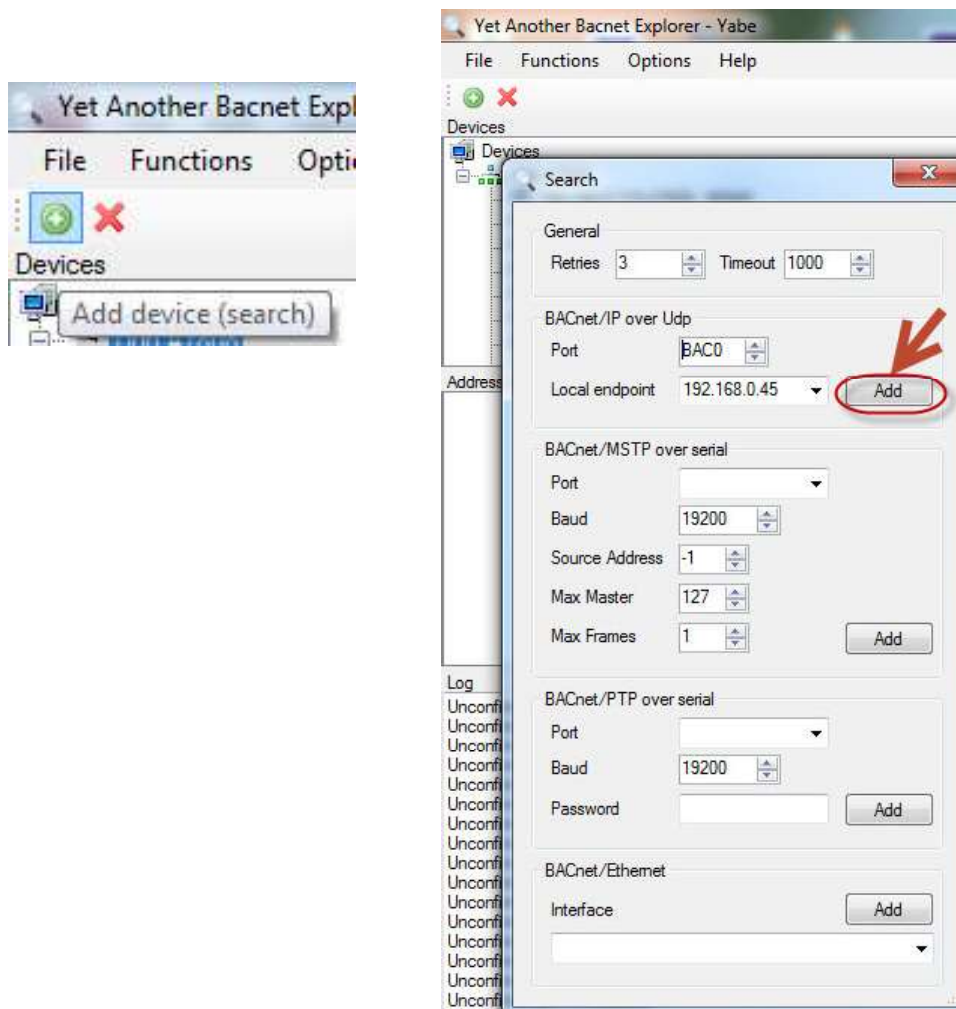
# CO2-Humidity-Temp Transmitter w/ Bacnet

## Connecting to the device using Bacnet

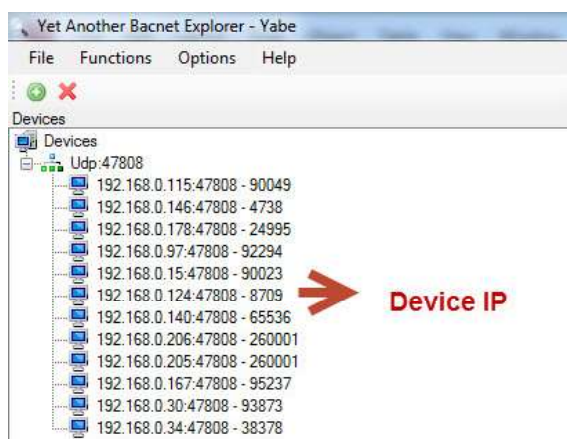
The device can be connected using Bacnet. Below are the steps:

Step 1. Download Yabe software as the link: <https://tinyurl.com/ycrt9jep> and install it.

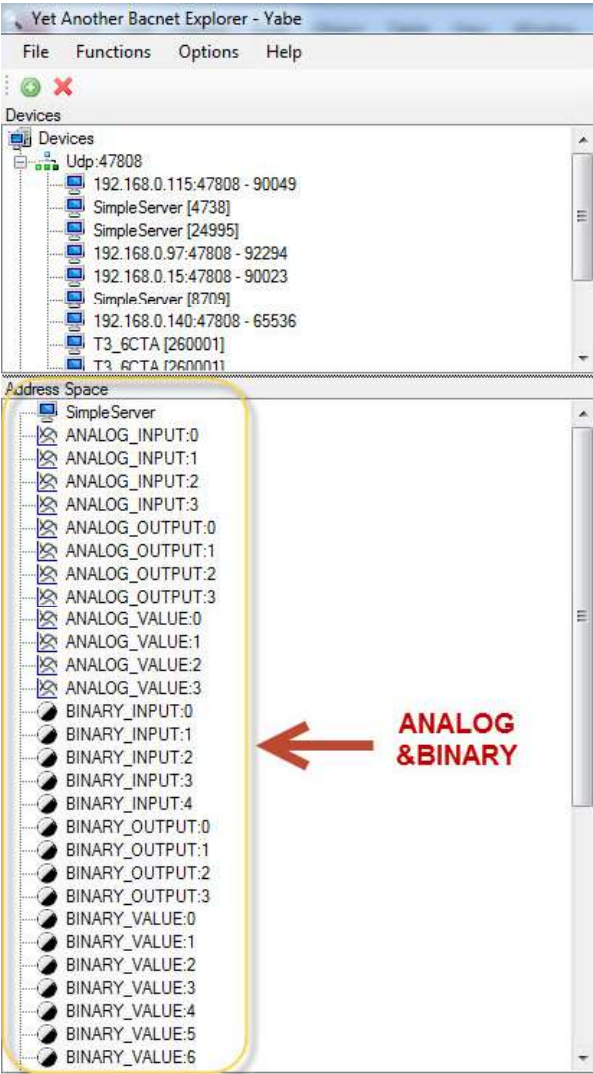
Step 2. Connect the device to the computer, select Bacnet protocol. Start the Yabe software, add the device.



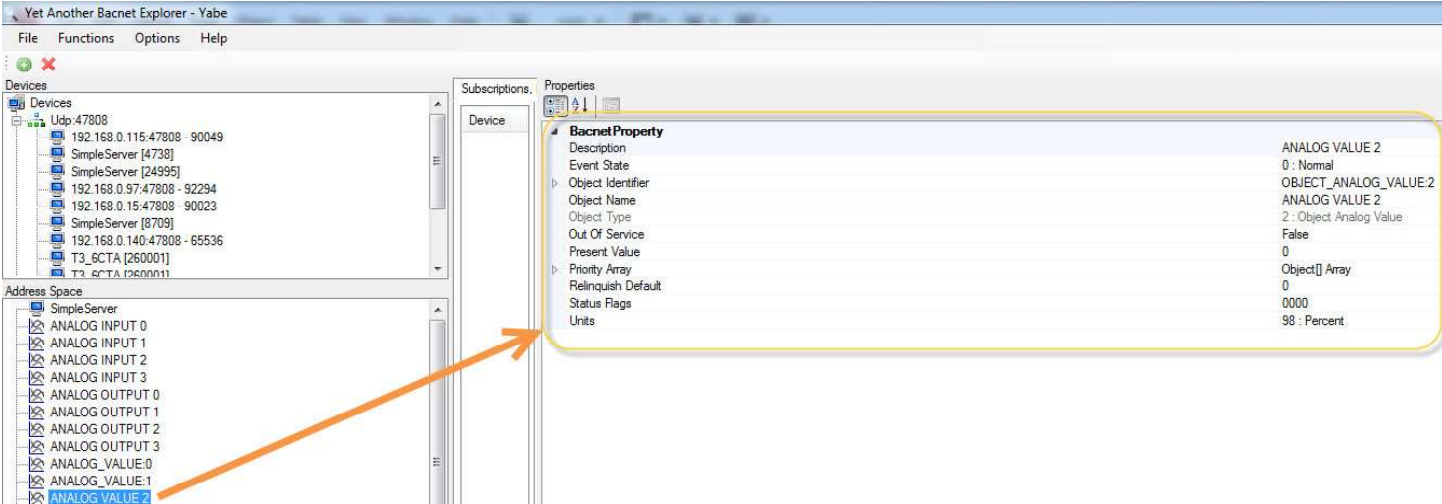
Step 3. You can find your device IP as below. Double click the left mouse button, you can find your device and the bacnet information in the "Address Space" tab.



# CO2-Humidity-Temp Transmitter w/ Bacnet



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.



## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D&CO2-W Without Ethernet Register Description
0..1	2	Lower 2 bytes of the serial number
2..3	2	Upper 2 bytes of the serial number
4	1	firmware version lower byte. eg. FW version = 10.12, so lower byte = 12 AND high byte = 10. Fixed.
5	1	firmware version upper byte. eg. FW version = 10.12, so lower byte = 12 AND high byte = 10. Fixed.
6	1	Default Modbus device address=254
7	1	Product ID, Fixed.
8	1	Hardware version
9	1	spare
10	1	spare
11	1	Time zone
12	1	Baudrate Setting: 0 = 9600bps, 1 = 19200bps,2=38400bps,3=57600bps,4=115200bps
13	1	day lighting switch, 0 =disable day lighting feature, 1= enable
14	1	spare
15	1	reset flash. The unit will clear all configs to zero if this register being set to 0x55 = 85
16	1	Firmware Update Register, used to show the status of firmware updates
17 to 20	4	spare
21	1	Protocol switch. 3 = MODBUS,0=MSTP.
22~39	18	spare
40 to 45	6	reg40, MAC address, read only normally. (they can be written if write the regisiter 93 to 1 first, for the default setting before out of the factory.)
46	1	reg46, IP mode. 0=static IP; 1= DHCP
47 to 48	2	reg47, upper two bytes of IP address
49 to 50	2	reg49, lower two bytes of IP address
51 to 52	2	reg51, right two bytes of SUBNET MASK address
53 to 54	2	reg53, left two bytes of SUBNET MASK address
55 to 56	2	reg55, right two bytes of GATEWAY address
57 to 58	2	reg57, left two bytes of GATEWAY address
59	1	reg59, 0, TCP server, (NO USE)
60	1	reg60, listen port at TCP server mode
61 to 75		buffer mirror for changing to a new IP address, copy of reg 46 to 60
76	1	write 1 to set the ghost settings to the system and start new settings, then clear the ghost registers.
91	1	Set 1 manual to write configurations to flash
92	1	Period of write configurations to flash if configurations changed without setting register to 1. counter by second.
93	1	Enable for MAC setting. It should be set as 1 before write the new MAC to the MAC registers(100-105), and it will be cleared automatically after setting the MAC address.
94 to 99	7	Reserved for future.
100 to 105	6	reg100, MAC address, read only normally. (they can be written if write the regisiter 93 to 1 first, for the default setting before out of the factory.)
106	1	reg106, IP mode. 0=static IP; 1= DHCP

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D&CO2-W Without Ethernet Register Description
111 to 112	2	reg111, right two bytes of SUBNET MASK address
113 to 114	2	reg113, left two bytes of SUBNET MASK address
115 to 116	2	reg115, right two bytes of GATEWAY address
117 to 118	2	reg117, left two bytes of GATEWAY address
119	1	reg119, 0, TCP server, (NO USE)
120	1	reg120, listen port at TCP server mode
121 to 135	1	buffer mirror for changing to a new IP address, copy of reg 106 to 120
136	1	write 1 to set the ghost settings to the system and start new settings, then clear the ghost registers.
137 to 171	40	Reserved
172	1	scan command< =6 start scan>/LHN add
173	1	subnet <add =1rs485 =2zigbee =4all> /LHN add
174	1	NTP command< =6,start ntp >/LHN add
175 to 178	4	Time Server0 ipaddress
179 to 182	4	Time Server1 ipaddress
183 to 186	4	Time Server2 ipaddress
187 to 190	4	Time Server3 ipaddress
191 to 194	4	Time Server4 ipaddress
195 to 198	4	Time Server5 ipaddress
199	1	Time Sync result: 0-Fail 1-Successful
200	1	Temperature sensor selection, 0=external, 1=internal. Read only, it will be set to 1 if the humidity module exists.
201	1	Select the unit of temperature to display on LCD. 0=degree Celsius, 1=degree Fahrenheit
202	2	The value of on board temperature sensor, the unit is degree Celsius. The resolution is 0.1 degree.
203	2	The value of on board temperature sensor, the unit is degree Fahrenheit. The resolution is 0.1 degree.
204	2	The value of external temperature sensor, the unit is degree Celsius. The resolution is 0.1 degree.
205	2	The value of external temperature sensor, the unit is degree Fahrenheit. The resolution is 0.1 degree.
206	2	The temperature offset for calibrating the internal temperature. The resolution is 0.1 degree.
207	2	Relative humidity. The resolution is 0.1%
208	2	Read only. The real frequency read from the humidity module, unuse.
209	1	Read only. The number of the calibration table points.
210	1	Internal CO2 sensor selection. The value is 1 as default.
211	2	The co2 ppm value of internal co2 sensor.
212	2	The co2 ppm offset for calibrating internal co2 sensor.
213	2	The setpoint value of fair alarm for internal co2 sensor.
214	2	The setpoint value of poor alarm for internal co2 sensor.
215 to 468	2*254	The co2 ppm value of the external co2 sensors if there are/is co2 nodes connect to it.
469 to 722	2*254	The co2 ppm offset for calibrating external co2 sensors.
723 to 976	2*254	The setpoint value of fair alarm for external co2 sensors.

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D-E&CO2-W-E With Ethernet Register Description
200 to 239	2*40	The continuous_alarm ppm setpoint of external co2 sensor. Support 50 external nodes.
240 to 279	2*40	The ppm offset for calibrating the external co2 sensor ppm. Support 50 external nodes.
280	1	"Analog output auto or manual. Bit0 for temperature, 0 = auto, means the output value according to the temperature read from sensor; 1 = manual, means the output value according to the value set in output_manual_value_temp (register 321). Bit1 for humidity, 0 = auto, means the output value according to the humidity read from sensor; 1 = manual, means the output value according to the value set in output_manual_value_humidity (register 322). Bit2 for co2, 0 = auto, means the output value according to the co2 read from sensor; 1 = manual, means the output value according to the value set in output_manual_value_co2 (register 323)."
281	2	output_manual_value_temp
282	2	output_manual_value_humidity
283	2	output_manual_value_co2
284	1	the output mode, (0-5V,0-10V,4-20mA)
285	2	the minimum degree of temperature range corresponding to the temperature output(0-5V,0-10V,4-20mA)
286	2	the maximum degree of temperature range corresponding to the temperature output(0-5V,0-10V,4-20mA)
287	2	the minimum percent of humidity range corresponding to the humidity output(0-5V,0-10V,4-20mA)
288	2	the maximum percent of humidity range corresponding to the humidity output(0-5V,0-10V,4-20mA)
289	2	the minimum ppm of co2 range corresponding to the co2 output(0-5V,0-10V,4-20mA)
290	2	the maximum ppm of co2 range corresponding to the co2 output(0-5V,0-10V,4-20mA)
291	1	INFO_BYTE, TBD.
292	1	RS485 Baudrate, 0 = 9600, 1 = 19200
293	1	RTC second, from 0 to 59.
294	1	RTC minute, from 0 to 59.
295	1	RTC hour, from 0 to 23.
296	1	RTC day, from 1 to 31.
297	1	RTC week, from 0 to 6, 0 = Sunday.
298	1	RTC month, from 1 to 12.
299	2	RTC year, from 0 to 99 (2000 to 2099).
300	1	The password to log in the menu system. 1=Enable. 0=Disable.
301	1	The first password character, from '0' to '9'.
302	1	The second password character, from '0' to '9'.
303	1	The third password character, from '0' to '9'.
304	1	The fourth password character, from '0' to '9'.
305	2	Menu block time. The menu will back to idle state after this seconds.
306	2	Backlight keep time. The backlight will turn off after this seconds
307	1	External node plus&play. 1=Enable, 0=Disable.
308	1	Device number in the scan database, include the master unit itself.
309	1	Set 1 to clear the scan database
310 to 314	5	First device of the database, the display unit take it.
		5 bytes: 1st = address, 2nd..5th = serial number

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D-E&CO2-W-E With Ethernet Register Description
315 to 319	5	Second device of the database, the first external sensor.
		5 bytes: 1st = address, 2nd..5th = serial number
		If the address is 0 or 255, that means not device behind.
320 to 324	5	...
...	5	...
...	5	...
510	5	The end of the database

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D-E&CO2-W-E With Ethernet Register Description
977 to 1230	2*254	The setpoint value of poor alarm for external co2 sensors.
1231	2	The value to eliminate the pulse of the co2 ppm.
1232	1	The filter to make the ppm value smoothly, it is 5 as default.
1233	1	Enable/Disable the password for the menu system operation. 0=Disable, 1=Enable.
1234	1	The first digital of the password. Should be from 0 to 9.
1235	1	The second digital of the password. Should be from 0 to 9.
1236	1	The third digital of the password. Should be from 0 to 9.
1237	1	The fourth digital of the password. Should be from 0 to 9.
1238	1	The century of the real time clock.
1239	1	The year of the real time clock.
1240	1	The month of the real time clock.
1241	1	The date of the real time clock.
1242	1	The weekday of the real time clock.
1243	1	The hour of the real time clock.
1244	1	The minute of the real time clock.
1245	1	The second of the real time clock.
1246	1	Alarm auto/manual control. Bit7: 0 = auto, 1 = manual; bit0:1 = pre_alarm; bit1: 1 = continuous_alarm; bit(1:0): 00 = stop_alarm
1247	1	The alarm output turn on time, <= 20 seconds.
1248	1	The alarm output turn off time, <= 20 seconds.
1249	1	Alarm output delay time. It delays the alarm output when the alarm is triggered. It is 5 seconds as default.
1250	1	Analog output auto/manual control. Bit 0 directs to temperature output, Bit 1 directs to humidity output, Bit 2 directs to co2 output. 0=Auto, 1=Manual.
1251	2	The manual value of temperature.
1252	2	The manual value of humidity.
1253	2	The manual value of co2.
1254	1	Analog output mode, read only, select by jumper. 1=4-20mA, 2=0-5V, 3=0-10V
1255	2	The minimum value of temperature for analog output.
1256	2	The maximum value of temperature for analog output.
1257	2	The minimum value of humidity for analog output.
1258	2	The maximum value of humidity for analog output.
1259	2	The minimum value of co2 for analog output.
1260	2	The maximum value of co2 for analog output.
1261	1	The period for the menu system to stay at the submenu. It goes to the main menu when it expires in the submenu.
1262	1	The period for the LCD backlight keep on. The backlight turns on when key is triggered, and turns off when it expires.
1263	1	Enable/Disable the plug-and-play feature of the external nodes. 0=disable, 1=enable.
1264	1	The number of co2 sensors connect to the unit, includes the internal co2 sensor.
1265	1	Set 1 to reset the scan table.

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-D-E&CO2-W-E With Ethernet Register Description
1266 to 1270	1*5	The first co2 node information. Normally it is the unit itself.
		register1266: the modbus ID of the co2 sensor.
		register1267..1270: the serial number of the co2 sensor.
1271 to 1275	1*5	The secod co2 node information. Normally, it is the first external co2 node.
1276 to 1280	1*5	The third co2 node information.
...		
...		



## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-Node Modbus Register 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
17 to 99		Blank, for future use
100	2	adc value of co2 voltage output, not used, read only
101	2	adc value of temperature voltage output, not used, read only
102	2	adc value of humidity voltage output, not used, read only
103	2	adc value of co2 current output, not used, read only
104	2	adc value of temperature current output, not used, read only
105	1	adc value of humidity current output, not used, read only
106	2	adc value of on board thermistor sensor, read only
107	2	adc value of on board light sensor, read only
108	2	co2 value (ppm). It will be calibrated if write to it.
109	2	co2 calibration offset. User can change it to calibrate the co2 ppm. It will be changed also if user write the data to register co2 ppm
110	1	Delta value for eliminating the pulse ppm value. The default value is 200.
111	2	Filter times, make the ppm value go smooth. The default value is 5.
112	2	The fair alarm ppm setpoint of co2 sensor.
113	2	The poor alarm ppm setpoint of co2 sensor.
114	1	co2 alarm status: 0b'xxxx 1xxx': co2 poor 0b'xxxx 01xx': co2 fair 0b'xxxx 001x': co2 good
115	1	the version number of humidity sensor
116	2	the relative humidity
117	2	the frequency value read from humidity sensor, read only
118	1	the number of calibration points of the humidity sensor
119	2	degree celsius temperature value of the humidity sensor
120	2	degree fahrenheit temperature value of the humidity sensor
121	2	celsius degree temperature value of the on board thermistor sensor
122	2	fahrenheit degree temperature value of the on board thermistor sensor
123	2	the offset for calibrating the on board thermistor sensor
124	1	select the temperature direct to analog output: 0: on board thermistor sensor, default setting

## CO2-Humidity-Temp Transmitter w/ Bacnet

Address	Bytes	CO2-Node Modbus Register Description
125	1	select the temperature unit direct to analog output: 0: degree celsius 1: degree fahrenheit, default setting
126	2	Lighting value, for feature
127	1	analog output mode, change it by setting the jumper (J20) on the board, read only
128	2	the minimum value of temperature directs to the analog output
129	2	the maximum value of temperature directs to the analog output
130	2	the minimum value of humidity directs to the analog output
131	2	the maximum value of humidity directs to the analog output
132	2	the minimum value of co2 directs to the analog output
133	2	the maximum value of co2 directs to the analog output e.g. co2 output: if the co2 ppm is 1000, the (minimum value, maximum value) = (0, 3000), then 1. setting J20 to select 0V-10V output mode, so the co2 output is about $((1000\text{ppm} / (3000\text{ppm} - 0\text{ppm})) * (10\text{V} - 0\text{V})) + 0\text{V} = 3.3\text{V}$ 2. setting J20 to select 0V-5V output mode, so the co2 output is about $((1000\text{ppm} / (3000\text{ppm} - 0\text{ppm})) * (5\text{V} - 0\text{V})) + 0\text{V} = 1.65\text{V}$ 3. setting J20 to select 4mA-20mA output mode, so the co2 output is about $((1000\text{ppm} / (3000\text{ppm} - 0\text{ppm})) * (20\text{mA} - 4\text{mA})) + 4\text{mA} = 9.3\text{mA}$

500		co2 automatic compensation background enable or disable. 0 = Disable, 1 = Enable
501		"Background CO2", default is 400ppm, minimum is 390, max is 500. "
502		Maximum adjustment per day" default is 1ppm, max is 10 ppm, minimum is 1
503		"Number of days to watch for minimum" , default is 7 days. Max is 30 days. Minimum is 2 days.
505		co2 background calibration offset

## CO2-Humidity-Temp Transmitter w/ Bacnet

Value	CO2-Node Bacnet Object Description
AV1	SerialNumber LowByte
AV2	SerialNumber HighByte
AV3	SoftWare Version
AV4	Modbus id
AV5	Product Model
AV6	Instance
AV7	Station Number
AV8	BaudRate
AV9	Update
AV10	Protocol switch. 0 = MODBUS,1=MSTP.
AV11	Auto/Manual,Analog output auto/manual control. Bit 1 directs to temperature output, 0=Auto, 1=Manual.
AV12	Dew Point
AV13	Passwords
AV14	Mixing Ratio, the mass of water over the mass of dry gas, [g/kg]
AV15	Enthalpy of the air, [kJ/kg]
AV16	Spare
AV17	Temperature Offset
AV18~AV19	Spare
AV20	Temperature Filter
AV21	Spare
AV22	Temperature Unit
AV23	Output Mode
AV24~ AV25	Spare
AV26	Minimal Range for temperature
AV27	Maxium Range for temperature
AV28~AV30	Spare
AV31	Temperature Setpoint
AV32	Spare

## CO2-Humidity-Temp Transmitter w/ Bacnet

Analog Input	Analog Input and Description
AI1	Spare
AI2	Temperature
AI3	Spare

Analog Output	Analog Output and Description
AO1	Spare
AO2	Temperature
AO3	Spare