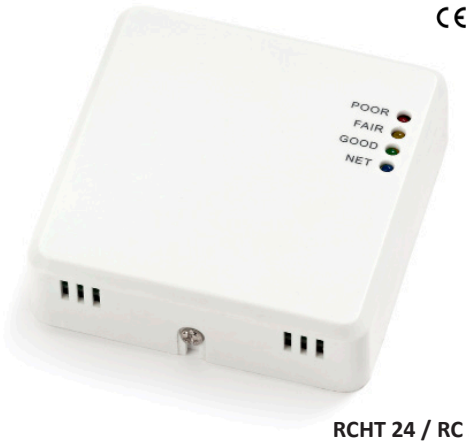
Room - CO_2, Humidity and Temperature Detector Modbus RTU, Traffic Light

RCHT 24
RC 24

May. 15



RCHT 24 / RC 24

Features

- **High performance sensing elements, temperature compensated, stable**
- **Modbus RS485 with 4-20mA, 0-10Vdc and 0-5Vdc outputs**
- **Optional colours, e.g. red**

Traffic lights		Levels (ppm)
Poor	Red	1000 - 2000
Fair	Yellow	800 - 1000
Good	Green	450 - 800
Net	Blue	Good Communication

Technical Data

Typical Application	Indoor Wall Mount	
Output Signal Type	Jumper select: 4-20mA, 0-10Vdc, 0-5Vdc	
Output Signal Drive	> 500Ω for mA mode, 75mA max output drive for voltage mode	
Power	12-24V +/- 10%, ac/dc, 1 watt typical	
Operating Temp	0 to +50°C, 0-95%rH non-condensing	
Plastic Housing	Flammability rating UL 94V0 file E194560	
Traffic Lights	4 LEDS	
CO_2	Sensor Type	Dual Beam NDIR
	Range	0 - 2000ppm, adjustable
	Accuracy	±70ppm or ±5% of reading
	Drift	<50ppm / year full scale
HUM	Sensor Type	Capacitive
	Range	0-100%rH Non-Condensing
	Accuracy	5%@25°C, 20 to 80%rH
	Drift	< 0.5% rH / year
TEMP	Sensor Type	10K thermistor
	Range	-30 to 70°C
	Accuracy	< ±0.5°C @25°C
Size	80.45 x 80.45mm (3.167 x 3.167in)	

Design Features

RCHT 24 is an indoor wall mount CO_2, temperature & humidity detector designed for environment monitoring and controlling in:

- industrial
- commercial
- other buildings

Use in the traditional mode for analog output to other controllers or use Modbus RS485 to integrate over the network.

Traffic Lights

This external CO_2 detector uses the sensor module to calculate the current CO_2 levels and uses a simple “Red/Yellow/Green” LED display to show the quality and safety of the air.

When connected to the detector it will display detailed information about the current CO_2 count.

It can also accurately monitor temperature.

Order Code

RCHT 24	Indoor wall mount CO_2, hum. & temp. detector
RC 24	Indoor wall mount CO_2 detector

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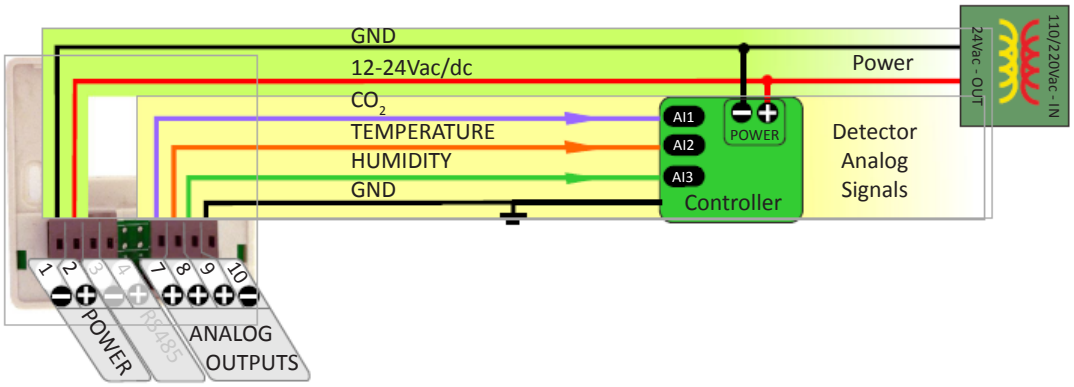
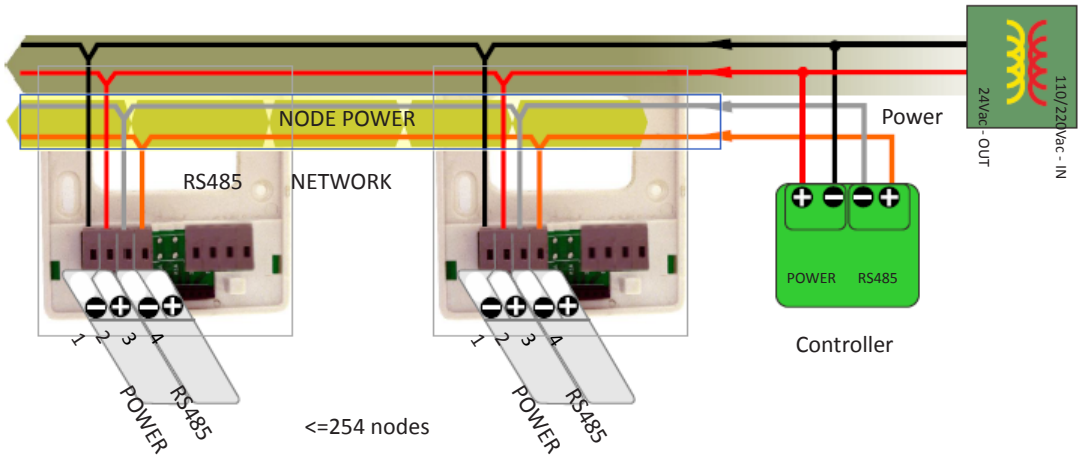
Wiring Diagram

The diagram below shows the wiring for the usual detector mode of operation for the RCHT 24.
The detector outputs connect to a master controller using the traditional analog output signals.



The diagram below shows the RCHT 24 working in the RS485 network; the node quantity can be up to 255 units.

A group of sensors distributed through the building can cooperate friendly through net.
The RS485 network is available for transmitting the same values digitally to other controllers.



Colour options are available

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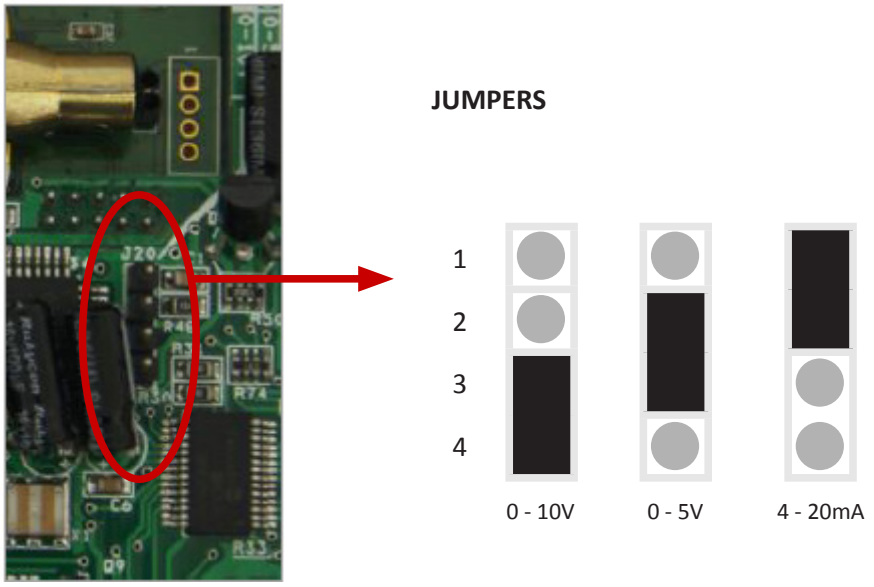
Jumper Settings

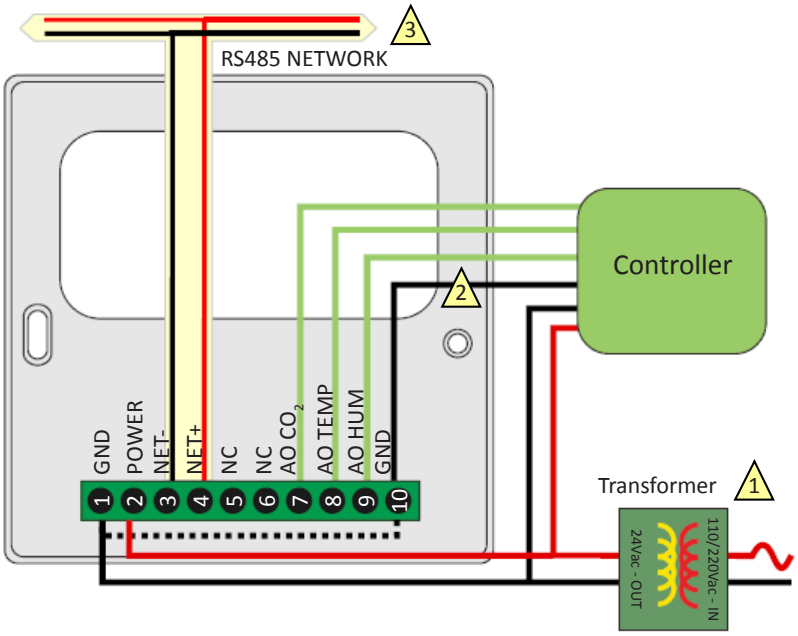
In this mode the device acts as a traditional transducer where it sends out three analog signals which are CO_2, humidity and temperature readings.

All you need to do is to set this one single jumper to the appropriate signal type:

- 4-20mA, 0-10Vdc, or 0-5Vdc.

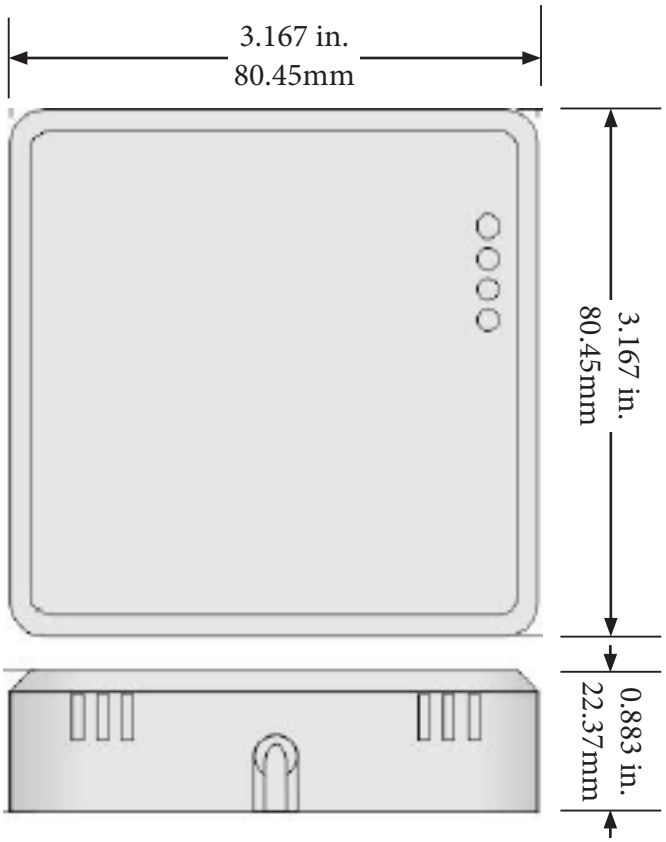


Backplate Wiring



1. Power Supply, 12 to 24Vac/dc
2. Suggested GND from sensor to controller for signal return path
3. RS485 Net, 18ga twisted pair typical, optional ground & shield

Dimensions



Colour Code

[ppm]	Air Quality
2100	BAD Heavily contaminated indoor air Ventilation required
2000	
1900	
1800	
1700	
1600	
1500	MEDIOCRE Contaminated indoor air Ventilation recommended
1400	
1300	
1200	
1100	
1000	FAIR
900	
800	GOOD
700	
600	EXCELLENT
500	
400	

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	ROOM TEMPERATURE reading in Deg from the sensor selected by TSS. Writing a temperature value to this register will calibrate the tstat by automatically adjusting the calibration register
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 through 4 = relay 1 through 5.
109	2	CALIBRATION, this is the calibration factor for the internal sensor, normally maintained by the tstat.
110	2	"CALIBRATION_EXTERNAL , this is the calibration factor for the external sensor, normally Maintained by the tstat."
111	1	TEMP_SELECT, Sensor to be used for the PID calculations, 0 = internal sensor IC, 1= external sensor, 2 = internal thermistor, 3 = average the internal thermistor and external sensor
112	1	DAC_OFFSET , Calibration data for the 0-10VDC signal, internal variable maintained by tstat
113	1	NOT USED FOR REV 25
114	1	PTERM , proportional term for PI calculation
115	1	ITERM , integral term for PI calculation
116	1	NOT USED FOR REV 25
117	1	NOT USED FOR REV 25
118	1	SEQUENCE , control sequence i.e. fancoil, heatpump etc.
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.
121	1	DEGC_OR_F, engineering units, Deg C = 0, Deg F = 1
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
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."

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Address	Bytes	Register and Description
128	1	"KEYPAD_SELECT , variable to select various keypad arrangements. Refer to PAd description in Table 1: Advanced Menu Items" “Number of buttons on the keypad The keypad can have up to six buttons. The setting is not normally adjusted in the field. Care should be taken to coordinate with the settings in register 106, the Heat / Cool changeover parameter 128=0 , two buttons, for adjusting the setpoint. 128=1 , 4 buttons, lower pair for the mode and upper pair for the setpoint. 128=2 , 6 button keypad, with heat cool manual selection. Lower pair for the mode, next pair for the setpoint and upper pair for the heat or cool mode. 128=3 , 6 button keypad, with separate heating and cooling setpoints. Lower pair for the mode, next pair for the cooling setpoint and uppermost pair for the heating setpoint.”
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."
130	1	NOT USED FOR REV 25
131	1	MAX_SETPOINT, Setpoint high, the highest setpoint a user will be able to set from the keypad.
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"
134	1	FACTORY_DEFAULTS, Reset all parameters to the factory settings
135	1	COOLING_SETPOINT, current cooling setpoint - limits are set by the max and min setpoints
136		NOT USED FOR REV26
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

Address	Bytes	Register and Description
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
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
Analog output OFF table, coasting mode		
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
180	2	External Sensor 1 - Filtered, calibrated value for analog in 1
181	2	External Sensor 2 - Filtered, calibrated value for analog in 2
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=9600, 1=19.2kbaud
186	1	Ou1 - Output1 Scale - 0=On/Off, 1=0-10V, 2=0-5V, 3=2-10V, 4= 10-0V , 5=4-20mA(for CO2)
187	1	Ou2 - Output2 Scale - 0=On/Off, 1=0-10V, 2=0-5V, 3=2-10V, 4= 10-0V
188	1	AI1 – Analog input 1 range 0=10-bit raw data, 1=10K thermistor, 2=0-100%, 3=on/off, 4=custom
189	1	AI2 – Analog input 2 range 0=10-bit raw data, 1=10K thermistor, 2=0-100%, 3=on/off, 4=custom
190	1	dI1 – Digital input 1 range 0 = ON/OFF.
191	1	OUTPUT1_DELAY_OFF_TO_ON – delay time for output1 going from OFF to ON (sec)

Address	Bytes	Register and Description
192	1	OUTPUT2_DELAY_OFF_TO_ON – delay time for output2 going from OFF to ON (sec)
193	1	OUTPUT3_DELAY_OFF_TO_ON – delay time for output3 going from OFF to ON (sec)
194	1	OUTPUT4_DELAY_OFF_TO_ON – delay time for output4 going from OFF to ON (sec)
195	1	OUTPUT5_DELAY_OFF_TO_ON – delay time for output5 going from OFF to ON (sec)
196	1	OUTPUT1_DELAY_ON_TO_OFF – delay time for output1 going from OFF to ON (sec)
197	1	OUTPUT2_DELAY_ON_TO_OFF – delay time for output2 going from OFF to ON (sec)
198	1	OUTPUT3_DELAY_ON_TO_OFF – delay time for output3 going from OFF to ON (sec)
199	1	OUTPUT4_DELAY_ON_TO_OFF – delay time for output4 going from OFF to ON (sec)
200	1	OUTPUT5_DELAY_ON_TO_OFF – delay time for output5 going from OFF to ON (sec)
201	1	"MODBUS_CYCLING_DELAY – delay time (in minutes) for switching out of heating or cooling and then back in."
202	1	"MODBUS_CHANGOVER_DELAY – delay time (in minutes) for switching from cooling into heating or vice versa."
203	1	"dIS – Display. This sets the display to either room temperature or setpoint. 0 = room temp, 1 = setpoint, 2 = Blank Display,3 = PID2 value,4 = PID2 setpoint, 5 = set segment code by manually, 6 = Display sleep"
LED TABLE: Determines what activates the LEDs		
204	1	LED1 (top left to bottom right)
205	1	LED2
206	1	LED3
207	1	LED4
208	1	LED5
209	1	LED6
210	1	LED7
211	1	Unoccupied Override Timer, Ort. 0=disabled, not 0=number of minutes manual override is allowed
212	1	"OVERRIDE_TIMER_DOWN_COUNT - Number of minutes remaining on the timer when unoccupied override timer is in effect."
213	1	Temperature sensor filter, FIL, weighted average of stored value to new raw value
214	1	"Heating cooling mode configuration, HC, 0=PID, 1=Keypad, 2=Digital_in1, 3=Digital_in1, 4=Analog_in1, 5=Analog_in2"
215	2	"Internal Temperature Sensor IC - Shows the filtered, calibrated value of the internal temperature sensor IC"
216	2	Internal Thermistor Sensor - Shows the filtered, calibrated value of the internal thermistor sensor
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

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Address	Bytes	Register and Description
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
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
247	1	Output 1 PID Control 0 = PID1
248	1	Output 2 PID Control 1 = PID2
249	1	Output 3 PID Control 2 = Maximum of PID1 and PID2
250	1	Output 4 PID Control 3 = Minimum of PID1 and PID2
251	1	Output 5 PID Control
252	1	Output 6 PID Control
253	1	Output 7 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
271	2	PID1 Units High byte - Upper 2 bytes of the PID1 units in ASCII
272	2	PID1 Units Low byte - Lower 2 bytes of the PID1 units in ASCII
273	2	PID2 Units High byte - Upper 2 bytes of the PID2 units in ASCII
274	2	PID2 Units Low byte - Lower 2 bytes of the PID2 units in ASCII
275	2	Universal Night Setpoint
276	1	Number of Heating Stages in Original Table - (Maximum # of total heating and cooling states is 6)

Address	Bytes	Register and Description
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.
280	1	Determine the output1 mode. Output1 always is ON/OFF mode
281	1	Determine the output2 mode. Output2 always is ON/OFF mode
282	1	Determine the output3 mode. Output3 always is ON/OFF mode
283	1	Determine the output4 mode. 0, ON/OFF mode; 1, floating valve for cooling; 2, lighting control; 3, PWM
284	1	Determine the output5 mode. 0, ON/OFF mode; 1, floating valve for heating; 2, lighting control; 3, PWM
285	1	Valve percent. Show the valve opened how much percent. READ ONLY
"Interlock for each output, analog and digital output. 0, interlock always ON; 1, DI1 determine the interlock status ; 2, AI1 determine the interlock status, the range of AI1 must be ON/OFF; 3, AI2 determine the interlock status, the range of AI2 must be ON/OFF; 4, TIMER OR, the output OR with the period timer; 5, TIMER AND, the output AND with the period timer."		
286	1	Interlock for output1
287	1	Interlock for output2
288	1	Interlock for output3
289	1	Interlock for output4
290	1	Interlock for output5
291	1	Interlock for output6
292	1	Interlock for output7
293	1	Setpoint increment. The value is expanded 10 times, the increment is from 0.1 to 1.
294	2	"Last key pressed counter. Long long time past since the last key pressed. Reset if any key is pressed. The units is minute."
295	1	"Freeze protect setpoint. If the ambient temperature less than the setpoint, the heating valve will open some time the Delay to off register set ."
296	1	"Delay to open. The heating valve will open if the ambient temp less than the Freeze temp setpoint last the time this register set. The units is second."
297	1	Delay to close. The duration the heating valve open. The units is minute.
298	1	"Analog input1 function selection. 0, normal; 1, freeze protect sensor input; 2, occupancy sensor input; 3, sweep off mode; 4, clock mode; 5, change over mode. Refer to dI1 on page13."
299	1	Analog input2 function selection. 0, normal; 1, freeze protect sensor input; 2, occupancy sensor input; 3, sweep off mode; 4, clock mode; 5, change over mode. Refer to dI1 on page13.
300	1	dI1 – Digital input 1 function. Refer to dI1 description in Table 1: Advanced Menu Items
301	2	Period timer ON time.
302	2	Period timer OFF time.
303	1	Period timer units. 0, second; 1, minute; 2, hour.
304	1	Keypad encode value. The reverse value read from P0 port when some key is pressed. READ ONLY
305	1	LED hundred's segment code. Drive the LEDs by manually, the register 203(display) must be set 5.
306	1	LED ten's segment code. Drive the LEDs by manually, the register 203(display) must be set 5.
307	1	LED digital's segment code. Drive the LEDs by manually, the register 203(display) must be set 5.
308	1	LED status's segment code. Drive the LEDs by manually, the register 203(display) must be set 5.
309	1	"Input auto/ manual enable. Bit0 correspond to analog input1(register 180); bit1 to analog input2(register 181); bit2 to digital input1(register 311). 0, auto mode, the corresponding input value from sensor; 1, manual mode, the corresponding value from serial port. "
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."
311	1	Digital manual input. Write the manual value for digital input when digital input in manual mode.
312	1	Output1 manual input.
313	1	Output2 manual input.

Address	Bytes	Register and Description
314	1	Output3 manual input.
315	1	Output4 manual input.
316	1	Output5 manual input.
317	1	"Dead master. The Tstat will go to occupied mode automatically after the time set in the register no serial communication since power on. 0, disable the function. The units is minute."
318	1	"Rouding display. 0, round the display to digit; 1, round the display to the nearest 1/10 unit; 5, round the display to the nearest 1/2 unit. 2,3,4 reserved."
319	1	The minimum device address can be set
320	1	The maximum device address can be set. The device address should between min and max address
321	1	The output 2 is controlled by which output table in the rotation group. READ ONLY.
322	1	The output 3 is controlled by which output table in the rotation group. READ ONLY.
323	1	The output 4 is controlled by which output table in the rotation group. READ ONLY.
324	1	The output 5 is controlled by which output table in the rotation group. READ ONLY.
325	1	Rotation time left. Long long time left the rotation will happen. READ ONLY.
326	1	Show the size of E2 chip. 0 = 24c02, 1 = 24c08/24c16.
327	1	"Assign the timer be used for which feature. 0 = period timer, 1 = rotation timer, 2 = interlock, 3 = PWM timer."
328	1	"The output1 function, there are three functions for the output1.0 = normal ON/OFF output, 1 = rotation, 2 = lighting control. "
329	1	Show which output table is using for this output when this output function be set rotation
330	1	Show which output table is using for this output when this output function be set rotation
331	1	Show which output table is using for this output when this output function be set rotation
332	1	Show which output table is using for this output when this output function be set rotation
333	2	How much time left before rotation action.
334	1	"The output2 function, there are three functions for the output2.0 = normal ON/OFF output, 1 = rotation, 2 = lighting control."
335	1	"The output3 function, there are three functions for the output3.0 = normal ON/OFF output, 1 = rotation, 2 = lighting control."
336	1	"The output4 function, there are three functions for the output4.0 = normal ON/OFF output, 1 = rotation, 2 = lighting control."
337	1	"The output5 function, there are three functions for the output5.0 = normal ON/OFF output, 1 = rotation, 2 = lighting control."
338	1	Default occupied setpoint. Works in concert with the "occupied setpoint control register", register 339
339	1	Occupied Setpoint Control Register: 0 = normal, setpoint is managed by the serial port and keypad, the stat will remember the last occupied setpoint and use that during the next occupied period. 1 = Default mode, the last occupied setpoint if forgotten and the occupied setpoint gets reset to the default. 2 = trigger an event, when a master controller writes 2 to this register, the default setpoint will be copied to the occupied setpoint after which the Tstat will set the value back to 1 to show the event has been serviced.
340	1	Enable/disable PIR correspond 1/0 respectively.
341	1	"PWM output range in COAST mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
342	1	"PWM output range in COOLING2 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
343	1	"PWM output range in COOLING3 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
344	1	"PWM output range in COOLING1 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
345	1	"PWM output range in HEATING1 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"

Address	Bytes	Register and Description
346	1	"PWM output range in HEATING2 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
347	1	"PWM output range in HEATING3 mode. 0 = CLOSE, 1 = OPEN, 2 = 0-100%, 3 = 50-100%, 4 = 0-50%. MSb 4 bits correspond to output4 and LSB 4 bits correspond to output5"
348	1	The ON period take how many percentage for output4
349	1	The ON period take how many percentage for output5
350	1	"Free cooling configuration. bit0, free cool enable/disable, 0 = disable, 1= enable. bit1, free cool available decided by local or external master. 0 = local, 1 = NC. bit2, free cool available status, 0 = npt available, 1= available. bit4, show the status if NC is OK when the free cool decided by NC."
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
358	1	"Register lock. All registers except fan speed and manual inputs/outputs register are not writable. 0 = lock,1 = no lock."
359	1	Outside temperature for free cooling,from external sensor or NC.
360	2	"If outside temp be set from NC. The communication with NC must be set in this time,otherwise will set error status and use external sensor."
361	1	"If the outside air temp is lower than the room temperature by this amount, then the free cooling is worthwhile, 350 bit2 = 1.If the OAT is greater than the room temp, then free cooling mode is not worthwhile. , 350 bit2 = 0"
Output table in free cooling mode,0 = 0%, 1 = 100%,2 = MIN->100%,3 = MIN|100%,4 = MIN.Bit7 through 4 correspond to OFF table,bit 3 through 0 correspond to ON table.		
362	1	Free cooling output configuration. Coasting mode
363	1	Free cooling output configuration.Cooling1 mode
364	1	Free cooling output configuration.Cooling2 mode
365	1	Free cooling output configuration.Cooling3 mode
366	1	Free cooling output configuration.Heating1 mode
367	1	Free cooling output configuration.Heating2 mode
368	1	Free cooling output configuration.heating3 mode
369	1	Min Air,the units is percent. Set the minimum output for free cooling, the default is 15%
370	1	Outside air temperature in hottest day
371	1	Outside air temperature in coldest day
372	1	Offset in hottest day
373	1	Offset in coldest day
374	1	Store setpoint in two bytes, the resolution is 0.1
375	1	Crrent setpoint = user setpoint + offset setpoint
376	1	Setpoint offset
377	1	Change over sensor mode, 1 = cooling mode, 0 = heating mode.
509	2	CO2 value,UNIT: ppm,range:0-2000ppm