

Room Controller

Description

The Room Controller - Relaypack is a multi-function controller system with built-in PID functions for climate controls. It is an entirely new intelligent guest room controls and with its RS-485 hardware architecture that combines the advance engineering to further network to a central computer for online room management system.

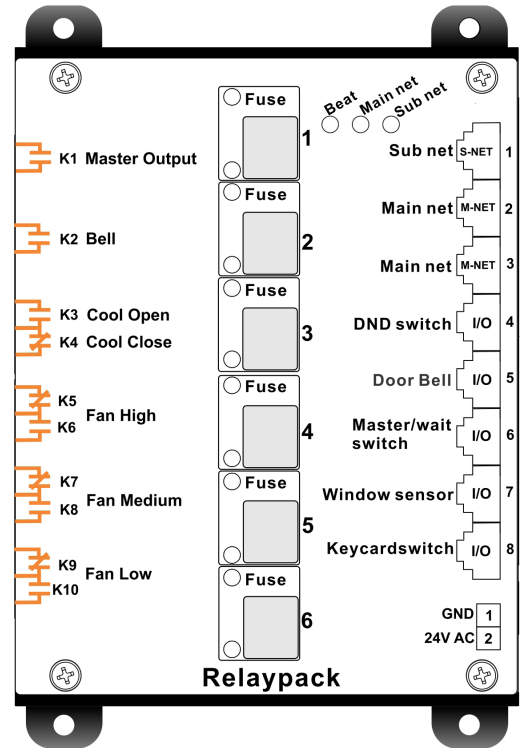
It integrates with other controllers and field devices via UTP cable to control all amenities within the guest room, including Master On/Off lighting control, Multi-mode air conditioning control, Do Not Disturb, Bell Switch, Window Sensor etc.

Highlights

- Multi-function controller system for climate controls;
- Easy to install and maintain;
- RS-485 hardware architecture, Zigbee optional;
- Built-in Intelligent Aircon Controls improves energy efficiency.
- Well documented register list for easy integration with other systems.

Specifications

Power requirement	24 AC External
Power consumption	20ma@24VDC
Relay contacts rating	12A/125VAC 50/60Hz
Operating temperature	0°C - 55°C / 0- 95% RH
System communications	RS 485
Baudrate	115200
Material	Cold-rolled steel plate
Dimensions	143(L)x92.6(W)X39.6(H)mm

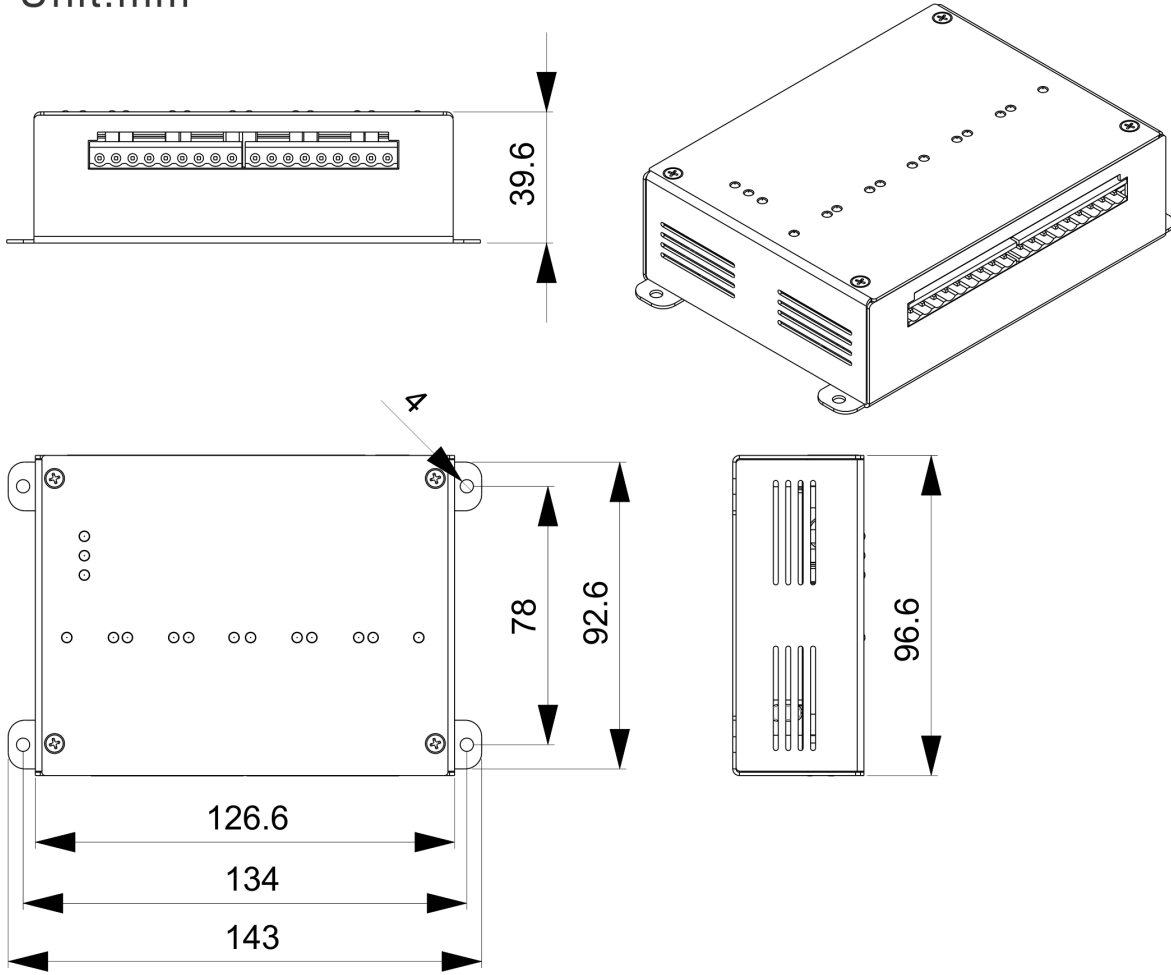


Relaypack

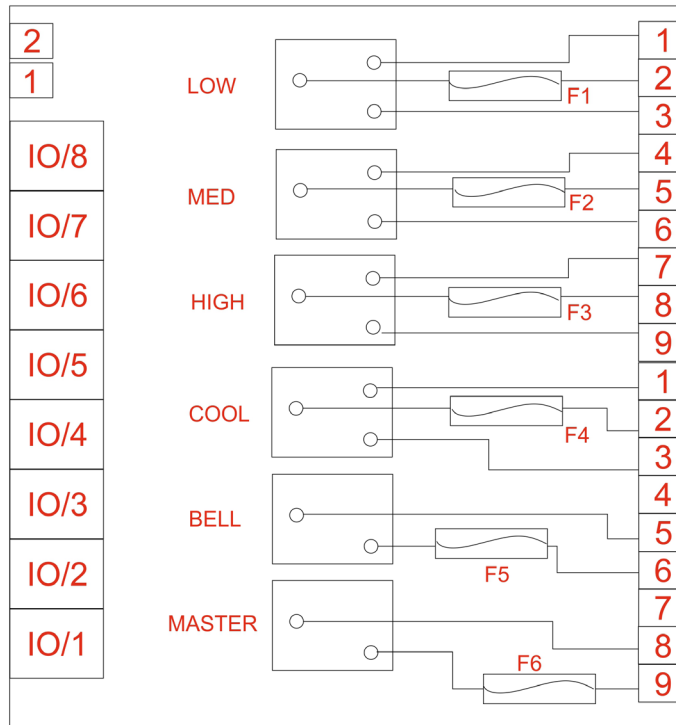
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Dimension

Unit:mm



Wiring Diagram



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Room Controller System

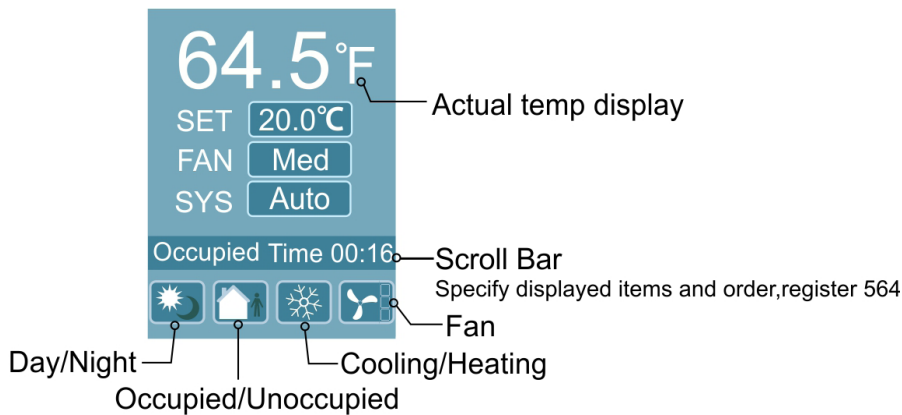
The entire system consists of a thermostat, a relay pack.

The relay pack is connected to Tstat8 via a UTP cable for both data and power. It constantly exchanges data to optimize control of the zoned environment and uses an adaptive control routine based on its logic to determine the heating and cooling load of the room. The routine calculates the load by evaluating recent room conditions and automatically switch to heating or cooling mode according to the demand.











Tstat8



Menu





Tstat8 has several menu items that can be adjusted in the field to suit the application and tune the operation of the thermostat. Following is the functionality of the buttons:

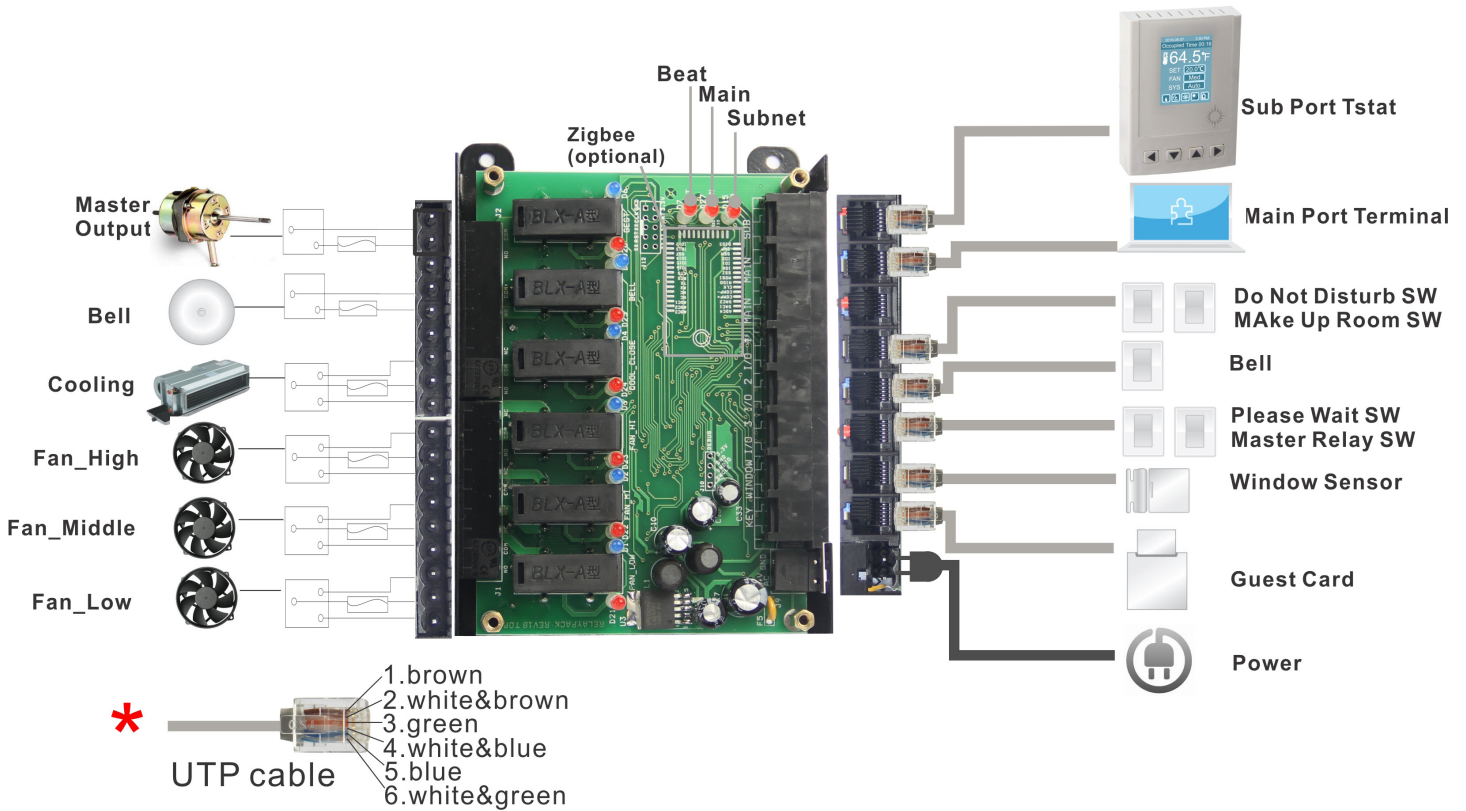
When you press  or , it will increase or decrease the set point value. The value will flash twice, then it will confirm the setting automatically.

In the normal mode, press both  and  at the same time. Hold for several seconds, it will switch to the menu mode. Press  or  to scroll through the menu options such as 'Add', 'CAL', 'bAU', 'UNITS', etc. To change the values at a particular menu, press  or , the chosen value will be stored automatically.

To change the unit's address, scroll through the menu until you reach 'Add'. Press  or  to increase or decrease the unit's address from 1 to 254.

- Decrease value 
Decreases the temperature setpoint by one degree. When in Menu Mode, adjusts each variable down.
- Increase value 
Increases the temperature setpoint by one degree. When in Menu Mode, adjusts each variable up.
- FAN
Scrolls through the 3 fan modes - LOW, MED, HI. When in Menu Mode, selects the next variable.

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The relay pack has 2 sensors connected to it *KEYSWITCH* and *WINDOW*:

- **KEYSWITCH**

The KEYSWITCH senses the presence of a key in the key slot. When there is no key in the slot, the main functionality of the buttons are disabled. (However, a user can still enter the Menu Mode to make adjustments.) The setpoint is fixed at a level controlled by the HS (Hotel Setpoint) variable in the Menu Mode. The fan speed is fixed on AUTO.

When a key is inserted the slot, the setpoint changes to a level controlled by the GS (Guest Setpoint) variable in the Menu Mode. The fan speed is fixed at HI for a number of minutes controlled by the dT (Delay Time) variable in the Menu Mode. If the room temperature reaches the setpoint within this delay time, the fan speed switches to LOW for the remainder of the delay time. At the end of the delay time, the fan speed switches to AUTO. During the delay time, the user has the ability to change the setpoint, but not the fan speed.

- **WINDOW**

The WINDOW senses if the window is open or closed. If the window is closed, operation is normal. When the window is open, the system switches off the fan and disables user control.

The DO NOT DISTURB SW& MAKE UP ROOM SW contain two switches and two indication LEDs. When the switch is on, the indication LED on; When the switch is off, the indication LED flashes.

The BELL contains one switch and one indication LED.

The PLEASE WAIT SW&MASTER RELAY SW contain two switches and two indication LEDs. When the switch is on, the indication LED on, then auto off 5 second later.

The GUEST CARD is a digital coding switch input, used to indicate the state of the guest card insertion.

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Relaypack Modbus Register List

The Relaypack uses Modbus protocol to communicate with others. Below is Modbus register list .

Address	Bytes	Default	Description
101	2		TEMEPRATURE_CHIP reading in Deg from the internal temperature sensor
102	2		COOLING_VALVE, a number from 0-100representing 0% (closed) to 100% (open)
103	2		HEATING_VALVE,a number from 0-100 representing 0% (closed) to 100% (open)
104	2		COOLING_PID,current PI calculation for cooling term
105	2		HEATING_PID,current PI calculation for heating term
106	1		COOL_HEAT_MODE,heating or cooling mode
107	1		MODE_OPERATION,heating or cooling state: heat3,2,1, daytime coasting, cooling 1 , 2, 3
108	1		DIGITAL_OUTPUT_STATE, bit 1 thru 5 = relay 1 thru 5. Bit1-3= Fan1-3, Bit 4 = Cooling, Bit 5 = Heating.
109	1		DIGITAL_INPUT Bit 1 = Key, Bit 2 = Window, Bit 3 = Digitalin3 0 = open, 1 = short
110	1	125	CL rawcalibration data for the internal sensor,
111	1	125	CE raw calibrationdata for the external sensor
112	1	0	Inputsensor – (0) internal or (1) external
113	1	100	dA Calibration data for the 0-10VDC signal
114	1	12	dL delay in seconds between switching fan speeds
115	1	20	CP coolingproportional term
116	1	10	CI cooling integral term
117	1	20	HP heating proportional term
118	1	10	HI heating integral term
119	1	1	SO sequence of operations
120	1	20	Cd cooling deadband
121	1	20	Hd heating deadband
122	1	0	CF engineeringunits, DegC or Deg F
123	1	3	FA number offan speeds
124	1	5	nH nightheating setback
125	1	1	nC night cooling setback
126	1	0	AP application: hotel, office,residential
127	1	20	PS power on setpoint,after a power failure
128	1	2	Pn power on mode, ie: off, on,last
129	1	1	Pd keypad arrangement, 2button, 4 button, 6 button (two types)
130	1	1	AU is auto mode allowed or not
131	1	22	GS default GuestSetpoint when room is occupied
132	1	24	HS default HotelSetpoint when room is unoccupied
133	1	0	dT Amount of timefor Fan Hi after someone enters the room
134	1	6	Id Inputdelay for window and key (seconds)
135	1	0	OU voltage condition andlevels of the valve outputs
136	1	26	SH Themaximum setpoint that the user can reach using the keypad

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137	1	17	SL The minimum setpoint that the user can reach using the keypad
138	1	5	ButtonDelay – Number of seconds between pressing a button and the reaction of the relay board
139	1	0	DefaultDisplay – sets the display to either room temperature [0] or setpoint [1].
140	1	0	FC Factory Defaults
141	1	19	COOLING SETPOINT
142	1	0	HEATING SETPOINT
143	1		Fan state, a number from 0-4 representing the current state of the fan. 0 is off, 1,2,3 Are low med hi, 4 is auto.

Tstat8 Modbus Register List

The Tstat8 uses Modbus protocol to communicate with others. Below is Modbus register list .

Tstat8	Count	Register and Description
0 to 3		Serial Number - 4 byte value. Read-only
4 to 5		Software Version– 2 byte value. Read-only
6		ADDRESS. Modbus device address
7		Product Model. This is a read-only register that is used by the microcontroller to determine the product
8		“Hardware Revision. This is a read-only register that is used by the microcontroller to determine the hardware rev”
9		PIC firmware version
10		PIC version of Humidity module
11		“PLUG_N_PLAY_ADDRESS, ‘plug n play’ address, used by the network master to resolve address conflicts. See VC code for algorithms”
14		Spare
15		Bau - Baudrate, 0=9.6kbaud, 1=19.2kbaud 2=38.4kbaud 3=57.6kbaud 4=115.2kbaud 5=76.8kbaud 6=1.2kbaud 1=4.8kbaud 1=14.4kbaud
16		Firmware Update Register, used to show the status of firmware updates. Writing 143 sets the config back to out of the box except for Modbus ID and baud rate. Write 159 to fix the current config as the user defaults, this is done automatically by T3000 any time a config file is loaded. Writing 175 resets the unit back to the user defaults.
17~19		Spare
20		Hardware Options Register, starting with LSB: Bit0=Clock present or not, Bit1 = Humidity present or not, Bit2 = CO2 Sensor, Bit3=CO sensor, Bit4 = Motion Sensor
21		PANID for zigbee devices
22		Device type of zigbee. 0 means coordinator, 1 means router
23~24		Channel of Zigbee, default channel is channel 13, 0x00002000
25		Zigbee module software revision
26~33		Zigbee extended address(MAC address)
34		Set 1 to reboot zigbee module
35~50		Security key
51		The number of zigbee neighbour around

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52		The modbus ID of the 1st zigbee neighbour
53		The signal strength of the 1st zigbee neighbour
54		The modbus ID of the 2nd zigbee neighbour
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For more register list details, please download an excel spreadsheet (ModbusBacnetRegisterList.xls) as the following link: <https://tinyurl.com/ybaj9d3u>.