

RTC2 BACnet FAN COIL CONTROLLER / THERMOSTAT



BACnet Enabled

Description

The RTC2 temperature controller incorporates a LCD display and is specifically designed for zone temperature control or fan coil control. The controller can be used in stand-alone applications or part of a BMS system via the standard inbuilt Native BACnet MS/TP communications.

There are two control output types available and these are 0-10V for analogue control of heat/cool or 24VAC triac outputs that can be configured for On/Off control or TPC actuator control of PWM. In both types when used for fan coil control the fan output is a stepped 0 to 10V signal and requires a load interface relay module which depends on the number of fan stages to control.

Features

- 24V AC supply
- Native BACnet communications
- 0-10V Analogue or 24VAC Triac control outputs
- 1 x 0-10V step voltage output for fan control
- 1 x 0-10V Analogue output for remote signalling
- On/Off, ECO, Frost settings or High Limit
- 3 stage fan control via interface relay module
- 1 x 10K3 temperature sensor input
- Flush or surface mounting
- Decorative Finishes available

Specification

Supply	24VAC
Power consumption	20mA (plus outputs)
Triac outputs	350mA max
0-10V outputs	5mA max
Temperature Sensors	10K3A1
Analogue Inputs	0-10V
Digital Inputs	Voltfree
Communications	Native BACnet
Network	MS/TP -RS485
Indication	Digital Display
Enclosure	Wall Mounting (IP20) L94-VO
Size	Flush:-150 mm wide x 80 mm high x 6 mm deep Surface: 150 mm wide x 60 mm high x 28 mm deep

Display Setting Options

The RTC2 inbuilt display will allow user selection of temperatures, fan speed. The display also provides access to amend the controller default settings and functions. All the settings can also be modified over the BACnet communications interface.

PART CODES

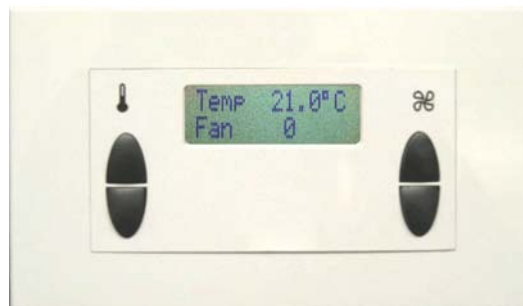
RTC2/T/F/BAC/W	Flush white plate mounted Fan Coil Controller with 4x24V Triac Outputs with white finish
RTC2/T/F/BAC/PSS	Flush white plate mounted Fan Coil Controller with 4x24V Triac Outputs with Polished Stainless Steel finish
RTC2/T/F/BAC/BSS	Flush white plate mounted Fan Coil Controller with 4x24V Triac Outputs with Brushed Stainless Steel finish
RTC2/T/BAC/S	Surface box mounted Fan Coil Controller with 4 x 24V Triac Outputs
RTC2/A/F/BAC/W	Flush white plate mounted Fan Coil Controller with 2 x 0-10V Outputs with white finish
RTC2/A/F/BAC/PSS	Flush white plate mounted Fan Coil Controller with 2 x 0-10V Outputs with Polished Stainless Steel finish
RTC2/A/F/BAC/BSS	Flush white plate mounted Fan Coil Controller with 2 x 0-10V Outputs with Brushed Stainless Steel finish
RTC2/A/BAC/S	Surface box mounted Fan Coil Controller with 2 x 0-10V Outputs

Control Settings

The settings listed describe the range of the standard settings, options and operational features that are resident in the RTC2 controller and these can be accessed via the inbuilt digital display.

USER DISPLAY & SETTINGS

The display defaults to the user settings and these are shown as follows: -



Control Temperature & Fan Speed selection are displayed. The left hand buttons allow the adjustment of the temperature setpoint and the right hand buttons are used to select the fan speed or to switch the controller On/Off.



COMMISSIONING & CONTROLLER SETTINGS

SECTION -1

The RTC2 is available with 4 x Triac controlled outputs for (ON/Off, PWM or TPC) or 2 x 0-10V analogue control.

The RTC2 is an applications specific controller and as such holds a number of default settings dependant on the type (Triac or 0-10V). This document covers both the Triac and Analogue control versions.

To access the set up routines and commissioning put DIL switch 4 on the back of the controller to ON. If the controller is connected to a system network with the MAC and Device ID address's set then all the controller setting can be done through the central supervisor.

When in the commissioning/set-up mode press the right hand buttons to scroll through the set up options and press the left hand buttons until your desired control selection or setting is displayed.

In the commissioning setup the following is the sequence of functions displayed when scrolling with the right hand top push button

Backlight On Time (1 to 60 secs)

```
B a c k l i g h t
V a l u e       : 10
```

The RTC display is backlit and the on time can be selected from 1 to 60 seconds by using the left hand buttons.

Temperature Units to be displayed ('C or 'F)

```
T e m p   U n i t s
V a l u e   : ' C '
```

This selects the temperature units that will be used in all related temperature settings

Network/Communications (BACnet or None)

```
N e t w o r k
B A C n e t
```

When the RTC2 controller is used on a communications network then BACnet must be selected. Ensure that None is selected when the RTC2 is not part of a networked system. **Go to Section 2 if NONE (no network is selected)**

Device Type (Master or Slave)

```
D e v i c e   T y p e
M a s t e r
```

This selection allows the RTC to operate as a Master or Slave node on the BACnet network. Consult the TITAN Products BACnet. Always set this in Master mode and consult TITAN Technical Reference Document for future information.

Unit Address (Unique MAC address)

```
U n i t   A d d r e s s
V a l u e   : 50
```

This setting corresponds to a unique MAC address on the local MS/TP network. It is limited to a maximum of 127 for a Master device and 254 for a Slave device

Baud Rate (9600, 19200, 38400 or 76800)

```
B a u d   R a t e
V a l u e   : 3 8 4 0 0
```

This setting must match the MS/TP network Baud Rate and all other devices on the network.

Device Object ID (Unique Network Wide Number)

```

D e v O b j e c t I D
0 0 0 0 0 0 0
    
```

This setting is the unique inter-network wide BACnet Device object Identifier. The setting defaults to 0000000 and communications can not be established until a valid ID is entered. Consult the TITAN Products BACnet Technical Reference Document before making an entry.

Use the left hand buttons to enter a number in each cell and the right hand buttons to scroll across the display cells.

SECTION 2- The following are the normal controller settings, defaults and selections.

Offset (+/- 10°C in 0.1 increments)

```

O f f s e t   + / -
V a l u e    : 1.0
    
```

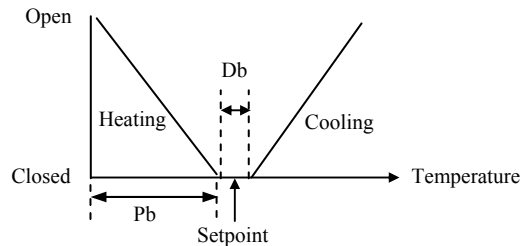
A temperature Offset can be used to compensate for any variances between the actual sensor position and the local area. Use the left hand buttons. The value is + or - from the actual measured temperature.

Dead Band Db (Default 1 range 0-10°C)

```

D e a d   B a n d
V a l u e : 1.0
    
```

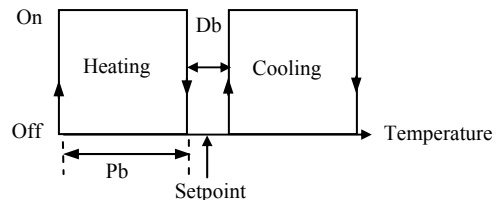
The Db is the temperature value in °C where no control action takes place and is the value between the heating and cooling cycles.



Proportional Band Pb (Default 2°C range 0.5 to 10°C)

```

P r o p   B a n d
V a l u e : 2.0
    
```



This sets the proportional control for each output and is the range in °C for which the output will travel its full value of 0-10v. On a Triac type output this value represents fully closed to fully open and is the value of the On/Off differential when used as a thermostat controller

Integral Time (Default 20 seconds, range 10 to 100 secs)

```

I n t e g   T i m e
V a l u e   : 20
    
```

This setting allows a control damping action (in time) which can be used to slug the control response to stop hunting.

Maximum Setpoint Value (Default 30°C range 15-30°C)

```

M a x i m u m   S P
V a l u e       : 30.0
    
```

This setting is the maximum value allowed for the controller Setpoint and is designed to limit the setting range when required.

Minimum Setpoint Value (Default 15°C range 15-30°C)

```

M i n i m u m   S P
V a l u e       : 15.0
    
```

This setting is the minimum value allowed for the controller Setpoint and is designed to limit the setting range when required.

Default Controller Setpoint (range 15-30°C)

```

D e f a u l t   S e t P
V a l u e   : 21.0
  
```

This is the default setpoint that the controller will operate to and is adjustable 15-30°C (See Minimum and Maximum Setpoint values)

Fan Control (Auto/Manual)

```

A u t o   F a n
N o
  
```

This selection is for the Fan Speed to change automatically on temperature or only by manual adjustment. If **Yes** (Auto) is selected then the following display is presented next with a value of temperature control to be entered.

Fan Stage (range 1-3°C) **This display only appears if Yes is selected above**

```

F a n   S t a g e
V a l u e   : 1.0
  
```

This setting is for the temperature switching level between each of the Fan speeds in Auto Fan Control and represents the control point for each fan stage either side of the setpoint for the heating and cooling cycle.

Fan Speeds (Settings 1, 2, or, 3)

```

F a n   S p e e d s
V a l u e   : 3
  
```

This setting allows the selection of the number speeds the controller will operate 1 (single speed) or 3 speed

Default Fan Speed (Default settings 0, 1, 2, 3)

```

D e f a u l t   F a n
V a l u e   : 1
  
```

If you are using a remote ON/Off signal or in the event of power failure When the controller is switched On the fan will resume operation at the default selection.

Display Options for Fan Speed (Digital 0,1,2,3 or Text Off, low, Med, High)

```

F a n   S p e e d
D i g i t a l   D i s p
  
```

Use the left hand buttons to select Digital or Text to be displayed of Fan operation.

Fan Push Button Override (Yes or No)

```

F a n   P B   O r i d e
Y e s
  
```

If Yes then this selection allows the controller to be overridden ON by pressing the top fan button. To switch Off when in an Override ON condition use the Fan buttons

Fan Overrun (0-15mins)

```
F a n   O v e r r u n
V a l u e : 1 5
```

This setting allows the fan output from the controller to be ON for a period of time after the controller is switched Off. This is for heat dissipation were electric heater batteries are used

Display Room Temp or Setpoint Only

```
D i s p l a y
R o o m   T e m p
```

Use left hand buttons to select Set Point if you do not want the actual temperature to be displayed on the controller.

Motor Drive (This display only shows on Triac output type controllers only)

This selects the type of control required when using the triac output version of the RTC2.

```
M o t o r D r i v e
V a l u e   : T P C
```

The selections are:-

0/1: - On Off control (use for thermostat control with On/Off on the heating and cooling triacs See connection diagrams)

TPC: - Time Proportional Control for raise/lower actuators

PWM: - Pulse Width Modulation for thermal type actuators

Dependant on the selection made one of the following two displays will be presented.

TPC Selection (10 to 360 secs) shows only when TPC control is selected.

```
T P C   T i m e
V a l u e : 1 5 0
```

Enter here the motor drive time to ensure control action matches the actuator run time.

PWM Selection (10 to 360 secs) shows only when PWM control is selected.

```
P W M   T I m e
V a l u e : 0 5 0
```

Enter here the motor drive time to ensure control action matches the actuator run time.

Limit Control

A second temperature sensor can be connected to the RTC which can be used for limit control (low or high) the following screens allow the set up of the limit control.

Low Limit (range 12 to 26°C)

```
L o w   L i m i t S P
V a l u e : 1 5
```

This sets the Low Limit control setpoint (range 12 to 26°C). This is used for applications where a low limit discharge air temperature is to be prevented. This feature only functions if Low Limit control is selected.

High Limit (range 30 to 40°C)

```

H i   L i m i t   S P
V a l u e   : 30
    
```

This sets a high limit value on the duct mounted discharge temperature sensor and is designed to limit the maximum temperature allowed in the supply duct.

NOTE: - Only one limit control condition can be set Low or High.

Limit Selection (Low or High)

The selects the type of limit control required

```

H / L   L i m i t
L o w
    
```

Limit Sensor (Yes No)

The selects if a limit control sensor is to be used.

```

L i m i t   S e n s o r
N o
    
```

Off/Night Setting (Off/Frost Protection/ECO)

This selects the type of condition required when the controller is switched Off from a remote signal (open circuit on ON/Off terminals).

```

N S   T y p e
O f f
    
```

If Off is selected then no further setting are required. The following display's show the setting for Frost Protection or ECO

Night Setting (Frost Protection range 5 to 18°C) only shows if Frost is selected above for NS (night setting) Type

```

F r o s t L e v e l
V a l u e   : 10.0
    
```

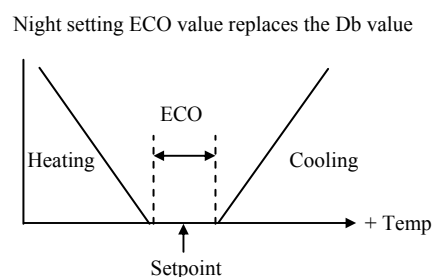
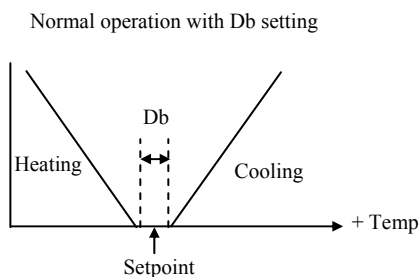
If Frost Protection is selected then you enter the frost protection level. When the controller is switched Off then the fan is switch off and the valve outputs are driven closed. Should the control sensor detect a low condition equal to the frost level then the Fan starts in the default speed and the heating valve is opened until the space temperature rises 2°C above the frost level setpoint.

Night Setting (ECO range 1-6°C) only shows if ECO is selected above for NS (night setting) Type)

```

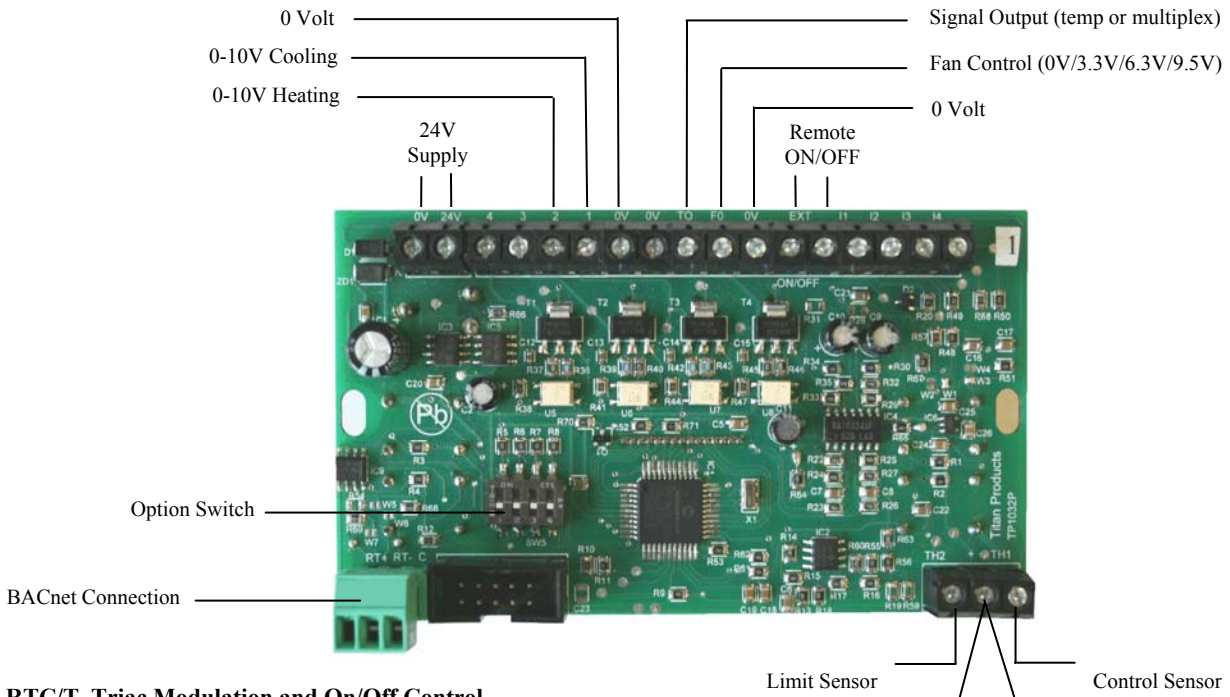
E C O   V a l u e
V a l u e   : 5.0
    
```

The ECO setting (NSB) introduces a wide dead band either side of the controller setpoint thereby increasing the cooling setpoint level and decreasing the heating setpoint level by a value equal to the ECO setting. In this condition the fan runs at the default speed continuously and temperature control is active at the setpoint (+/-) the ECO value



Connections

RTC/A 0-10V Control



RTC/T Triac Modulation and On/Off Control

