

# TC-9102 Terminal Controller

*The TC-9102 Terminal Controller, the latest addition to the application specific controller product line, is an electronic device for digital control of fan coil unit applications. Four controller models offer a competitive advantage for those projects that require a Direct Digital Control (DDC) fan coil application.*

*You can easily configure point inputs and outputs for control of the fan coil as either a standalone controller or connected to the Metasys® Network through a Network Control Module (NCM), or through the Companion™ System.*



**Figure 1: TC-9102 Fan Coil Controller**

<b>Features and Benefits</b>	
<input type="checkbox"/> <b>HVAC PRO for Windows, Release 6.00</b>	Easy to configure and commission
<input type="checkbox"/> <b>N2 Bus Communication</b>	Facility-wide control efficiencies
<input type="checkbox"/> <b>Compact Size</b>	Ideal for space limited installation
<input type="checkbox"/> <b>On/Off, 3-speed, and Proportional Speed Fan</b>	Maximum comfort and control
<input type="checkbox"/> <b>Internal Relays</b>	No additional relays required for motors up to and including 1/8 hp
<input type="checkbox"/> <b>N2 Opto-Isolation</b>	Minimum electrical noise
<input type="checkbox"/> <b>Wall-mounted Thermostat with Setpoint Dial and Occupancy Button on Cover</b>	User-friendly adjustment

**Standalone Operation or  
Networking Capabilities**

Choices for application needs

# Application

The TC-9102 Terminal Controller is targeted for application specific DDC control similar to the existing UNT and VAV controllers. However, unlike the VAV, heating and cooling can be sequenced from a single output. And, unlike the VAV and UNT, it has 3-speed fan control.

The TC-9102 is the perfect solution for fan coil unit applications and features four different models. The type of model used is determined by the type of fan control and heating/cooling control required. The control functions are HVAC PRO for Windows (Release 6.00) configurable.

The HVAC PRO for Windows (Release 6.00) software sets the control modes. The occupancy sensor input and the occupancy button (on the TM-9100 thermostat) modify the control modes.

A low limit temperature function is a standard feature, which overrides any automatic, time schedule, or manual mode when a low temperature is detected.

When an outdoor temperature is received from a network, the room setpoint will automatically adjust to reduce energy consumption, while maintaining occupancy comfort.

**Table 1: Ordering TC-9102 Models**

Points	Rating	-0221 Fan: On/Off	-0330 Fan: 0 to 10 VDC	-0331 Fan: On/Off	-0332 Fan: 3-Speed
		Heat/Cool: 0 to 10 VDC	Heat/Cool: Incremental*		
<b>Analog Inputs:</b> Zone Temperature Remote Setpoint Fan Override (-0332 only)	32 to 105°F (NTC) 0 to 10K ohms (Potentiometer) 0 to 10K ohms (Potentiometer)	2	2	2	3
<b>Binary Inputs:</b> Window Contact Occupancy Sensor Occupancy Button on Thermostat	<1K ohms <1K ohms <1K ohms	3	3	3	3
<b>Analog Outputs:</b> Heat/Cool (2-proportional) Fan	10 mA at 10 VDC maximum 10 mA at 10 VDC maximum	2	1	0	0
<b>Binary Outputs:</b> Heat/Cool (4-incremental) Fan	0.5 Amperes at 24 VAC 3 Amperes at 120/250 VAC	1	4	5	7

\* 2-stage, PAT, or DAT heating/cooling control options available. Both heating/cooling must use the same option.

# New Sensors

In order to complete your TC-9102 fan coil application, you must order the new TM-9100 thermostat. The TM-9100 has sleek styling with an adjustable dial on the thermostat face for ease of use. It also has Light Emitting Diode (LED) indicators and an occupancy button feature for mode override.

The TM-9100 uses a Negative Temperature Coefficient (NTC) sensor.

The TC-9102 is not compatible with the TE-6400 series thermostat or with the TM-9100 series thermostat.

## Convenient Configuration

Designed for fan coil unit applications, the TC-9102 Controller can be easily configured using the HVAC PRO for Windows software tool. Programs loaded into the TC-9102 are saved in nonvolatile E<sup>2</sup>PROM memory, so there is no need to reload software after a loss of power.

You can load the configuration from a laptop via the N2 Bus. This commissioning allows you to load multiple controllers from one location.

Configuring the TC-9102 is a simple matter of responding to a series of “yes/no” and multiple choice questions, and then specifying setpoints and other parameters.

## Metasys Network Configuration

Your facility benefits even more when the TC-9102 Controller is part of larger Metasys Network. The TC-9102 can connect to the Metasys via the N2 Bus to either a Network Control Unit or Companion System.

When using the network configuration, the TC-9102 may be downloaded via remote access or HVAC PRO for Windows running on a Metasys Operator Workstation.

## Specifications

<b>Supply Voltage</b>	24 VAC, -15% to +10%, 50-60 Hz	
<b>Power Consumption</b>	3 VA Controller and Room Command Module	
<b>Ambient Operating Conditions</b>	32 to 122°F (0 to 50°C) 10 to 90% RH non-condensing	
<b>Ambient Storage Conditions</b>	-40 to 158°F (-40 to 70°C) 10 to 90% RH non-condensing	
<b>Terminations</b>	Terminal block for one 1.5 mm <sup>2</sup> / 16 AWG (maximum) cable and 14 AWG for fan terminal block. Rated for 4 lb-in maximum torque.	
<b>Serial Interfaces</b>	Optically isolated RS-485 interface for N2 Bus connection; 9600 baud	
<b>Controller Addressing</b>	1 to 255 selectable on DIP switches (6) and jumpers (2)	
<b>Mounting</b>	DIN rail or surface (two brackets supplied with controller)	
<b>Housing</b>	Material: ABS + polycarbonate, self-extinguishing UL94 V0 Protection: IP30 (IEC529)	
<b>Dimensions (H x W x D)</b>	4.65 x 4.25 x 1.22 in. (118 x 108 x 31 mm)	Standard Terminals Allow an extra 0.43 in. for Communications terminal.
<b>Shipping Weight</b>	0.66 lb (0.3 kg)	
<b>Inputs</b>	Room Temperature Sensor	NTC Thermistor 32 to 105°F (0 to 40°C)
	Remote Setpoint	10K ohm potentiometer
	3-speed Fan Override	10K ohm potentiometer
	Occupancy Button	Momentary Contact
	Window Contact	Closed (<1K ohm) = window closed
	Occupancy Sensor	Closed (<1K ohm) = occupied
		} Room Command Module TM-9100

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## Specifications (Cont.)

<b>Outputs</b>	<b>Heating/Cooling Control</b>	
	Analog	0 to 10 VDC, maximum 10 mA
	2 DAT	Triacs rated at 24 VAC, maximum 0.5A*
	2 PAT	Triacs rated at 24 VAC, maximum 0.5A*
	2-stage On/Off	Triacs rated at 24 VAC, maximum 0.5A* * Maximum 1 mA leakage current
	PWM	(Europe only) For solenoid valves with Power Driver Module (VA-7400-8950) only.
	<b>Fan Control</b>	
	On/Off	Relay contact rated at 125/250 VAC, maximum 3A maximum 1/8 hp
	3-speed	Relay contact rated at 125/250 VAC, maximum 3A maximum 1/8 hp
	Proportional	0 to 10 VDC, maximum 10 mA
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<b>Standards Compliance</b>	IEEE 446 IEEE 472 IEEE 587 Category A FCC Part 15, Subpart B, Class A UL 916 CSA C22.2 No. 205 (Pending)	
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<b>Agency Listings</b>	UL Listed and CSA Certified as part of the Metasys Network.	
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<b>Accessories</b>	Order separately	
Configuration Tools 1.0 (contains HVAC PRO for Windows 6.00)	WS-WINPRO-0	
HVAC PRO for Windows Cable	AS-CBLPRO-2	
Converter	MM-CVT101-0	
Zone Sensors	TM-9100 Series	
Enclosure Kit	AS-ENC100-0 or EN-EWC10-0 or EN-EWC15-0	
Power Supply	AS-XFR100 or AS-XFR50-1 or Y65XX-X Series	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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**FAN 635**  
Metasys Network Sales Resource Manual  
Printed in U.S.A.