

# TC-3

## User Guide



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# WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Disconnect power supply before making wiring connections or working on this equipment. Follow all applicable safety procedures to prevent accidental power up. Failure to do so can result in injury or death from electrical shock or moving parts and may cause equipment damage.

Improper control adjustments and manual mode control can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before making adjustments.

## ***A Note About Custom Designs***

AbsolutAire often builds equipment with special features as requested by the customer. This manual only covers standard features and does not include any changes made for special feature requests by the customer.



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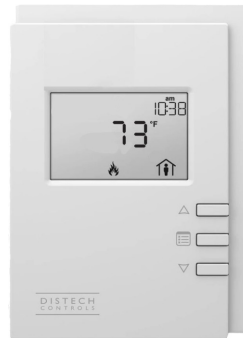
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## ***Introduction***

The Smart-View User Interface (UI) for the TC-3 Control System displays the information necessary to operate and diagnose the Heating and Ventilating Unit.

This is connected to the controller via a CAT-5E cable with a maximum length of 600 feet.



### HMI Screen Information

At the top left corner of the display there is a bell symbol. This is the system alarm indicator. If an alarm is present in the unit this indicator will blink. If no alarm is present this indicator will not be visible.

When navigating the menu, the menu title will be displayed at the top right. Across the center of the display is the data with the units of measure. The system is capable of displaying up to 4 decimal places. In the bottom center is the mode of operation and at the bottom right is the occupancy status.

Three buttons are available for operation (see cover page). The center button allows you to access the menu and scroll through the menu items. The up/down buttons are used to change values.

## ***Operation***

The system will display the current Space Temperature or Discharge Temperature, depending on the control type. The menu is separated into sub-menus for ease of use, and only the options the unit is equipped with will be displayed. When navigating the menu, blinking items are set points that can be changed while non-blinking items are statuses which can be viewed only.



To change set points such as temperature or building pressure, press the “menu” button until you see “SET POINTS” in the top right of the screen. Press the “up arrow” to enter this sub-menu. Your first choice will be “mode”. Use the up arrow to select “heat or vent”. When you have made your choice, press the “menu” button to move to the next menu item, which will be the Occupied Heat Set Point. Again, use the “up/down” arrow buttons to make your entry and press “menu” when finished. Continue scrolling through the Set Points sub-menu until all of your desired settings are completed. When scrolling the menu and you see the option “BACK” in the top right, pressing the “up arrow” will take you to the previous menu.

Scrolling through the “STATUS” sub-menu will allow you to view the status of all of the unit sensors and burner operation. This is useful for checking unit operation or outdoor conditions.

The “ALARMS” menu will only be displayed if there is a system alarm, as indicated by the blinking alarm bell on the display. When an alarm is present, scrolling through this sub-menu will allow you to view the alarm(s) in “plain English” enumerated text. This is useful for diagnosing the unit in the event of a problem.



Sensor Alarm Display



The “CONFIG” menu is where the primary operating set points for the unit are set such as the minimum and maximum allowable discharge temperatures, as well as other items. Again, use the “menu” button to scroll through the sub-menu and the “up/down” buttons to edit your selection.

## ***Schedule***

To set the 7-day occupancy schedule, press the “menu” button until you see “SCHEDULE” in the top right of the display. Press the “up arrow” to enter the schedule. Your first option will be “DAY”. Use the “up/down” arrow to select the day for this schedule. Once you have selected the day, press “menu” to go to the next field which will be the Occupied Hour. This is the hour (I.E. in 24-hour format, 5pm is hour 17) of the day the system will become Occupied. Use the “up/down” arrows to select the appropriate hour, then press “menu” to move to the Occupied Minute. Again, use the “up/down” arrows to select the appropriate minute then press “menu” to move to the Unoccupied Hour and Unoccupied Minute settings. When the occupied and unoccupied hours and minutes have been set for that day, return to “DAY” and use the “up/down” arrows to move to the next day. If you do not want to set a schedule for a certain day, simply leave the hours and minutes at a value of zero (0) and that day will be ignored by the schedule. After you have completed setting the schedule, return to the main display by using the “BACK” options or by not pressing any buttons for 15 seconds.

Once the schedule is set, the unit will follow the occupied and unoccupied temperature set points for each day.



## ***Menu Tree***

### **Main Display**

**Space\_Temp** – Current space temperature at the User Interface (or remote space temperature sensor if equipped).

### **Set Points**

**Heat\_Set\_Point** –Heat Set Point.

### **Status**

**Space\_Temp** – Current space temperature at the User Interface (or remote space temperature sensor if equipped).

**OA\_Temp** – Current outside air temperature.

**RA\_Temp** – Current return air temperature (only if the unit has return air as an option).

**DA\_Temp** – Current discharge air temperature.

**Heat\_Command** – Current command (0% - 100%) issued to the burner for heat.

**Alarms** (alarm menu is only visible if an alarm is present)

**Space\_Sensor** – Space sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

**OA\_Sensor\_Alarm** – Outside sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

**RA\_Sensor\_Alarm** – Return sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring (only available if unit is not 100% outside air).

**DA\_Sensor\_Alarm** – Discharge sensor alarm status. Enumerated “no-fault/open/short”. Check sensor wiring.

**Damper\_Feedback** – OA/RA damper position feedback error. Indicates the processor is not receiving a valid position signal. Check damper wiring.



## **Schedule** (only visible if the unit has scheduling)

**Day** – Schedule day to be programmed.

**Occ\_Hour** – Occupied hour to be programmed. This is the hour (in 24 hour format) that the unit will assume occupied status.

**Occ\_Minute** – Occupied minute to be programmed. This is the minute of the hour the unit will assume occupied status.

**Unocc\_Hour** – Unoccupied hour to be programmed. This is the hour (in 24 hour format) that the unit will assume unoccupied status.

**Unocc\_Minute** – Unoccupied minute to be programmed. This is the minute of the hour the unit will assume unoccupied status.

## **Config**

**Control\_Type** – Determines the type of control the unit will follow. Enumerated “space/discharge”.

**Min\_Discharge** – The units minimum allowable discharge temperature.

**Max\_Discharge** – The units maximum allowable discharge temperature.

**Advanced Menu** (Press and hold “menu” button for 5 seconds to enter)

## **Date Time**

**Year** – Set the real time clock year.

**Date** – Set the real time clock date.

**Time** – Set the real time clock time.





## ***Network Integration***

The controller in this unit can easily be integrated into a BACnet MS/TP Building Management System. The controller will automatically detect the baud rate of the network it is connected to after a power cycle, and will automatically begin communications.

The MAC Address is set via the dip switches on the front of the controller. When shipped, each unit will have a factory default MAC address with multiple units for the same project having incremented MAC addresses. The dip switches are numbered 1 through 8, with 1 being the LSB. The numbering is standard binary format (switches 1 and 3 ON equals an address of 5).

The Network Instance Number (device instance) is automatically configured based on the MAC Address setting. The network instance number will always be  $3640 + (\text{MAC Address})$ . For example, if the MAC address is set to 25 the network instance number would be 364025. In the event of a duplicate instance number on the network, simply change the MAC address to change the instance number.

The following page has a complete listing of the BACnet points with their descriptions.



Point	Name	Description	Writable	Units
Hardware Input 1	Discharge Temperature	HARDWARE INPUT - DO NOT WRITE Discharge Temperature Sensor	N	Unit: degrees-Fahrenheit
Hardware Input 2	Outside Temperature	HARDWARE INPUT - DO NOT WRITE Outside Temperature Sensor	N	Unit: degrees-Fahrenheit
Hardware Input 3	Return Temperature	HARDWARE INPUT - DO NOT WRITE Return Temperature Sensor	N	Unit: degrees-Fahrenheit
Hardware Input 4	SpaceSensor	HARDWARE INPUT - DO NOT WRITE Space Temperature Sensor	N	Unit: degrees-Fahrenheit
Hardware Input 5	DamperFeedback	HARDWARE INPUT - DO NOT WRITE Damper Position Feedback	N	Unit: percent
Hardware Input 6	VoltageTempSetPoint	HARDWARE INPUT - DO NOT WRITE Voltage Temperature Set Point [0 - 10 VDC / 55 - 130 Fahrenheit]	N	
Hardware Output 1	CommonAlarm	HARDWARE OUTPUT - DO NOT WRITE Common Alarm Relay	N	Boolean (TRUE;FALSE)
Hardware Output 2	Unit Enable	HARDWARE OUTPUT - DO NOT WRITE Unit Enable - Open Damper	N	Boolean (On;Off)
Hardware Output 3	Burner Enable	HARDWARE OUTPUT - DO NOT WRITE Burner Enable Output	N	Boolean (On;Off)
Hardware Output 4	Unused_4	Unused	N	
Hardware Output 5	Unused_5	Unused	N	
Hardware Output 6	BurnerCommand	HARDWARE OUTPUT - DO NOT WRITE Burner Output Command [0 - 10 VDC / 0 % - 100%]	N	Unit: percent
Hardware Output 7	OA_RA_DamperPosition	HARDWARE OUTPUT - DO NOT WRITE OA/RA Damper Position [0 - 10 VDC / 0% - 100%]	N	Unit: percent
Hardware Output 8	DischargeTemp	HARDWARE OUTPUT - DO NOT WRITE Voltage Discharge Temperature Output [0 - 10 VDC / -40 - 300 Fahrenheit]	N	Unit: percent
Analog Value 24	SpaceTemperature	Current Space Temperature	N	Unit: degrees-Fahrenheit
Analog Value 25	OutsideTemperature	Current Outside Temperature	N	Unit: degrees-Fahrenheit
Analog Value 26	ReturnTemperature	Current Return Temperature	N	Unit: degrees-Fahrenheit
Analog Value 27	DischargeTemperature	Current Discharge Temperature	N	Unit: degrees-Fahrenheit
Analog Value 30	BurnerOutputCommand	Current Burner Command	N	Unit: percent
Analog Value 82	network_OccHeatSetPoint	Occupied Heat Set Point [55 - 150 Fahrenheit]	Y	Unit: degrees-Fahrenheit
Analog Value 83	network_SpaceTemperature	Network Space Temperature Value [255 for 'null']	Y	Unit: degrees-Fahrenheit
Analog Value 84	network_Occupancy	Network Occupancy Command [0=Occupied/1=Unoccupied/255 uses local schedule]	Y	Unit: degrees-Fahrenheit
Analog Value 85	network_UnoccHeatSetPoint	Unoccupied Heat Set Point [55 - 150 Fahrenheit]	Y	Unit: degrees-Fahrenheit
Analog Value 88	network_MinimumDischarge	Minimum Discharge Temp [default 55 Fahrenheit]	Y	Unit: degrees-Fahrenheit
Analog Value 89	network_MaximumDischarge	Maximum Discharge Temp [default 90 Fahrenheit]	Y	Unit: degrees-Fahrenheit
Binary Value 1	SpaceSensorType	FACTORY CONFIGURATION - DO NOT WRITE [Space Sensor Configuration 0 = HMI / 1 = Remote Wired]	N	Boolean (Remote Wired;HMI)
Binary Value 2	SetPointConfig	FACTORY CONFIGURATION - DO NOT WRITE [Set Point Configuration 0 = HMI / 1 = VDC]	N	Boolean (VDC;HMI)
Binary Value 3	IsSchedAvailable	FACTORY CONFIGURATION - DO NOT WRITE [Is Scheduling Available or Used 0 = No / 1 = Yes]	N	Boolean (YES;NO)
Binary Value 4	UseCO2_Detector	FACTORY CONFIGURATION - DO NOT WRITE [Yes/No]	N	Boolean (YES;NO)
Binary Value 5	UseFanEnable	FACTORY CONFIGURATION - DO NOT WRITE [User network fan enable point 0=NO/1=YES]	N	Boolean (YES;NO)
Binary Value 6	UseBurnerEnable	FACTORY CONFIGURATION - DO NOT WRITE [Use network burner enable point 0=No/1=Yes]	N	Boolean (YES;NO)
Binary Value 44	network_ControlType	Control Type [0 = Discharge / 1 = Space]	Y	Boolean (Space;Discharge)
Binary Value 47	network_UnitEnable	Control Type [0 = Discharge / 1 = Space]	Y	Boolean (On;Off)
Binary Value 48	network_BurnerEnable	Control Type [0 = Discharge / 1 = Space]	Y	Boolean (On;Off)
Multi State Value 1	OA_Percent	FACTORY CONFIGURATION - DO NOT WRITE [Unit Outside Air Percent 1 = 100 / 2 = 20 / 3 = 15]	N	Enum: OA_Percent
Multi State Value 3	DischargeSensorAlarm	Discharge Temp Sensor Alarm [MSV Enumerated]	N	Enum: SensorReliability
Multi State Value 4	SpaceSensorAlarm	Space Temp Sensor Alarm [MSV Enumerated]	N	Enum: SensorReliability
Multi State Value 5	OutsideSensorAlarm	Outside Temp Sensor Alarm [MSV Enumerated]	N	Enum: SensorReliability
Multi State Value 6	ReturnSensorAlarm	Return Temp Sensor Alarm [MSV Enumerated]	N	Enum: SensorReliability
Multi State Value 8	DamperFeedbackAlarm	Damper Feedback Alarm [MSV Enumerated]	N	Enum: SensorReliability

