

TC500 Thermostat Configuration Wizard

USER GUIDE

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ABOUT THIS GUIDE

This document provides instructions to configure the TC500 Thermostat Configuration Wizard connected to the Niagara-N4.10 or higher.

To take full advantage of the information in this guide, users must have training or experience working with the Niagara-N4 software.

PREREQUISITE

Table 1 Prerequisite

Parameter	Description
Software requirement	Niagara-N4.10 or higher.
	Google Chrome web browser
Modules	• honeywellTCThermostatWizard-rt • honeywellTCThermostatWizard-ux The TC500 wizard modules can be downloaded from The Buildings Forum.

INTRODUCTION

The TC500 thermostat configuration wizard is an application that guides you through the process of configuring various operational sequences and settings for the TC500 Thermostat. This wizard configures the TC500 thermostat for conventional and heat pump applications.

It is compatible with Niagara-N4.10 or higher and can be accessed using a workbench or web browser. For more details, refer to the TC500 Thermostat Configuration Wizard Installation Instructions - 31-00489.

Launching the Wizard

Follow the instructions below to launch the TC500 thermostat configuration wizard:

1. Navigate to the TC500 device, click on **Station > Config > Drivers > BacnetNetwork > TC500**.
2. Double-click on TC500 to launch the TC500 Thermostat configuration wizard application.

Field Description

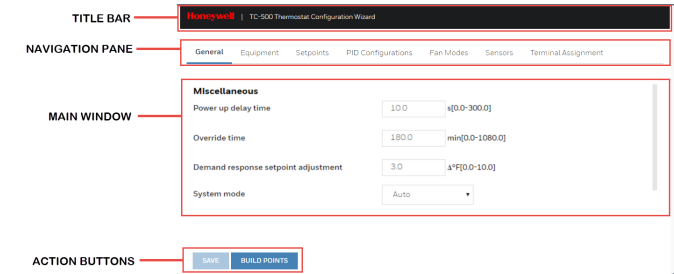


Fig. 1 TC-500 Thermostat Configuration Wizard

TC500 Thermostat Configuration Wizard Application View

Title Bar

Displays the application name as 'TC-500 Thermostat Configuration Wizard'.

Navigation Pane

Enables the user to navigate through the various configurations of the equipment, sensors, PID control, etc. See [“Navigation Tabs” on page 3](#).

Main Window

Provides configuration settings based on the chosen parameters. See [“General” on page 3](#).

Action Buttons

- **SAVE:** Enables the user to save the changes made to a configuration.
- **BUILD POINTS:** Enables the user to build the points in the points folder of the TC500 device.

CONFIGURATION

Navigation Tabs

General

The General tab allows the user to configure the miscellaneous settings for the TC500 Thermostat. See [“General”](#) below.

Equipment

This tab allows the user to select the equipment type and subtypes. Any configuration change will result in generating a unique template number which determines the points to be built when Build Points button is clicked. See [“Equipment”](#) on page 4.

Setpoints

This tab allows the user to configure the setpoints for different modes like occupied, standby, and unoccupied mode. See [“Setpoints”](#) on page 7.

PID Configuration

This tab allows the user to configure the PID parameters for heating and cooling modes. See [“PID Configurations”](#) on page 8.

Fan Modes

This tab allows the user to configure the different fan modes, speed type, and other fan settings. See [“Fan Modes”](#) on page 9.

Sensors

This tab allows the user to configure the different types of sensors present in a system as well as the main control sensor. See [“Sensors”](#) on page 12.

Terminal Assignment

This tab allows the user to configure the different UIs / UIOs / DOs based on the equipment and the other settings. See [“Terminal Assignment”](#) on page 13.

General

General tab allows user to configure Power up delay time, Override time, Demand response setpoint adjustment, and System mode for TC500 device.

Miscellaneous	
Power up delay time	10.0 s[0.0-300.0]
Override time	180.0 min[0.0-1080.0]
Demand response setpoint adjustment	3.0 Δ°F[0.0-10.0]
System mode	Auto

Fig. 2 General tab view

Power up delay time

When the Thermostat is powered on, the fan, heating, and cooling outputs are disabled for a configurable time as set in Power up delay time. The default setting is 10 sec. The fan will start after the power up delay (e.g. 10 sec). The Power up delay time value can range from 0-300 sec.

Override time

This property allows to override and manually set the unoccupied override time in a TC500 device. The default value is 180 mins. The value range is 0-1080 mins.

Demand response setpoint adjustment

This is the demand limit temperature differential setpoint in °F. The value range is 0-10 Δ °F.

System mode

The device supports 16 system modes such as - Auto, Cool, Heat, Emergency heat, Off, and Unconfigured6 to Unconfigured16.

Auto

The system when set to Auto mode can switch over from cooling to heating or heating to cooling mode depending on the space temperature.

The auto change over from cooling to heating mode will be allowed if:

- The space temperature is greater than the effective occupied heat setpoint by 1 °F.
- All the cooling stages are off, the auto changeover will be allowed after a delay of 60 sec.

The auto change over from heating to cooling mode will be allowed if:

- The space temperature is less than the effective occupied cool setpoint by 1 °F.
- All the heating stages are off, the auto changeover will be allowed after a delay of 60 sec.

Cool

During cooling mode, the supply fan will start when there is a call for cooling which will result in enabling mechanical stages of cooling.

Heat

During the heating mode, the supply fan will start when there is a call for heating which will result in enabling mechanical stages of heating.

EmergHeat

An emergency heating override input can be commanded to the system through the wizard. This disables the heat pump compressor and enables the auxiliary heat stages.

Off

When this mode is selected, the value of shutdown from inputs UI1, UI2 or UIO1, UIO2 is on, then the fan is off, the heating and cooling stages are off.

Equipment

This tab allows the user to select the equipment type and subtype. Any change in configuration results in generating a unique app selection number. Click the build points button to generate the points associated with the template number.

Equipment types

Select the required equipment type through this option. It is a primary setting in the configuration as selecting the various other parameters from the different locations depends on the equipment type. The additional settings for the equipment will be enabled or disabled according to the equipment type selected.

The following equipment types are available:

- Conventional
- Air side heat pump
- Water side heat pump

Conventional

A Conventional type of equipment can be set up for cooling or heating as below:

Cooling

Cooling stages

Heating type

Heating stages

2 stages

1 stage

2 stages

3 stages

None

2 stages

None

Modulating

Fig. 3 Conventional equipment type

Cooling stages

When the unit is in the cooling mode, the space temperature PID control loop will be enabled to maintain space temperature setpoints (occupied cool setpoint, standby cool setpoint, and unoccupied cool Setpoint) based on the occupancy schedule.

There are three cooling stages available. The default setting is two stages. On the increase in terminal load from the space temperature control loop, the first stage will duty cycle (or pulse width modulate) based on the load and CPH settings (Cool CPH) to maintain the space temperature at its setpoint. On any further increase in terminal load, the first stage will lock on and the second stage will duty cycle to maintain the space temperature at its setpoint. On any further increase in terminal load, the second stage will lock on and the

third stage will duty cycle to maintain the space temperature at its setpoint and cool stages will come on with a minimum off delay of 60 sec (cool min off time). When terminal load decreases, the reverse sequence will occur, and the cool stage will remain on with a minimum on time delay of 120 sec (cool min on time).

Heating

There are two types of heating available. All heating control elements and heating setpoints are disabled if the heating type is configured as none. Only cooling and off system modes are available. Cooling setpoints are also active.

In staged heating, the total heating stages are three for a conventional type of equipment. The default heating stages is two stages.

- **Staged:** When the unit is in the heating mode and the heating type is configured as staged, the space temperature PID control loop will be enabled to maintain the space temperature setpoints (occupied heat setpoint, standby heat setpoint, and unoccupied heat setpoint) based on the occupancy schedule. On any increase in terminal load from the space temperature control loop, the first stage will duty cycle (or pulse width modulate) based on the load, and CPH settings to maintain the space temperature at its setpoint. On any further increase in terminal load, the first stage will lock on, and the second stage will duty cycle to maintain the space temperature at its setpoint. On any further increase in terminal load, the second stage will lock on, and the third stage will duty cycle to maintain the space temperature at its setpoint, and heat stages will come on with a minimum off delay of 60 sec (heat min off time). When terminal load decreases, the reverse sequence will occur, and the Heat stage will remain on with a minimum on time delay of 120 sec (heat min on time).

Honeywell | TC-500 Thermostat Configuration Wizard

General

Equipment

Setpoints

PID Configurations

Fan Modes

Sensors

Terminal Assignment

Equipment

Equipment type

Cooling stages

Cooling minimum off time

Cooling minimum on time

Cooling cycles per hour

Heating type

Heating stages

Heating minimum off time

Heating minimum on time

Heating cycles per hour

SAVE

BUILD POINTS

Conventional

2 stages

60.0

120.0

3.0

None

2 stages

60.0

120.0

6.0

s[0.0-300.0]

s[0.0-300.0]

[2-20]

Staged

Fig. 4 Heating stages

31-00490-01

4

**NOTE:**

Only two heating stages are allowed for heat pump types of equipment.

- **Modulating:** When the unit is in the heating mode and the heating type is modulating, the space temperature PID control loop will be enabled to maintain space temperature setpoints (occupied heat, standby heat, and unoccupied heat) based on the occupancy schedule. The heating coil will modulate any increase in terminal load from the space temperature control loop to maintain the space temperature at its setpoint.

In modulating heating, the stage 1 heat can be enabled or disabled. The heating demand setpoint is by default 20 %. The user can adjust this value from 0 % to 100 %.

The screenshot shows the 'Equipment' tab of the configuration wizard. The 'Equipment type' is set to 'Conventional'. Under 'Cooling', 'Cooling stages' is set to '2 stages', 'Cooling minimum off time' is 60.0, 'Cooling minimum on time' is 120.0, and 'Cooling cycles per hour' is 3.0. Under 'Heating', 'Heating type' is set to 'Modulating' (selected with a radio button). 'Enable stage 1 heat' is set to 'No' (selected with a radio button). 'Heating demand setpoint' is 20.0. Other heating parameters include 'Heating minimum off time' (60.0), 'Heating minimum on time' (120.0), and 'Heating cycles per hour' (6.0). 'SAVE' and 'BUILD POINTS' buttons are at the bottom.

Fig. 5 Modulating Heating type

Modulating voltage output is available on UI01 or UI02 in the terminal assignment. The user can configure the output terminal as heating control. As the PID control output value varies from 0 to the heating demand setpoint (default 20 %) parameter, the analog output is held at 0 VDC. When the PID control output varies from 20 to 100 %, the analog output will range from 2 to 10 VDC. The value of the analog output is reported to modulating heat network outputs.

Air side heat pump

The user can select the air side heat pump using the equipment type parameter. The heat pump will provide both cold air and hot air to the space based on the demand. Heat transfers in either direction to cool or heat by using air as a heat transfer medium.

The reversing valve can be energized on cool or on heat. Choose between 1-3 stages of the compressor.

Air side heat pump equipment provides various heating types. Select none, staged, or modulating based on the equipment specifications.

The auxiliary heat stages are configured using the auxiliary heating stages parameter. Two auxiliary heating stages are available in staged heating.

The screenshot shows the 'Equipment' tab of the configuration wizard. The 'Equipment type' is set to 'Air side heat pump'. Under 'Cooling', 'Cooling minimum off time' is 60.0, 'Cooling minimum on time' is 120.0, and 'Cooling cycles per hour' is 3.0. 'Energize reversing valve' is set to 'On cool' (selected with a radio button). 'Compressor stages' is set to '2 stages'. Under 'Heating', 'Heating type' is set to 'Staged' (selected with a radio button). 'Auxiliary heating stages' is set to '2 stages'. Other heating parameters include 'Heating minimum off time' (60.0), 'Heating minimum on time' (120.0), and 'Heating cycles per hour' (6.0). Under 'Heat pump settings', 'Compressor lockout' is 30.0, 'Auxiliary heat lockout' is 65.0, 'Auxiliary heat ramp factor' is 2.0, and 'Auxiliary heat droop' is 1.0. 'Comfort mode' is set to 'Saving' (selected with a radio button). 'SAVE' and 'BUILD POINTS' buttons are at the bottom.

Fig. 6 Air side heat pump equipment type with Staged heating

**NOTE:**

The thermostat must be configured with an outdoor sensor before the OAT cooling or heating lockout setpoint is used. Auxiliary heat space temperature setpoint must be set lower than the compressor space setpoint.

If the heat pump is configured, the reversing valve command is automatically assigned to DO4.

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TC-500 Thermostat Configuration Wizard

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Equipment

Equipment type

Air side heat pump

Cooling minimum off time

60.0

s[0.0-300.0]

Cooling minimum on time

120.0

s[0.0-300.0]

Cooling cycles per hour

3.0

[2-20]

Energize reversing valve

☒

On cool

☐

On heat

Compressor stages

2 stages

Heating type

☐

None

☐

Staged

☒

Modulating

Enable stage 1 heat

☐

Yes

☒

No

Heating demand setpoint

20.0

%[0.0-100.0]

Heating minimum off time

60.0

s[0.0-300.0]

Heating minimum on time

120.0

s[0.0-300.0]

Heating cycles per hour

6.0

[2-20]

Heat pump settings

Compressor lockout

30.0

*F[0.0-70.0]

Auxiliary heat lockout

65.0

*F[40.0-120.0]

Auxiliary heat ramp factor

2.0

[1-10]

Auxiliary heat droop

1.0

*F[0.0-10.0]

Comfort mode

☐

Comfort

☒

Saving

SAVE

BUILD POINTS

Fig. 7 Air side heat pump equipment type with Modulating heat

Water side heat pump

When the user selects a water source heat pump using the equipment type parameter, the heat pump would be enabled only when the water flow is proved. Proof of water flow is either established by network input or configured in any universal inputs.

Honeywell

TC-500 Thermostat Configuration Wizard

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Equipment

Equipment type

Water side heat pump

Cooling minimum off time

60.0

s[0.0-300.0]

Cooling minimum on time

120.0

s[0.0-300.0]

Cooling cycles per hour

3.0

[2-20]

Energize reversing valve

☒

On cool

☐

On heat

Compressor stages

2 stages

Heating type

☐

None

☒

Staged

☐

Modulating

Auxiliary heating stages

2 stages

Heating minimum off time

60.0

s[0.0-300.0]

Heating minimum on time

120.0

s[0.0-300.0]

Heating cycles per hour

6.0

[2-20]

Heat pump settings

Compressor lockout

30.0

*F[0.0-70.0]

Auxiliary heat lockout

65.0

*F[40.0-120.0]

Auxiliary heat ramp factor

2.0

[1-10]

Auxiliary heat droop

1.0

*F[0.0-10.0]

Comfort mode

☐

Comfort

☒

Saving

SAVE

BUILD POINTS

Fig. 8 Water side heat pump equipment type with Staged heat

Honeywell

TC-500 Thermostat Configuration Wizard

General

Equipment

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Fan Modes

Sensors

Terminal Assignment

Equipment

Equipment type

Water side heat pump

Cooling minimum off time

60.0

s[0.0-300.0]

Cooling minimum on time

120.0

s[0.0-300.0]

Cooling cycles per hour

3.0

[2-20]

Energize reversing valve

☒

On cool

☐

On heat

Compressor stages

2 stages

Heating type

☐

None

☐

Staged

☒

Modulating

Enable stage 1 heat

☐

Yes

☒

No

Heating demand setpoint

20.0

%[0.0-100.0]

Heating minimum off time

60.0

s[0.0-300.0]

Heating minimum on time

120.0

s[0.0-300.0]

Heating cycles per hour

6.0

[2-20]

Heat pump settings

Compressor lockout

30.0

*F[0.0-70.0]

Auxiliary heat lockout

65.0

*F[40.0-120.0]

Auxiliary heat ramp factor

2.0

[1-10]

Auxiliary heat droop

1.0

*F[0.0-10.0]

Comfort mode

☐

Comfort

☒

Saving

SAVE

BUILD POINTS

Fig. 9 Water side heat pump equipment type with Modulating heat

Setpoints

This tab allows the user to configure the setpoints for different modes like occupied, standby, and unoccupied mode.


TC-500 Thermostat Configuration Wizard

General
Equipment
Setpoints
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Setpoints

Unoccupied heat	55.0	°F[40.0-120.0]
Standby heat	65.0	°F[40.0-120.0]
Occupied heat	68.0	°F[40.0-120.0]
Occupied cool	76.0	°F[40.0-120.0]
Standby cool	80.0	°F[40.0-120.0]
Unoccupied cool	85.0	°F[40.0-120.0]

Setpoint stops

Minimum cooling setpoint	40.0	°F[40.0-120.0]
Maximum heating setpoint	120.0	°F[40.0-120.0]

Setpoint limit

Thermostat deadband	3.0	Δ°F[2.0-9.0]
Temporary setpoint limit	3.0	Δ°F[0.0-5.0]

Cooling setpoint recovery

Maximum cooling setpoint ramp	6.0	Δ°F[0.0-20.0]
Minimum cooling setpoint ramp	2.0	Δ°F[0.0-36.0]
OAT at maximum cooling setpoint ramp	70.0	°F[-40.0-120.0]
OAT at minimum cooling setpoint ramp	90.0	°F[-40.0-120.0]

Heating setpoint recovery

Maximum heating setpoint ramp	8.0	Δ°F[0.0-36.0]
Minimum heating setpoint ramp	2.0	Δ°F[0.0-20.0]
OAT at maximum heating setpoint ramp	60.0	°F[-40.0-120.0]
OAT at minimum heating setpoint ramp	0.0	°F[-40.0-120.0]

Fig. 10 Setpoints

The setpoints entered must be such that:
 unoccupied heat setpoint $\leq$ standby heat setpoint $\leq$
 occupied heat setpoint $<$ occupied cool setpoint $\leq$
 standby cool setpoint $\leq$ unoccupied cool setpoint.



NOTE:

If a setpoint was entered out of range, an error message displays when attempting to save the configuration.

Setpoint stops

The occupied cool setpoint should be greater than the minimum cooling setpoint, and the occupied heat setpoint should be less than the maximum heating setpoint.

Update the values of all the setpoints if the minimum cooling and maximum heating setpoint are adjusted.



NOTE:

Minimum cooling and maximum heating setpoint values added out of range will display an error message while saving the configuration. The configuration range is 40 °F - 120 °F.

Setpoint limit

The difference between occupied cool and occupied heat must be greater than or equal to the thermostat deadband configured. The user should verify the setpoints values if the thermostat deadband parameter is adjusted. The thermostat deadband entered must be valid for the given setpoints.

Thermostat deadband

The thermostat deadband is the temperature differential between the heating and cooling setpoint.



NOTE:

Thermostat deadband values entered out of range will display an error message on saving configuration.

Temporary setpoint limit

The temporary setpoint limit is the amount the occupant can adjust the occupied heating and cooling setpoints.

Cooling setpoint recovery

When a space is transitioning from unoccupied to occupied periods, the effective cool setpoint is gradually ramped from the unoccupied cool setpoint (e.g. 85 °F) to the effective occupied heat setpoint (e.g. 74 °F) over several hours. This allows the unit to recover overtime to avoid bringing on more stages of cooling than necessary.

When no outdoor air temperature is available, the rate at which the setpoint changes is set using the minimum cool ramp rate configuration parameter, and minimum cooling setpoint ramp. The default setting is 2 Δ °F/hr and the allowed range is 0.0 - 36 Δ °F.

Heating setpoint recovery

When the space is transitioning from unoccupied to occupied periods, the effective heat setpoint is gradually increasing from the unoccupied heat setpoint (default of 55 °F) to the effective occupied heat setpoint (default of 70 °F) over several hours. This allows the unit to recover over time to avoid bringing more stages of heat than is necessary.

The rate at which the setpoint changes is set using the heat ramp rate configuration parameter, for example, 2 °F/hr. The heat ramp rate can also be configured to vary based on the outside air temperature.

The heating control will use the setpoint ramp to control the compressor stages as needed to maintain the effective heat setpoint.

PID Configurations

This tab allows the user to configure the PID settings for cooling and heating options.

Honeywell

TC-500 Thermostat Configuration Wizard

GeneralEquipmentSetpointsPID ConfigurationsFan Modes

Cooling options

OAT cooling lockdown setpoint

35.0°F[-40.0-120.0]

DAT cooling low limit

45.0°F[-40.0-120.0]

Throttling range mode

Auto

Manual

Throttling range

4.0>null-null

Integral time

2500.0s[0.0-5000.0]

Derivative time

0.0s[0.0-3000.0]

Heating options

OAT heating lockdown setpoint

65.0°F[-40.0-120.0]

DAT heating high limit

140.0°F[65.0-140.0]

Throttling range mode

Auto

Manual

Throttling range

4.0>null-null

Integral time

2500.0s[0.0-5000.0]

Derivative time

0.0s[0.0-3000.0]

SAVE

BUILD POINTS

Fig. 11 PID Configurations

Cooling options

OAT cooling lockdown setpoint

- When the outside air temperature is below the OAT cooling lockdown setpoint, the cooling control will be disabled.
- When the outside air temperature is above the OAT cooling lockdown setpoint plus a 2 °F differential, the cooling control is enabled.
- When the outside air temperature is invalid or not configured, the cooling lockdown will not affect.

DAT cooling low limit

When the discharge air temperature is below the DAT cooling low limit setpoint, the cooling control will turn off stages of cool until the discharge air temperature rises above its setpoint plus a 2 °F differential.

Throttling range

When the throttling range (TR) is set to a non-zero value, the PID control will use the manually configured throttling range, integral time, and derivative time values.

Throttling range can be calculated as:
 Throttling range (°F) = 2 * number of stages.

- **Integral time:** The value of integral time can be calculated as:
 Integral time = 10000 / Throttling range (°F)
- **Derivative time:** The derivative time can be added as per the required system response. The longer the derivative time is, the stronger the derivative action will be.

When the throttling range is set to auto, the PID gain values will be set as shown in the table below and cannot be edited:

Table 2 Auto Throttling range mode parameter values

Stages	Throttling range	Integral time	Derivative time
None (0)	4	2500	0
1	3	3300	0
2	4	2500	0
3	6	1650	0

Heating options

OAT heating lockout setpoint

- When the outside air temperature is above the configured OAT heating lockout setpoint, the heating control will be disabled.
- When the outside air temperature falls below the configured OAT heating lockout setpoint plus a 2 °F differential, the heating control is enabled.

DAT heating high limit

When the discharge air temperature is above the DAT heating high limit setpoint, the heating control will turn off stages of heat or modulating heat based on heating type configuration until the discharge air temperature falls below its setpoint minus a 2 °F differential. This will help preventing the discharge air temperature from getting too hot and avoid tripping fusible links on fire dampers.

Throttling range

When the throttling range (TR) is set to a non-zero value, the PID control will use the manual configured values for the throttling range, integral time, and derivative time.

Throttling range can be calculated as:
 Throttling range (°F) = 2 * number of stages

- **Integral time:** The value of integral time can be calculated as:
 Integral time = 10000 / Throttling range (°F)

- **Derivative time:** The derivative time can be added as per the required system response. The longer the derivative time is, the stronger the derivative action will be.

When the throttling range is set to Auto, the PID gain values will be set as shown in the [Table 2](#) and cannot be edited.

Fan Modes

The fan modes tab allows the user to set parameters for the fan. The below settings can be changed.

The screenshot shows the 'Fan Modes' configuration page in the Honeywell TC-500 Thermostat Configuration Wizard. The page has a dark header with the Honeywell logo and the title 'TC-500 Thermostat Configuration Wizard'. Below the header is a navigation bar with tabs: General, Equipment, Setpoints, PID Configurations, and Fan Modes (which is currently selected). The main content area is divided into two sections: 'Fan options' and 'Standby'. Under 'Fan options', there is a 'Fan Mode' dropdown menu set to 'Continuous'. Below that are two input fields for 'Fan extended run time in heat' (set to 90.0) and 'Fan extended run time in cool' (set to 0.0), both with a range of s[0.0-300.0]. There is a radio button for 'Enable fan run with heat' which is currently selected, and a radio button for 'Disable'. Below that is a 'Speed type' dropdown menu set to 'Single speed'. Under the 'Standby' section, there is a 'Standby action' radio button set to 'Occupied' and a 'Standby' radio button set to 'Unoccupied'. At the bottom of the page are two buttons: 'SAVE' and 'BUILD POINTS'.

Fig. 12 Fan Modes

Fan Mode

Continuous

When the fan mode is configured as continuous and the unit is in occupied or bypass mode, the supply fan will start and run continuously. When the unit is in the unoccupied or standby mode, the supply fan will operate as described in auto mode.

Auto

During the heating mode, the supply fan will start when there is a call for heating stages. After all heating stages have turned off; the supply fan will stop after a delay of 90 s (default). The supply fan will start when there is a call for heating stages only when enable fan run with heat is set to enable. When enable fan run with heat is disabled, a fan will not start based on heating stages.

During cooling mode, the supply fan will start when there is a call for cooling which results in a mechanical stage of cooling that needs to turn on or when the economizer damper is enabled to be used as the first stage of cooling. After all cooling stages have turned off and the economizer is disabled; the supply fan will stop after a delay of 0 s (default).

FanCirculate

When the unit is in cool / heat mode, if network application mode is commanded to FanOnly mode, then cool / heat mode will be disabled, and the supply fan will run until application mode revert to other modes.

When the space temperature is not valid, and unit is in occupied mode then supply fan will start running continuously until space temperature is valid.

When the unit is in FanOnly mode, all the aux, conv & comp heating / cooling will be disabled & the supply will run as configured in the speed type (single speed, two speed, and variable speed). The fan speed is determined based on the fan speed configured in ventilation mode when in FanOnly mode.

Fan extended run time in heat

In a heating mode of operation, the fan runtime can be extended using this setting. It is by default set to 90 s. The range is from 0-300 s.

Fan extended run time in cool

In the cooling mode of operation, the fan runtime can be extended using this setting. It is by default set to 0 s. The range is from 0-300 s.

Enable fan run with heat

- When enable fan run with heat is set to enable, the supply fan output will turn on when a heat stage turns on and vice versa.
- When Enable fan run with heat is set to disable, the supply fan output will not turn on when a heat stage turns on. An external duct thermostat will turn the fan on when the duct temperature is above its setpoint and will turn the fan off when the duct temperature is below its setpoint.

Speed type

Single speed

When configured for single-speed fan, the settings for fan speeds and operation mode are ignored. The fan starts and stops as required by the controller application.

Two speed

When configured for two-speed fan, the two digital outputs are used, DO1 for a high-speed fan and DO4, DO7, or DO8 for a low-speed fan. When a fan command is off, both relays are off. When a fan is running at high speed (100 %), only the high-speed output (DO1) is energized. When a fan is running at low speed (50 %), only the low-speed output (DO4, DO7, or DO8) is energized.

Table 3 Fan Output at DOs

Fan output	Digital output DO1	Digital outputs DO4 or DO7 or DO8
Off	Not energized	Not energized
High (100 %)	Energized	Not energized
Low (50 %)	Not energized	Energized

Speed type: Two speed

Speed Assignment

Vent mode: speed 1

Cool single stage: speed 1

Cool multi stage: speed 1

Heat single stage: speed 1

Heat multi stage: speed 1

All other modes: speed 1

Standby

Standby action: ☒ Occupied ☐ Unoccupied

SAVE **BUILD POINTS**

Fig. 13 Two speed

Variable speed

When configured for variable speed fan, the fan output DO1 is used to start and stop the fan. An analog output (0 - 10 VDC) is used to vary the fan speed. UIO1 must be configured to use with fan speed control. The fan starts and stops as required by the controller application.

Standby action

When no occupants are present, the unit can be put in a standby mode where the heating and cooling setpoints are lowered or raised. It would use the standby cooling and stand heating setpoints. This can be configured as occupied or unoccupied.



NOTE:

For the fan with a single speed, DO1 is automatically configured. Similarly, for a fan with 2 speed, DO1 is configured as fan high-speed command and DO8 is configured as a fan low-speed command. Fan low-speed command is also available on DO4, DO7 or DO8 and can be configured manually.

When the fan type is configured as a variable speed fan, DO1 is configured for fan command and UIO1 is configured to vary the fan speed.

Honeywell | TC-500 Thermostat Configuration Wizard

General	Equipment	Setpoints	PID Configurations	Fan Modes
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Enable fan run with heat ☒ Enable ☐ Disable

Speed type

Variable speed ▼

Fan speeds

Speed1

100.0

 %[40.0-100.0]

Speed2

100.0

 %[40.0-100.0]

Speed3

100.0

 %[40.0-100.0]

Speed4

100.0

 %[40.0-100.0]

Speed5

100.0

 %[40.0-100.0]

Speed6

100.0

 %[40.0-100.0]

Speed Assignment

Vent mode

speed 1 ▼

Cool single stage

speed 1 ▼

Cool multi stage

speed 1 ▼

Heat single stage

speed 1 ▼

Heat multi stage

speed 1 ▼

All other modes

speed 1 ▼

Standby

Standby action ☒ Occupied ☐ Unoccupied

SAVE **BUILD POINTS**

Fig. 14 Variable speed

Sensors

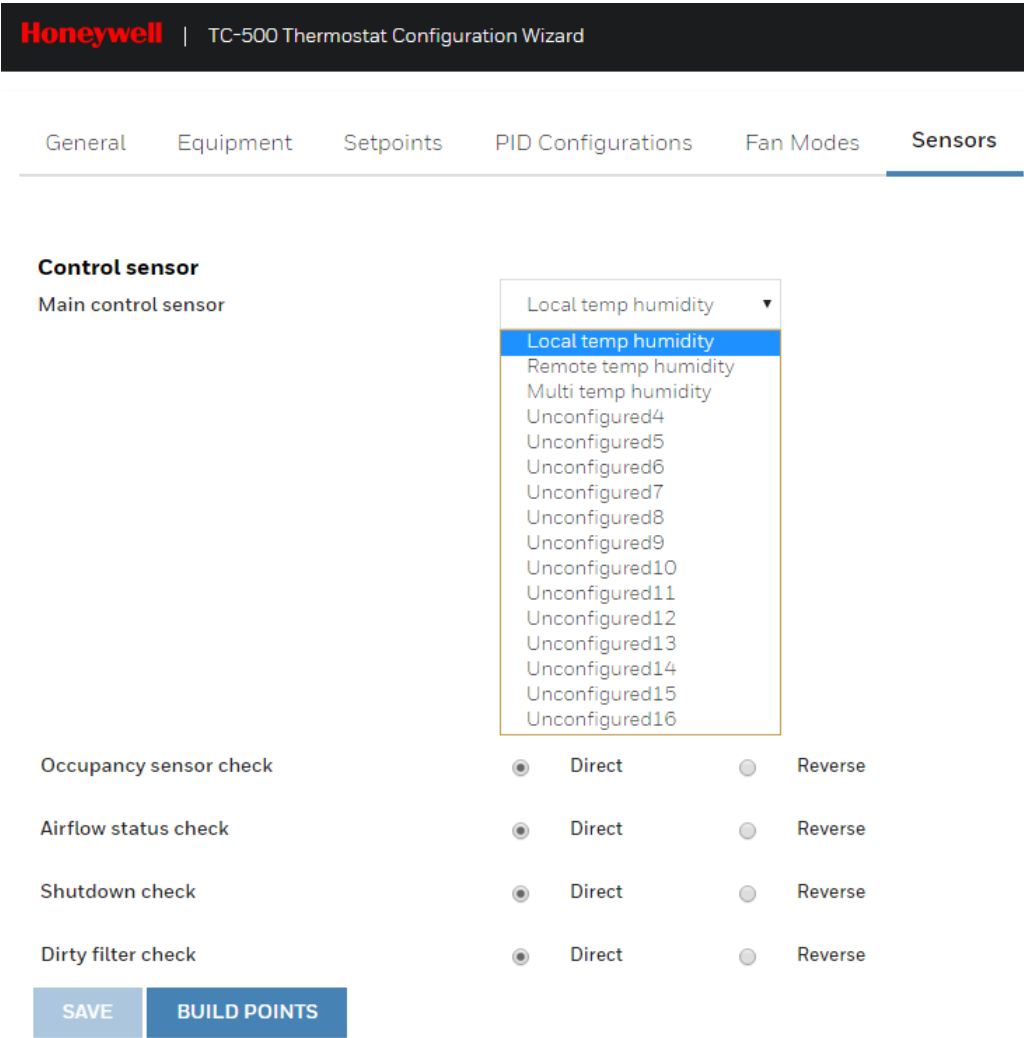


Fig. 15 Sensors

This tab allows the user to configure the sensors.

Main control sensor

The Main control sensor can be configured as:

- **Local temp humidity:** This is an inbuilt thermostat temperature.
- **Remote temp humidity:** This is the temperature sensed by a remotely placed sensor.
- **Multi temp humidity:** This is the temperature sensed by multiple sensors placed at different locations.

Occupancy sensor check

It can be used to save energy by only heating or cooling the space when occupants are present. The occupied heating and cooling setpoints are used when occupants are present.

Airflow status check

The airflow status sensor is a set of external contacts that give feedback when the fan is running. An alarm would be generated when the fan is on (staged or modulating), and there is no input from the airflow status sensor for 10 consecutive seconds.

Shutdown check

When the value of shutdown input from UI1, UI2 or UIO1, UIO2 is on, then the fan is off, heating, and cooling stages are off.

Dirty filter check

A differential pressure switch is installed across the filter. When the differential pressure is above its configured trip point, the contact closes causing the dirty filter check to report the state as a dirty filter on a digital input.

Terminal Assignment

Terminals are assigned according to the user's configuration of the TC500 within the wizard.

Honeywell
TC-500 Thermostat Configuration Wizard

General
Equipment
Setpoints
PID Configurations
Fan Modes
Sensors
Terminal Assignment

DO1	Fan command ▼
DO2	Heating stage1 command ▼
DO3	None ▼
DO4	Heat pump reversing valve command ▼
DO5	Cooling / Compressor stage1 command ▼
DO6	Cooling / Compressor stage2 command ▼
DO7	None ▼
DO8	None ▼
UIO1	None ▼
UIO2	Heating control ▼
UI1	None ▼
UI2	None ▼

SAVE

BUILD POINTS

Fig. 16 Terminal assignment

The options for each of the terminals are given in the table below.

Table 4 Terminal assignment

Terminal	Default	Options
DO1	2 = Fan command	1 = None, 2 = Fan command, 3 = Fan high-speed command
DO2	2 = Heating stage1 command	1 = None, 2 = Heating stage1 command
DO3	2 = Heating stage2 command	1 = None, 2 = Heating stage2 command
DO4	1 = None	1 = None, 2 = Heating stage3 command, 3 = Heat pump reversing valve command, 4 = Fan low-speed command, 5 = Occupancy status, 6 = Dehumidification command, 7 = Humidification command

Table 4 Terminal assignment

Terminal	Default	Options
DO5	2 = Cooling / Compressor stage1 command	1 = None, 2 = Cooling / Compressor stage1 command
DO6	2 = Cooling / Compressor stage2 command	1 = None, 2 = Cooling / Compressor stage2 command
DO7	1 = None	1 = None, 2 = Cooling / Compressor stage3 command, 3 = Economizer min. damper command, 4 = Fan low-speed command, 5 = Occupancy status, 6 = Dehumidification command, 7 = Humidification command
DO8	1 = None	1 = None, 2 = Economizer min. damper command, 3 = Fan low-speed command, 4 = Occupancy status, 5 = Dehumidification command, 6 = Humidification command
UIO1	1 = None	1 = None, 2 = Occupancy sensor, 3 = Dirty filter, 4 = Air flow status, 5 = Shutdown, 6 = Water flow status, 7 = Mixed air sensor, 8 = Outside air sensor, 9 = Discharge air sensor, 10 = CO2 sensor, 11 = Fan speed control, 12 = Space temperature sensor, 13 = Outside air damper control, 14 = Filter pressure, 15 = Compressor current sensor, 16 = Fan current sensor, 17 = Packaged economizer fault, 18 = Window open
UIO2	1 = None	1 = None, 2 = Occupancy sensor, 3 = Dirty filter, 4 = Air flow status, 5 = Shutdown, 6 = Water flow status, 7 = Mixed air sensor, 8 = Outside air sensor, 9 = Discharge air sensor, 10 = CO2 sensor, 11 = Heating control, 12 = Space temperature sensor, 13 = Outside air damper control, 14 = Filter pressure, 15 = Compressor current sensor, 16 = Compressor discharge air temperature, 17 = Packaged economizer fault, 18 = Window open
UI1	1 = None	1 = None, 2 = Occupancy sensor, 3 = Dirty filter, 4 = Air flow status, 5 = Shutdown, 6 = Water flow status, 7 = Mixed air sensor, 8 = Outside air sensor, 9 = Discharge air sensor, 10 = CO2 sensor, 11 = Space temperature sensor, 12 = Filter pressure, 13 = Compressor current sensor, 14 = Fan current sensor, 15 = Compressor discharge air temperature, 16 = Heat pump frequency, 17 = Packaged economizer fault, 18 = Window open
UI2	1 = None	1 = None, 2 = Occupancy sensor, 3 = Dirty filter, 4 = Air flow status, 5 = Shutdown, 6 = Water flow status, 7 = Mixed air sensor, 8 = Outside air sensor, 9 = Discharge air sensor, 10 = CO2 sensor, 11 = Space temperature sensor, 12 = Filter pressure, 13 = Compressor current sensor, 14 = Fan current sensor, 15 = Compressor discharge air temperature, 16 = Heat pump frequency, 17 = Packaged economizer fault, 18 = Window open

UPLOAD/DOWNLOAD CONFIGURATION

The TC500 Thermostat Configuration Wizard allows the user to download and upload the configuration to the TC500 device after configuration changes.

Download Configuration

This action downloads the saved configuration from the wizard to the TC500 device. After every configuration change, it is essential to download the configuration to the device to reflect the new settings. To download the updated configuration to the TC500 thermostat device, right-click on the TC500 device, click **Actions**, and click **Download Configuration**.

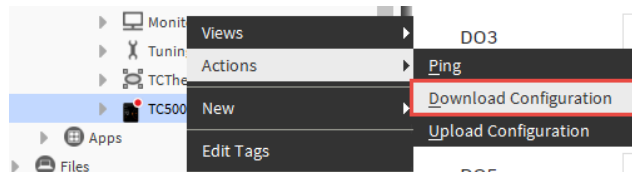


Fig. 17 Download Configuration

Upload Configuration

This action allows the user to upload the configuration that is saved in the TC500 device. After uploading, settings can be reconfigured and downloaded to the device again. To upload the exiting configuration from the TC500 device, click **Actions** and then click **Upload Configuration**.



Fig. 18 Upload Configuration



NOTE:

The upload/download will fail if any point configuration is set to “not configured.”

FIRMWARE DOWNLOAD

1. Expand **Station > Config > Driver**.
2. Right click on the BacnetNetwork > Views > T C Thermostat Bacnet Device Manager.
The list of all available Bacnet devices which are in the database appears.

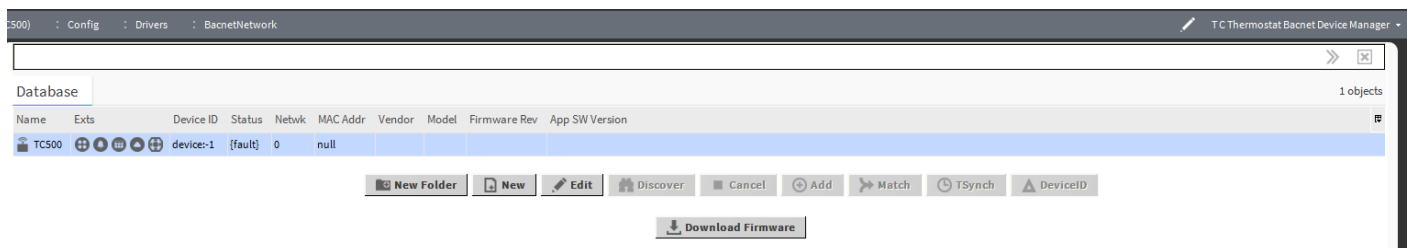


Fig. 19 Firmware Download

3. Select the TC500 thermostat device (Device type = honeywellTCThermostatWizard:TC500).

4. Click on the **Download Firmware** button.
The file chooser window appears.
5. Select the firmware file and click on **Open** button.
The firmware download starts and the user will get a notification after the download process is completed.

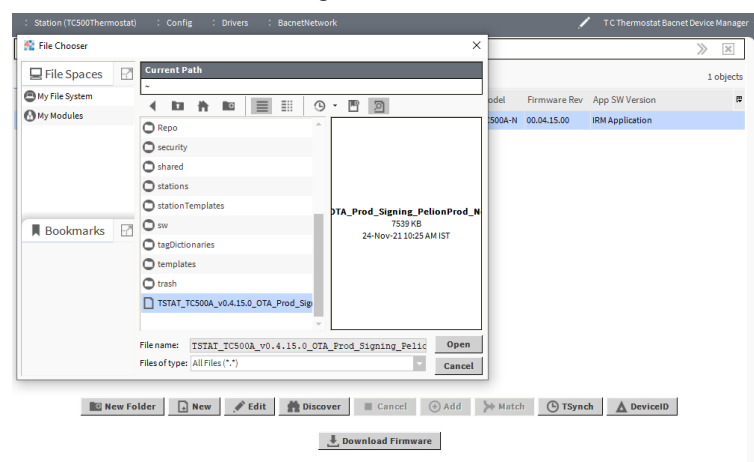


Fig. 20 File Chooser

 **NOTE:**

The firmware download wizard is supported only on the workbench. Refresh the device manager view page when the firmware download is finished to see if the firmware version number has been updated.

APPLICABLE TECHNICAL LITERATURE

Table 5 Applicable Technical Literature

Document Name	Document Number
TC500 Thermostat BACnet Integration Guide	31-00478
TC500 Thermostat Configuration Wizard Installation Guide	31-00489

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