



Tracer™ AH540/541 Air-Handler Controller

LonMark® Datasheet





Overview

The Tracer AH540/AH541 air-handler controller is a cost-effective, direct digital controller in the Tracer controls product family installed on constant-volume and variable-air-volume (VAV) air handlers.

The Tracer AH540/AH541 controller communicates using the LonTalk[®] communications protocol. The controller can be configured to conform to the LonMark[®] Space Comfort Controller (SCC) profile or the Discharge Air Controller (DAC) profile.

See Table 1 on page 3 for a list of the SCC profile standard network variable types (SNVTs) and variables used with the Tracer AH540/541 controller, and see Table 2 on page 5 for a list of the DAC profile SNVTs and variables.

Applications

The Tracer AH540/AH541 controller supports a variety of air-handler configurations including:

- Cooling-only unit
- Heating-only unit
- Heating-only unit with face and bypass
- Cooling and heating unit (coils in either order)
- Heating and cooling unit (coils in this order) with face and bypass for the heating coil
- Heating and cooling unit (coils in this order) with face and bypass for both coils
- Heating cooling changeover (single coil)
- Heating cooling changeover (single coil) with electric heat
- Heating cooling changeover (single coil) with face and bypass heating
- Heating cooling changeover (single coil) with face and bypass heating and electric heat

Heating options

- Hydronic
- Steam
- Electric (staged)

Cooling options

- Hydronic
- DX (up to four stages)

Product models

The Tracer AH540 controller is factory-installed, and the Tracer AH541 is the field-installed version of the controller.

Tracer AH540 controller

The Tracer AH540 is factory-installed on the following Trane air-handler product lines:

- Modular Climate Changer (MCC) air handlers
- T-Series Climate Changer (TSC) air handlers
- Packaged Climate Changer (LPC) air handlers
- AireSystems air handlers
- Industrial Sheet Metal (ISM) custom-made air handlers

A stand-alone or portable operator display can be connected to the Tracer AH540 for completing common tasks and viewing system status.

Reference Trane catalog, CNT-PRC001-EN on the [Trane Web site](#).

Tracer AH541 controller

The Tracer AH541 controller is the field-installed version. The following Tracer AH541 models are available:

- Enclosure with door-mounted operator display
- Enclosure without operator display
- Frame-mounted controller (termination board and circuit board in a plastic frame assembly)

The following operator-display models are available for use with the Tracer AH541:

- Stand-alone operator display
- Portable operator display
- Door-mounted operator display retrofit kit

Reference Trane catalog, BAS-PRC013-EN on the [Trane Web site](#).

Selection of Trane as a single-source provider for air handlers and controls results in superior reliability, consistency, and satisfaction.

Trane open solution

Today's building professionals demand products that enable them to design and install open solutions. In response, Trane offers equipment, controllers, and systems that fully support open protocols. More importantly, Trane offers the system integration knowledge to combine products and services into answers that meet a variety of needs.

As an HVAC leader, Trane knows and understands HVAC equipment. This knowledge and expertise make Trane uniquely qualified to control equipment for the most efficient operation within the building automation system.

Although some applications demand open communication, many building owners find an all Trane system best meets their needs. Trane controls and HVAC components are designed to work together, resulting in easier commissioning and start-up. In ongoing operation, there is a single source available for parts and service. With support for standard industry protocols built in, a total Trane system is still open for auxiliary systems and future building options.

Whether a specific application calls for a single-source supplier or complex system integration, Trane can deliver a solution.

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Space Comfort Controller

Table 1. LonTalk® Space Comfort Controller (SCC) variables

Description	Type	Network variable	SNVT
Airside economizer enable/disable	Binary input	nviEconEnable	SNVT_switch
Airside economizer minimum position	Analog input	nviOAMinPos	SNVT_lev_percent
Airside economizer minimum position (default)	Analog input	nciOAMinPos	SNVT_lev_percent
Alarm message	Analog output	nvoAlarmMessage	SNVT_str_asc
Alarm status	Binary output	nvoStatus nvoUnitStatus alarm	SNVT_obj_status
Application mode	Analog input	nviApplicMode	SNVT_hvac_mode
Cooling output status	Analog output	nvoUnitStatus	SNVT_hvac_status
Effective occupancy	Analog output	nvoEffectOccup nvoOccSchedule	SNVT_occupancy
Emergency override	Analog input	nviEmergOverride	SNVT_hvac_emerg
Energy unit demand (heat/cool)	Analog output	nvoTerminalLoad	SNVT_lev_percent
Entering water temperature	Analog output	nvoEnterWaterTmp	SNVT_temp_p
Face and bypass damper position	Analog output	nvoFBDamper	SNVT_lev_percent
Heating output status	Analog output	nvoUnitStatus	SNVT_hvac_status
Heating output status (secondary heat)	Analog output	nvoUnitStatus	SNVT_hvac_status
Heating/cooling mode	Analog input	nviHeatCool	SNVT_hvac_mode
Heating/cooling mode	Analog output	nvoHeatCool	SNVT_hvac_mode
Mechanical cooling enable/disable	Analog input	nviComprEnable	SNVT_switch
Mechanical heating enable/disable	Analog input	nviAuxHeatEnable	SNVT_switch
Mixed air temperature	Analog output	nvoMixedAirTemp	SNVT_temp_p
Occupancy	Analog input	nviOccSchedule	SNVT_tod_event
Occupancy bypass time	Analog input	nciBypassTime	SNVT_time_min
Occupancy override	Analog input	nviOccManCmd	SnVT_occupancy
Occupancy sensor	Analog input	nviOccSensor	SNVT_occupancy
Outdoor air damper position	Analog output	nvoUnitStatus	SNVT_hvac_status
Outdoor air damper position	Analog output	nvoOADamper	SNVT_lev_percent
Outdoor air temperature	Analog input	nviOutdoorTemp	SNVT_temp_p
Outdoor air temperature	Analog output	nvoOutdoorTemp	SNVT_temp_p
Source temperature	Analog input	nviSourceTemp	SnVT_temp_p
Supply air temperature	Analog output	nvoDischAirTemp	SNVT_temp_p
Supply fan status	Analog output	nvoUnitStatus	SNVT_hvac_status
* Also BACnet compliant			



Table 1. LonTalk® Space Comfort Controller (SCC) variables (continued)

Description	Type	Network variable	SNVT
Time stamp	Analog input	nviTimeSet	SNVT_time_stamp
Time stamp	Analog output	nvoTimeSet	SNVT)Time_stamp
Unit status mode	Analog output	nvoUnitStatus	SNVT_hvac_status
Unocc zone humidity setpoint offset	Analog input	nciUnoccSpRHOfst	SNVT_lev_percent
Unoccupied zone humidity setpoint	Analog input	nciUnoccSpRHStpt	SNVT_lev_percent
Water valve override	Analog input	nviValveOverride	SNVT_hvac_overid
Zone CO2	Analog output	nvoSpaceCO2	SNVT_ppm
Zone occupied humidity setpoint offset	Analog input	nciSpaceRHOffset	SNVT_lev_percent
Zone occupied humidity setpoint	Analog input	nciSpaceRHSetpt	SNVT_lev_percent
Zone relative humidity	Analog input	nviSpaceRH	SNVT_lev_percent
Zone relative humidity	Analog output	nvoSpaceRH	SNVT_lev_percent
Zone temperature	Analog output	nvoSpaceTemp	SNVT_temp_p
Zone temperature*	Analog input	nviSpaceTemp	SNVT_temp_p
Zone temperature (local)	Analog input	nvoLocalSpaceTmp	SNVT_temp_p
Zone temperature setpoint	Analog input	nviSetpoint	SNVT_temp_p
Zone temperature setpoint (active)	Analog output	nvoEffectSetpt	SNVT_temp_p
Zone temperature setpoint (wired input)	Analog output	nvoSetpoint	SNVT_temp_p
Zone temperature setpoint offset	Analog input	nviSetptOffset	SNVT_temp_diff_p
Zone temperature setpoint shift	Analog input	nviSetptShift	SNVT_temp_setpt differential
Zone temperature setpoints (default)	Analog input	nciSetpoints	SNVT_temp_setpt absolute
* Also BACnet compliant			

Discharge Air Controller

Table 2. LonTalk® Discharge Air Controller (DAC) variables

Description	Type	Network variable	SNVT
Airside economizer dry bulb setpoint	Analog input	nciOATSP	SNVT_temp_p
Airside economizer enable/disable	Binary input	nviEconEnable	SNVT_switch
Airside economizer minimum position	Analog input	nviOAMinPos	SNVT_lev_percent
Airside economizer minimum position (default)	Analog input	nciOAMinPos	SNVT_lev_percent
Airside economizer status	Binary output	nvoEconEnabled	SNVT_switch
Alarm message	Analog output	nvoAlarmMessage	SNVT_str_asc
Alarm status	Binary output	nvoStatus	SNVT_obj_status
Application mode	Analog input	nviApplicMode	SNVT_hvac_mode
Application mode	Analog output	nvoApplicMode	SNVT_hvac_mode
Cooling output status	Analog output	nvoUnitStatus	SNVT_hvac_status
Daytime warm up setpoint	Analog input	nciDaytime	SNVT_temp_p
Daytime warm up terminate setpoint	Analog input	nciDaytimeTerm	SNVT_temp_p
Effective occupancy	Analog output	nvoEffectOccup nvoOccSchedule	SNVT_occupancy
Emergency override	Analog input	nviEmergOverride	SNVT_hvac_emerg
Exhaust fan on/off	Binary output	nvoExhFanOnOff	SNVT_switch
Exhaust fan setpoint	Analog input	nciExhStartPos	SNVT_lev_percent
Exhaust fan status	Binary output	nvoExhFanStatus	SNVT_switch
Face and bypass damper position	Analog output	nvoFBDamper	SNVT_lev_percent
Heating output status	Analog output	nvoUnitStatus	SNVT_hvac_status
Heating/cooling mode	Analog output	nvoHeatCool	SNVT_hvac_mode
Mechanical cooling enable/disable	Analog input	nviPriCoolEnable	SNVT_switch
Mechanical heating enable/disable	Analog input	nviPriHeatEnable	SNVT_switch
Mixed air temperature	Analog output	nvoMATemp	SNVT_temp_p
Mixed air temperature low limit setpoint	Analog input	nciMALowLimitSP	SNVT_temp_p
Occupancy	Analog input	nviOccSchedule	SNVT_tod_event
Occupancy bypass time	Analog input	nciBypassTime	SNVT_time_min
Occupancy override	Analog input	nviOccManCmd	SnVT_occupancy
Outdoor air damper position	Analog output	nvoUnitStatus	SNVT_hvac_status
Outdoor air damper position	Analog output	nvoOADamper	SNVT_lev_percent
Outdoor air temperature	Analog input	nviOutdoorTemp	SNVT_temp_p
Outdoor air temperature	Analog output	nvoOutdoorTemp	SNVT_temp_p



Table 2. LonTalk® Discharge Air Controller (DAC) variables (continued)

Description	Type	Network variable	SNVT
Outdoor air temperature (local)	Analog output	nvoLocalOATemp	SNVT_temp_p
Supply air cooling setpoint	Analog input	nviDACISP	SNVT_temp_p
Supply air cooling setpoint (default)	Analog input	nciDACISP	SNVT_temp_p
Supply air cooling setpoint high limit	Analog input	nciMaxDACISP	SNVT_temp_p
Supply air cooling setpoint low limit	Analog input	nciMinDACISP	SNVT_temp_p
Supply air heating setpoint	Analog input	nviDAHtSP	SNVT_temp_p
Supply air heating setpoint (default)	Analog input	nciDAHtSP	SNVT_temp_p
Supply air heating setpoint high limit	Analog input	nciMaxDAHtSP	SNVT_temp_p
Supply air heating setpoint low limit	Analog input	nciMinDAHtSP	SNVT_temp_p
Supply air pressure	Analog input	nviDuctStatPress	SNVT_press_p
Supply air pressure	Analog output	nvoDuctStatPress	SNVT_press_p
Supply air pressure (local)	Analog output	nvoLocalDSPress	SNVT_press_p
Supply air pressure limit	Analog input	nciDuctStatLim	SNVT_press_p
Supply air pressure setpoint	Analog input	nviDuctStaticSP	SNVT_press_p
Supply air pressure setpoint	Analog output	nvoEffDuctStatSP	SNVT_press_p
Supply air pressure setpoint (default)	Analog input	nciDuctStatSP	SNVT_press_p
Supply air pressure setpoint high limit	Analog input	nciMaxDuctStatSP	SNVT_press_p
Supply air pressure setpoint low limit	Analog input	nciMinDuctStatSP	SNVT_press_p
Supply air temperature	Analog output	nvoDischAirTemp	SNVT_temp_p
Supply air temperature setpoint	Analog output	nvoEffDATempSP	SNVT_temp_p
Supply fan status	Analog output	nvoUnitStatus	SNVT_hvac_status
Time stamp	Analog input	nviTimeSet	SNVT_time_stamp
Time stamp	Analog output	nvoTimeSet	SNVT)Time_stamp
Unit status mode	Analog output	nvoUnitStatus	SNVT_hvac_status
Water valve override	Analog input	nviValveOverride	SNVT_hvac_overid
Zone CO2	Analog output	nvoSpaceCO2	SNVT_ppm
Zone relative humidity	Analog output	nvoSpaceRH	SNVT_lev_percent
Zone temperature	Analog input	nviSpaceTemp	SNVT_temp_p
Zone temperature	Analog output	nvoSpaceTemp	SNVT_temp_p
Zone temperature setpoints (default)	Analog input	nciSetpoints	SNVT_temp_setpt absolute



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