

**Honeywell**

# TR100 Wall Module



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## Modbus Integration Guide

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# INTRODUCTION

## 1.1 Scope of the document

The Modbus Integration document contains information related to Modbus Objects and the properties of the TR100 wall module that help engineers to integrate and configure the settings via a Modbus tool.

## 1.2 Reference documents

- TR100 Data sheet - 31-00671-01
- TR100 Installation Instructions - 31-00673
- TR100 User Guide - 31-00674
- TR100 Pocket Guide - 31-00675

## 1.3 Prerequisites

Before going through initial commissioning and configuration process, ensure the TR100 is installed and wired up according to the TR100 installation and mounting guide.

## 1.4 Warning

- To reduce the risk of electrical shock do not open the thermostat. There are no user serviceable parts inside. Refer servicing to qualified service personnel only.
- Cleaning — Use a dry cloth to clean the product. Do not use liquid cleaners or aerosol cleaners.
- Water and moisture — Do not use the product near water. Do not install the product in a place where water may splash onto it.
- Do not operate the thermostat with a hard, sharp, or pointed object such as a fingernail, pen.
- The screen used for the thermostat is made of glass. Therefore, it can break when the product is dropped or heavy impact is applied. Do not handle broken glass without appropriate protection in event of damage.

# SETTING UP AND CONFIGURING MODBUS

## 2.1 Setting Up Modbus Network

Follow these steps for the initial setup of the TR100 Modbus:

- Step 1. Boot-up the TR100 Wall Module. The Honeywell logo screen appears, followed by the Welcome to TR100 screen.



Figure 1. Welcome screen

Step 2. Once the load reaches 100 %, the initial setup screen is shown as below..

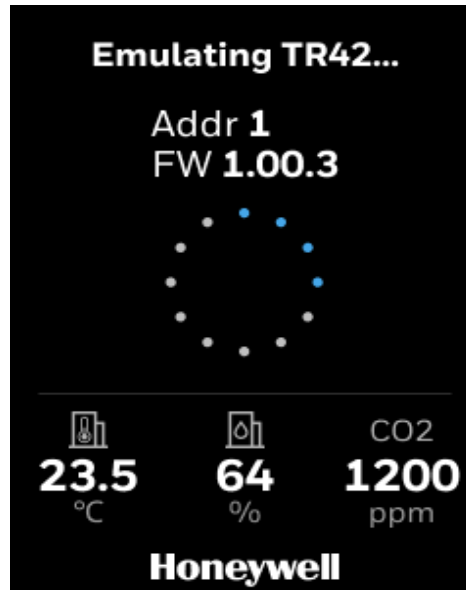


Figure 2. Initial Setup Screen

Step 3. Press and hold the “Honeywell logo” for 5 seconds to access device type selection screen.

Step 4. Select the device type TR100 and click button.

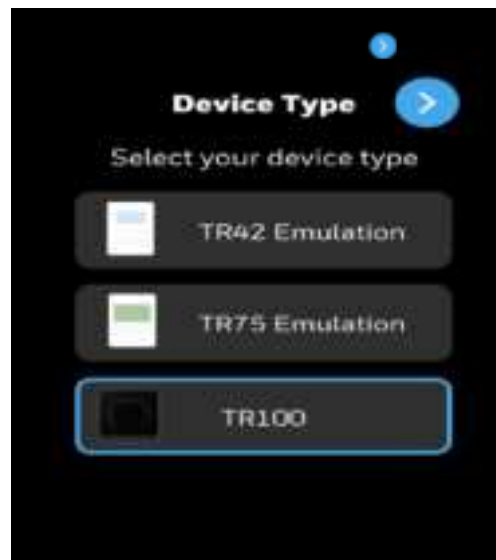


Figure 3. Device Type

Choose Network Connection:.

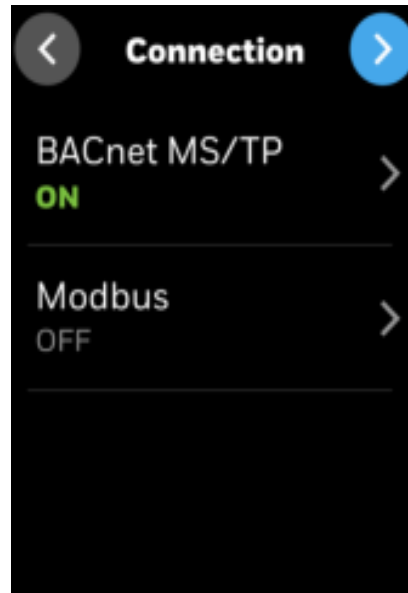


Figure 4. Network Connection

Step 5. Tap Modbus and enable the Modbus connection.

Step 6. To enable Modbus connection swipe the toggle bar to the right. The baud rate shows 'Auto Mode' for the first 5 minutes.

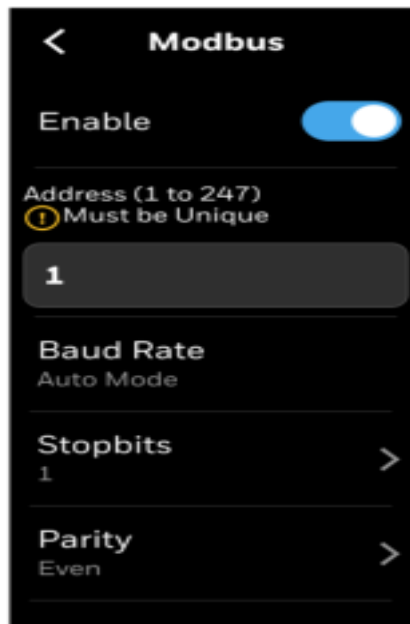


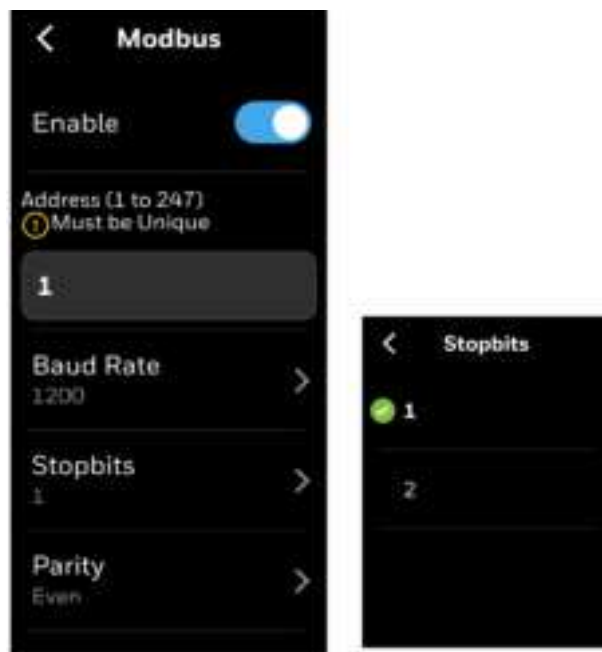
Figure 5. Enable Modbus

Step 7. Select Baud Rate.



Figure 6. Select Baud Rate

Step 8. Select Stopbits .





Step 9. Select Parity.

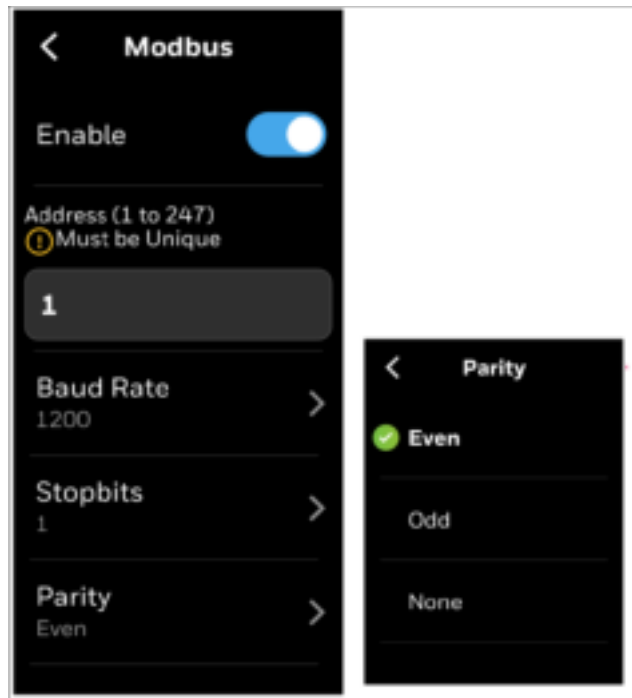


Figure 7. Parity

Step 10. Assign name to device.

Assigning a name to the device:

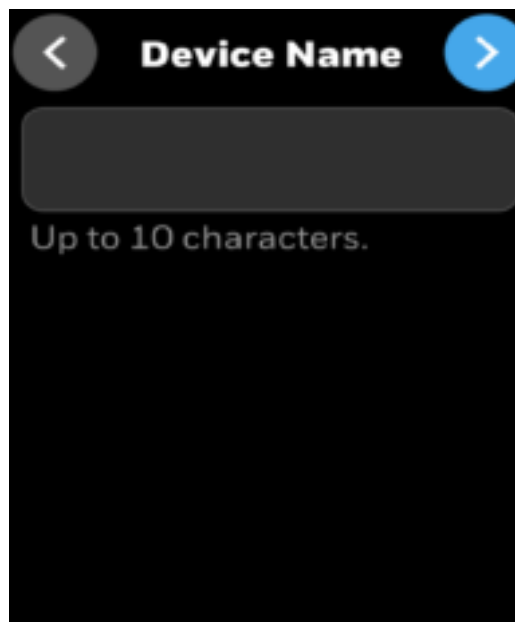


Figure 8. Device Name

- Step 11. Tap on the text field. A keyboard will be displayed on the screen to enter the device name.
- Step 12. Enter the device name. Assign a unique name to a device specifying a name to the location where the device is installed. It assists the user to easily identify the device during remote operation of the device.
- Step 13. After entering a valid device name tap the right arrow button. The device name is saved, and the Passcode screen appears.

## MODBUS OBJECT POINTS

## Alert

Table 1. Alerts

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1954	41955	1	R/W	NV	Cfg_Alarm CO2Upper Limit	ppm	UInt16	400~5000	1	1000	This item is used to configure CO2 upper limit for alarm generation.
HOLDING	1953	41954	1	R/W	NV	Cfg_Alarm HumiUpper Limit	%	UInt16	0-100	1	80	This item is used to configure humidity upper limit for alarm generation.
INPUT	400	30401	1	R	V	no_AlarmInfoFromWallModule		UInt16	BIT0: Alarm - Temperature Sensor Failure (1) BIT1: Alarm - Humidity Sensor Failure (2) BIT2: Alarm - Communication failure (4) BIT3: Alarm - CO2 Upper Limit exceeded (8) BIT4: Alarm - Humidity Upper Limit exceeded (16)	1	0	This alarm information is generated by the wall module itself.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLD-ING	1950	41951	1	R/W	V	ni_AlarmInfoFromController		UInt16	BIT0: Alarm - Window Open (1) BIT1: Alarm - Condensation (2) BIT2: Alarm - Drip Pan (4) BIT3: Alarm - Fan failure (8)	1	0	This alarm information is sent from the controller to the wall module and displayed as an alarm on the wall module.
HOLD-ING	1951	41952	1	R/W	NV	Cfg_AlarmInfoNotifyEnable		UInt16	{BIT0: Alarm - Temperature Sensor Failure (1), BIT1: Alarm - Humidity Sensor Failure (2), BIT2: Alarm - Communication failure (4), BIT3: Alarm - CO2 Upper Limit (8), BIT4: Alarm - Humidity Upper Limit (16), BIT5: Alarm - Window Open (32), BIT6: Alarm - Condensation (64), BIT7: Alarm - Drip Pan (128), BIT8: Alarm - Fan failure(256)}	1	1	<p>This bitmap is used to configure, when each of alarm happen, whether there will be notification banners shown in the home screen.</p> <p>By default, there is only temperature sensor failure will have this notification banner.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLD- ING	1952	41953	1	R/W	NV	Cfg_Alarm HumidityC O2UpperLi mitEnable		UInt16	{BIT0: enable/ disable Humidity upper limit alarm (1), BIT1: enable/ disable CO2 upper limit alarm (2)}	1	0	This bitmap is used to enable/ disable humidity upper and CO2 upper limit alarm. By default, both of humidity upper and CO2 upper limit is disabled For example: set to 1 will enable Humidity limit only; set to 2 will enable CO2 limit only; set to 3 will enable both Humidity and CO2 limits; set to 0 will disable both Humidity and CO2 limits;

## Device

**Table 2. Device:**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	1000	31001	8	R	NV	MODULE_ NAME		String	TR100 -TH-G TR100 -THC- G	1	program med in Factory	TR100-TH-G or TR100-THC-G
INPUT	1008	31009	1	R	NV	Model- Nubmer		UInt 16	0 1	1	program med in Factory	Number 0: represent TR100-TH-G Nubmer 1: represent TR100-THC-G
INPUT	96	30097	2	R	NV	FIRMWAR E_REVISIO N		UInt 32	0~99 for each of byte	1	program med in Factory	For example, 12.34.57.89 This is already designed and implemented in the OTA solution for TR50, unitary controller and Tools we shall keep this.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	1030	31031	8	R	NV	Serial_ Number		String		1	program med in Factory	For example," 0000000000000000 0"
INPUT	80	30081	8	R	NV	TAGIdentifierData		String		1	TR100	TAG Identifier Data, a string constant, "TR100"
HOLD-ING	112	40113	1	R/W	V	TOOLS_HANDLING_COMMAND		UInt 16	0: OTA ready 1: OTA transmit complete 2:Install the NEW firmware via reboot process 3:Cancel OTA, will reboot	1	0	This is used for Honeywell proprietary Firmware Upgrade process happen between Honeywell controller and Wall module

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	114	30115	1	R	V	FIRMWARE_DOWNLOAD_STATUS		UInt16	0: OTA provision OK 1: OTA provision failed 2:firmware update failed 3:firmware update in progress. (After receiving command) 4:reserved. 5:signature validation failed. 6: flash access failed. 9: OTA Provisional status 90:OTA downloading status 91:OTA downloaded status	1	0	This is used for Honeywell proprietary Firmware Upgrade process happen between Honeywell controller and Wall module

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	800	30801	1	R	NV	Last Restart Reason		UInt 16	0: Cold-Start 1: Warm-Start 126: Start-Firmware-Download 130: startdl ssetting sdownload 131: enddls settings download	1	0	Enum for Last Restart Reason
INPUT	801	30802	2	R	V	Time Of Device Restart	sec-ond	UInt 32	0~4294967296 seconds	1	0	Time Of Device Restart The maximum seconds is about 136 years



# Display Values

**Table 3. Display Values**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1550	41551	1	R/W	NV	Cfg_DisplayParamCollection		UInt16	BIT0: AQI Indoor (01) BIT1: AQI Outdoor (02) BIT2: Air Quality (Room CO2) (04) BIT3: Humidity Indoor (08) BIT4: Humidity Outdoor (16) BIT5: Intake Fresh Air (32) BIT6: PM2.5 Indoor (64) BIT7: PM2.5 Outdoor (128) BIT8: PM10 Indoor (256) BIT9: PM10 Outdoor (512) BIT10: TVOC (1024) BIT11: UV Index Outdoor (2048) BIT12: Reserved 1 (4096) BIT13: Reserved 2 (8192)	1	12	It is used to decide which parameter shall be shown on LCD. By default, only humidity indoor and CO2 (if SKU support) will be shown. There are a maximum of 4 parameters that can be shown on the left screen. If the user configures more than 4 bits in this register, only the first four bits corresponding to the parameters will be shown in the order defined from Bit0 to Bit11. If the value is not sent from the controller, the parameter will be displayed as '-'.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1551	41552	1	R/W	V	ni_Aqi-Indoor		UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed.
HOLDING	1552	41553	1	R/W	V	ni_Aqi Outdoor		UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed.
HOLDING	1553	41554	1	R/W	V	ni_Air-Quality(RoomSpaceCO2)	ppm	UInt16	0~5000	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed (but if an on-board sensor is present, on board reading should be shown here)
HOLDING	1554	41555	1	R/W	V	ni_HumidityIndoor	%RH	UInt16	0-100	0.01	327.67	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed (but if an on-board sensor is present, on board reading should be shown here)
HOLDING	1555	41556	1	R/W	V	ni_HumidityOutdoor	%RH	UInt16	0~100	0.01	327.67	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1556	41557	1	R/W	V	ni_In-take-FreshAir	m3/h	UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1557	41558	1	R/W	V	ni_PM2.5Indoor	ug/m <sup>3</sup>	UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1558	41559	1	R/W	V	ni_PM2.5Outdoor	ug/m <sup>3</sup>	UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display for PM2.5.  A raw value of 0x7FFF means the value is not available and should not be displayed.
HOLDING	1559	41560	1	R/W	V	ni_PM1.0Indoor	ug/m <sup>3</sup>	UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1560	41561	1	R/W	V	ni_PM1.0Outdoor	ug/m <sup>3</sup>	UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1561	41562	1	R/W	V	ni_TVOCIndoor	mg/m <sup>3</sup>	UInt16	0~99.9	0.01	327.67	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1562	41563	1	R/W	V	ni_UVIndexOutdoor		UInt16	1-11	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1563	41564	1	R/W	V	ni_DisParaReserved 1		UInt16	0-9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed
HOLDING	1564	41565	1	R/W	V	ni_DisParaReserved 2		UInt16	0~9999	1	32767	This is the value that the master controller can write to the wall module for display.  A raw value of 0x7FFF means the value is not available and should not be displayed

## Fan Control

**Table 4. Fan**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1600	41601	1	R/W	NV	Cfg_Fan Override (User Selected Fan speed from Display)		UInt16	For Stages Fan: 0, 1, 2, 3, 0x7FFF For Variable Speed fan: 0..100% , 0x7FFF 0 = OFF 0x7FFF = Auto	1	32767	This value corresponds to the fan override selected by the room user. The value is sent from the wall module to the controller. However, the value can also be sent by the controller to the wall module to activate and to select a specific fan override. The fan speed selection from the user is saved in the flash and restored after power up of the wall module.  For any staged fan type or variable speed fan, the default user selected fan speed is Auto.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1601	41602	1	R/W	V	ni_Current-Fan speed (Fan Speed Active in Master Controller)		UInt16	For Staged Fan: 0, 1, 2, 3 For Variable speed fan: 0..100% 0 = OFF	1	32767	This value is used to display the current fan speed that the controller is currently controlling. The value is sent from the controller to the wall module.  0x7FFF means Controller doesn't send the Fan speed to wall module yet, so LCD will show User Selected Fan speed instead.
HOLDING	1602	41603	1	R/W	NV	CfgFan-Type (Fan Type)		Enum/UInt16	1: No Fan 2: Single speed Fan 3: Two speed Fan 4: 3-speed Fan 5: Variable SpeedFan	1	1	1: No display of the button and no fan selection. 2: Fan selection: Off, On, Auto 3: Fan selection: Off, Speed 1, Speed 2, Auto 4: Fan selection: Off, Speed 1, Speed 2, Speed 3, Auto 5: Fan selection: 0-100%, Auto (When room user is changed to 0%, it shall be shown as OFF in the middle home screen, but here is no separate OFF fan selection) Note: The fan selection depends also on the User-MinSpeed and Speedometer settings.  If there is a fan type change, the user selected fan speed shall be changed to Auto.
HOLDING	1603	41604	1	R/W	NV	Cfg_VariableSpeedFanAdjustStepSize (variable speed fan adjustment step size)		Enum/UInt16	1: 1% 2: 2% 3: 5% 4: 10% 5: 20%	1	4	Used only for variable speed fan. This is used to set the increment by which the fan should run faster or slower when the fan button is pressed.
HOLDING	1604	41605	1	R/W	NV	Cfg-FanUserMinSpeed (Fan speed low-limit)		UInt16	0, 1, 2, 3 for Staged fan  0..100% for Variable speed fan  999 = No fan override from room user	1	0	The room user cannot select a fan stage or fan level lower than this value from the wall module. Changing this value while a lower stage or level has already been selected by the user will change the user selection.  0 means Off. If Min Speed = 1, then user cannot switch OFF. If Min Speed = 0, then user can switch Off.  999 means that the room user cannot override the fan; the fan selection changes to AUTO and remains on Auto.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1605	41606	1	R/W	NV	Cfg-FanUser - MaxSpeed (Fan speed high limit)		UInt16	0, 1, 2, 3 for Staged fan 0...100% for Variable speed fan 999 = No fan override from room user	1	100	<p>The room user cannot select a fan stage or fan level higher than this value from the wallmodule. Changing this value while a higher stage or level has already been selected by the user will change the user selection.</p> <p>100% means either variable speed fan or any staged fan to allow the maximum fanspeed selection.</p> <p>999 means that the room user cannot override the fan; the fan selection changes to AUTO and remains on Auto.</p>

## General Setting and Monitoring

**Table 5. General setting and Monitoring**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	151	30152	1	R	V	no_-cleaning Mode Status		Enum / UInt16	enum{Not In Cleaning Mode=1, Cleaning Mode=2}	1	1	Shows if the device is in cleaning mode or not

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	150	30151	1	R	V	no_Device faults		UInt16	{BIT0: Reserved, BIT1: Setpoint min/max mismatch, BIT2: Fan Speed min/max mismatch, BIT3: Humidity sensor communication failure, BIT4: Humidity sensor initialize failure, BIT5: CO2 sensor communication failure, BIT6: CO2 sensor initialize failure, BIT7: CO2 sensor selfchecking failure, BIT8: CO2 sensor data not ready, BIT9: both of heat mode and cool mode is set, BIT10: both of heating call and cooling call is active }	1	0	There is no error by default
HOLDING	1650	41651	1	R/W	NV	Cfg_TempDisplayUnit		Enum / UInt16	enum{Degree Celsius=1, Degree Fahrenheit=2}	1	1	All temperature values are displayed in SI-Engineering Units like °C or delta degree C OR in Imperial engineering units like °F or delta degree Fahrenheit.  This affects all displayed temperature values, including room temperature, setpoint, outdoor temperature
HOLDING	1651	41652	1	R/W	NV	Cfg_TempCommUnit		Enum / UInt16	enum{Degree Celsius=1, Degree Fahrenheit=2}	1	1	This unit is just used for temperature value sent from Wall module to the controller
HOLDING	1652	41653	1	R/W	NV	Cfg_CleaningModeTime	seconds	UInt16	10-7200	1	30	Touch screen is clear for this duration in cleaning mode

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1653	41654	1	R/W	V	Cfg_O verrid eReset		UInt16	{BIT0=Reset Setpoint (1), BIT1=Reset Fan Speed To AUTO (2), BIT2=Clear HVAC Mode Override (4), BIT3=Clear Occupancy Override Except Holiday (8), BIT4=Clear Occupancy Override Including Holiday (16), BIT7=Reset Temperature Display Unit To Configured Unit (128), BIT15=Reset WM (32768)}	1	0	<p>This register is used to reset individual, or all overwrites made by the room user.</p> <p>Resetting is carried out every evening over this object, for example, so that everything runs in automatic mode again during the night and the next day. If, for example, someone has overridden the fan to speed 3 and has left the office, the fan should not run at speed 3 all night or all weekend, but the fan overwrite is reset by the controller in the evening, for example at 19:00.</p> <p>If the setpoint was increased by +5°C and the room user goes on vacation for 2 weeks, then the setpoint is also reset to the default value via this point at 19:00, for example. In a hotel application, the entire wall operating unit can be automatically reset via this point when the hotel guest checks out. The object is edge-triggered, which means that it is only reset when the corresponding bit changes from 0 to 1.</p> <p>Bit7 is used if there is the option on the wall module for a room user to switch the displayed unit between °C and °F, which is often possible in hotels. Reset then switches to the configured engineering unit when a guest change-over takes place.</p> <p>Bit15 means Restart of the Wallmodule like after powering up of the wallmodule. In case of a firmware stability problem of the wallmodule firmware, this could be helpful.</p>



Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	200	30201	2	R	V	ModbusBad Frame Count		UInt32		1	0	<p>This is for diagnostic purpose.</p> <p>The count of bad frames received by Modbus since the start of this time, the flash is not saved, it is reset after power cycle or the reset operation is performed through Reg5001.</p>
INPUT	202	30203	2	R	V	ModbusReceivedFrameCount		UInt32		1	0	<p>This is for diagnostic purpose.</p> <p>The count of all frames received by Modbus since the start of this time. The flash is not saved, it is reset after power cycle or the reset operation is performed through Reg5001.</p>
COIL	5001	5002	1	W	V	cfgModbusFrameCntClear		bool		1	0	<p>This is for diagnostic purpose.</p> <p>Used to clear the statistics of the total number of Modbus received packets and the statistics of error packets When write 1, This register value automatically turns to 0 after being written.</p>

## HVAC Mode Control

**Table 6. HVAC**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1700	41701	1	R/W	NV	Cfg_UserSelectedHVAC Mode (from Display)		Enum/ UInt16	enum{Auto=1, Heating=2, Cooling=3, Fanonly=4, Off=5, Heating1=6, Heating 2=7, Cooling 1=8, Cooling 2=9}	1	1	<p>This is the HVAC mode which the user has selected. It is send to the room controller.</p> <p>This HVAC mode value can also be set from controller, but if the value out of available HVAC mode is received by wall module, Value will be ignored.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1701	41702	1	R/W	NV	Cfg_AvailableHVACModes		UInt16	BIT0="AUTO" (1), BIT1="HEAT" (2), BIT2="COOL" (4), BIT3="FAN ONLY" (8), BIT4="OFF" (16), BIT5="HTG1"(32), BIT6="HTG2" (64), BIT7="CLG1" (128), BIT8="CLG2" (256)	1	15	<p>The register defines which HVAC modes the room user can select.</p> <p>Example: If the room user should be able to select between Auto, Heating, Cooling, OFF, then the point value is 1+2+4+16=23.</p> <p>Fan Only means that Cooling over cooling sequences are closed and the fan is started if cooling is required.</p> <p>HTG1 and HTG2 are used if there are 2 different heating units in the room available; one could be regenerative energy.</p> <p>CLG1 and CLG2 are used if there are 2 different cooling units in the room available; one could be regenerative energy.</p> <p>If the value = 0 then the HVAC Mode is not shown and cannot be selected by the room user.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1702	41703	1	R/W	V	ni_Effective-HVACMode_HeatCool-Call(Effective HVAC Mode and heating/cooling call information)		UInt16	BIT0: represent whether effective HVACstatus is available from controller or not (1) BIT1: heat (2) BIT2: cool (4) BIT8: represent whether heating call and cooling call is active information sent from controller or not (256) BIT9: heating call is active (512) BIT10: cooling call is active (1024)	1	0	<p>It is used to indicate the effective HVAC mode and whether heating call or cooling call is active from the controller information.</p> <p>Default value is 0 which means there is no effective HVAC mode, and whether heating or cool call is active either.</p> <p>LED ring is used to represent this information as below.</p> <p>slow breathe orange color: represent heat mode, but there is no heating call</p> <p>fast breathe orange color: represent heat mode, but there is heating call active</p> <p>slow breathe blue color: represent cool mode, but there is no cooling call</p> <p>fast breathe blue color: represent heat mode, but there is cooling call active</p> <p>Before controller send effective HVAC mode and heating/cooling call information, please set BIT0 and BIT8 correctly. For example, Set to 3 (Bit0 + Bit1) to indicate Heat status. Set to 5 (Bit0 + Bit2) to indicate Cool status. Set to 771 (Bit0 + Bit1 + Bit8 + Bit9) to indicate Heating Call is active. Set to 1285 (Bit0 + Bit2 + Bit8 + Bit10) to indicate Cooling Call is active.</p>

# LED\_LCD

**Table 7. LED\_LCD**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1750	41751	1	R/W	NV	Cfg_LCDBacklightBrightness	%	UInt16	20-100	1	80	LCD Back light brightness
HOLDING	1751	41752	1	R/W	NV	Cfg_LEDRingBrightness	%	UInt16	20-80	1	60	LED Ring brightness
HOLDING	1752	41753	1	R/W	NV	Cfg_InactiveDisplayType		Enum/UInt16	enum{Display Off =1, Always On=2, Always Off=3}	1	1	<p>This item is used to configure LCD and LED ring status when LCD is going to inactive mode</p> <p>1. Display Off: only LCD is off, LED ring will show as configured brightness</p> <p>2. Always ON: LCD is in dim status, LED ring will show as configured brightness</p> <p>3. Always off: both of LCD and LED ring will be off.</p>

# Occupancy

**Table 8. Occupancy**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1800	41801	1	R/W	V	ni_OccMdFromSchedAndOccSensor(controller OccupancyMode)		Enum/UInt16	enum{Unknown=1, Occupied(23° 21°C)=2, Off(Building Protection 30° 8°C)=3, Unoccupied(27°C 16°)=5, Standby(25° 18°)=6}	1	1	<p>This comes from master controller (based on schedule and/or occupancy sensor)</p> <p>The controller determines an occupancy mode</p> <p>OccMdFromSchedAndOccSensor mainly from a scheduler (time program), but also taking into account a movement sensor or a key-card system.</p> <p>This OccMdFromSchedAndOccSensor is send over BACnet to the wallmodule. The wallmodule shows the occupancy status with text and / or symbols. Example- Standby from 6am – 7pm (6:00 – 19:00). The controller uses reduced comfort setpoint. Unoccupied from 7:01pm – 5:59am (19:01 – 5:59) or on weekend. This saves energy. Occupied if the motion sensor detects motion during Standby time. If there is invalid value received, it will be rejected at the BACnet protocol level, occupancy status value shall keep the existing one, and ICON is shown accordingly.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1801	41802	1	R/W	V	Cfg_UserSelectedOccupancyMode		Enum/UInt16	No Overwrite=1, occupied=2, off=3, holiday=4, unoccupied=5, standby=6, bypass=7, Do-nothing=255	1	1	<p>Depending on the configuration of the wallmodule, the room user is allowed to overwrite the occupancy mode from the controller (OccMdFromSchedAndOccSensor). For example, if the room user is coming to the office at the weekend, he can change the occupancy mode from Unoccupied to Occupied to get the comfort setpoint on the controller.</p> <p>Normally the controller reads that value, but it is also possible to write this value after a power loss to force the wallmodule to a particular occupancy override mode. If the wallmodule receives 255=DoNothing, then this command is ignored.</p> <p>if value 1= No overwrite is received, and if there is an active overridden status, Wall module shall cancel active override event. otherwise, ignore this command.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1802	41803	1	R/W	NV	Cfg_Allowed overrides from OCC		UInt 16	{BIT0=Unused (1), BIT1=Unused (2), BIT2: Unused (4), BIT3=Allow Override To OFF (8), BIT4=Allow Override To HOLIDAY (16), BIT5=Allow Override To UNOCC (32), BIT6=Allow Override To STANDBY (64), BIT7=Allow Override To BYPASS (128)}	1	160	If OccMdFrom-SchedAndOccSensor is Occupied, then this bitmap configures which override selections the room user may select. If no bit is configured, then the user cannot select any override.  If bit5 = 1 and bit7 = 1, then the room user can select an occupancy override between UNOCCUPIED, BYPASS or NO OVERRIDE. At any time, the room user can cancel the overwrite.
HOLDING	1803	41804	1	R/W	NV	Cfg_Allowed Overrides From OFF		UInt 16	{BIT0=Unused (1), BIT1=Unused (2), BIT2=Allow Override To OCCUPIED (4), BIT3=Unused (8), BIT4=Allow Override To HOLIDAY (16), BIT5=Allow Override To UNOCC (32), BIT6=Allow Override To STANDBY (64), BIT7=Allow Override To BYPASS (128)}	1	128	If OccMdFrom-SchedAndOccSensor is Off, then this bitmap configures which override selections the room user may select. If no bit is configured, then the user cannot select any override.
HOLDING	1804	41805	1	R/W	NV	Cfg_Allowed Overrides From UNOCC		UInt 16	{BIT0=Unused (1), BIT1=Unused (2), BIT2= Allow Override To OCCUPIED (4), BIT3=Allow Override To OFF (8), BIT4=Allow Override To HOLIDAY (16), BIT5=Unused (32), BIT6=Allow Override To STANDBY (64), BIT7=Allow Override To BYPASS (128)}	1	128	If OccMdFrom-SchedAndOccSensor is Unoccupied, then this bitmap configures which override selections the room user may select. If no bit is configured, then the user cannot select any override.  If bit7 = 1, then the room user can select an occupancy override between BYPASS and NO OVERRIDE. At any time, the room user can cancel the overwrite.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLIDING	1805	41806	1	R/W	NV	Cfg_AllowedOverridesFromSTANDBY		UInt16	{BIT0=Unused (1), BIT1=Unused (2), BIT2=Allow Override To OCCUPIED (4), BIT3=Allow Override To OFF (8), BIT4=Allow Override To HOLIDAY (16), BIT5=Allow Override To UNOCC (32), BIT6=Unused (64), BIT7=Allow Override To BYPASS (128)}	1	132	If OccMdFromSchedAndOccSensor is Standby, then this bitmap configures which override selections the room user may select. If no bit is configured, then the user cannot select any override.  If bit2 = 1 and bit7 = 1, then the room user can select an occupancy override between OCCUPIED, BYPASS and NO OVERRIDE. At any time, the room user can cancel the overwrite.



Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1806	41807	1	R/W	NV	Cfg_OccupancyAutoReset		UInt16	{BIT0=A Change To OCC Cancels BYPASS Override (1), BIT1=A Change To STBY Cancels OCC Override (2), BIT2=A Change To UNOCC Cancels OCC Override (4), BIT3=A Change To UNOCC Cancels STBY Override (8), BIT4=A Change To OFF Cancels OCC Override (16), BIT5=A Change To OFF Cancels STBY Override (32), BIT6=A Change To OFF Cancels UNOCC Override (64), BIT7=A Change To Fanspeed Selection OFF Cancels OCC Override (128), BIT8=A Change To Fanspeed Selection OFF Cancels OFF Override (256), BIT9=A Change To Fanspeed selection OFF Cancels UNOCC Override (512), BIT10=A Change To Fanspeed Selection OFF Cancels STBY Override (1024), BIT11=A Change To Fanspeed Selection OFF Cancels BYPASS Override (2048)}	1	4095	<p>Under following conditions, the occupancy override selection is cancelled automatically:</p> <p>If OccMdFrom-SchedAndOccSensor changes to the same occupancy mode as the override mode is, then the user selected occupancy overwrite is cancelled. That means:</p> <ul style="list-style-type: none"> <li>- A change of OccMdFrom-SchedAndOccSensor to OCC cancels the OCC override.</li> <li>- A change of OccMdFrom-SchedAndOccSensor to OFF cancels the OFF override.</li> <li>- A change of OccMdFrom-SchedAndOccSensor to UNOCC cancels UNOCC override.</li> <li>- A change of OccMdFrom-SchedAndOccSensor to STBY cancels the STBY override.</li> </ul> <p>In addition, under the configured conditions, the Occupancy Override mode is also canceled.</p> <p>Also, if the user selects fanspeed overwrite = OFF or 0%, then the Occupancy Override is canceled under the configured conditions.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1807	41808	1	R/W	NV	CfgBypassTimeDefault(Bypass default minutes)	minutes	UInt16	10~1440	1	180	If the user selects an occupancy Override to BYPASS (that means a temporary Occupied mode), then he will be asked how long that BYPASS period should be. This is the default value shown in the display.
HOLDING	1808	41809	1	R/W	NV	CfgBypassTimeMax (Max User Bypass Allowed Time)	minutes	UInt16	30~1440	1	180	If the user selects an occupancy Override to BYPASS (that means a temporary Occupied mode), then he will be asked how long that BYPASS period should be. This is the maximum time which the user can select. Default value = 180min.
HOLDING	1809	41810	1	R/W	V	Cfg_Bypass Timer(Bypass Remaining Minutes)	minutes	UInt16	0~1440	1	0	<p>If the user selects an occupancy Override to BYPASS (that means a temporary Occupied mode), then a timer is started in the wallmodule</p> <p>This datapoint shows the remaining minutes of the BYPASS timer. 0 = Timer is expired / No timer running, then the override to BYPASS is cancelled by the wallmodule.</p> <p>Normally this point is read from the controller but after a power up, the controller can also write this point to a certain value.</p>

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1810	41811	1	R/W	NV	CfgHolidayTime Default(Holiday default days)	days	UInt16	1~45	1	7	If the user selects an occupancy Override to HOLIDAY (that means a temporary OFF mode), then he will be asked how long that HOLIDAY period should be. This is the default value shown in the display.
HOLDING	1811	41812	1	R/W	V	Cfg_HolidayTimer	days	UInt16	0~45	1	0	<p>If the user selects an occupancy Override to HOLIDAY (that means a temporary OFF mode), then a timer is started in the wallmodule.</p> <p>This datapoint shows the remaining days of the HOLIDAY timer. 0 = Timer is expired / No timer running. Then the override to HOLIDAY is cancelled by the wallmodule.</p> <p>Normally this point is read from the controller but after a power up, the controller can also write this point to a certain value.</p>

## Sensor

**Table 9. Sensor**

Reg Type	Reg Address	Abs Addresses	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1850	41851	1	R/W	NV	Cfg_SpaceTempOffset	°C/°F	Int16	-55.5C~55.5, -99.9F~99.9F	0.01	0	Onboard temperature sensor offset.
HOLDING	1851	41852	1	R/W	NV	Cfg_SpaceHumidityOffset	RH%	Int16	-99 ~ 99	0.01	0	Onboard humidity sensor offset.
HOLDING	1852	41853	1	R/W	NV	Cfg_SpaceCO2Offset	ppm	Int16	-999 ~ 999	1	0	Onboard CO2 sensor offset. Only for SKU TR100-THC-G

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
INPUT	300	30301	1	R	V	no_SpaceTempReading	°C/°F	Int16	-68~312°F, -55.5~155.5°C	0.01		Onboard temperature sensor reading.
INPUT	301	30302	1	R	V	no_SpaceHumiReading	RH%	UInt16	0 - 100	0.01		Onboard humidity sensor reading.
INPUT	302	30303	1	R	V	no_SpaceCO2Reading	ppm	UInt16	0~9999	1		Onboard CO2 sensor reading. Only for SKU TR100-THC-G
HOLD-ING	1853	41854	1	R/W	V	ni_DisplayedTempFromController	°C/°F	UInt16	32~212°F, 0~100°C	0.01	32767	Displayed temperature from controller

## Setpoint

**Table 10. Setpoint**

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLD-ING	1900	41901	1	R/W	NV	Cfg Setpoint Type		Enum/ UInt16	enum{No Setpoint=1, Temperature Setpoint Relative=2, Temperature Setpoint Absolute=3}	1	2	Configures which and how the setpoint is shown on the wallmodule.
HOLD-ING	1901	41902	1	R/W	NV	Cfg_Default Setpoint	°C/°F	Int16	For degree C: range is: -100 ~ 100  For degree F: range is -180 ~ 212	0.01	0	CfgSetpDefault is used after the very first power up of the wallmodule or after a reset command;  If CfgSetptType == Temperature Setpt Absolute, then 22 is the default value.  If CfgSetptType == Temperature Setpt Relative, then 0 is the default value.  Default unit is C, this is consistent with default displayed temperature unit.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1902	41903	1	R/W	NV	Cfg_Setpoint minimum	°C/°F	Int16	For degree C: range is: -100 ~ 100  For degree F: range is -180 ~ 212	0.01	-10	The SetptLimited is limited to SetptMin. SetptMax  Default unit is C, this is consistent with default displayed temperature unit.  Controller is given the flexibility and always required to set these appropriate Min and Max values to balance energy efficiency and human comfort.
HOLDING	1903	41904	1	R/W	NV	Cfg_Setpoint maximum	°C/°F	Int16	For degree C: range is: -100 ~ 100  For degree F: range is -180 ~ 212	0.01	10	The SetptLimited is limited to SetptMin. SetptMax  Default unit is C, this is consistent with default displayed temperature unit.  Controller is given the flexibility and always required to set these appropriate Min and Max values to balance energy efficiency and human comfort.
INPUT	350	30351	1	R	V	no_Temperature setpoint limited	°C/°F	Int16	As per setpoint minimum and maximum	0.01	0	The SetptLimited corresponds to the SetptUser value limited by the currently valid minimum and maximum values.

Reg Type	Reg Address	Abs Address	Reg Count	R/W	Memory Type	Point Name	Unit	Data Type	Range	Scale	Default	Description
HOLDING	1904	41905	1	R/W	NV	Cfg_SetptUser (can be modified by controller)	°C/°F	Int16	<p>For degree C: range is: -100 ~ 100</p> <p>For degree F: range is -180 ~ 212</p>	0.01	0	<p>The last setpoint from room user is saved in flash.</p> <p>This value overwrites the setpoint of the wall module. 3276.7 (Hex 7FFF) means that the wall module does nothing. If a new setpoint is written by the controller, a valid value for example +2 is sent, which is then also written unlimited to the flash of the wall module if the value is different from current flash value as a new SetptUser value and then limited and used as SetptLimited.</p> <p>The controller then sends 3276.7 (Hex 7FFF) again which means do nothing in the next send period.</p>

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31-00748-01 Rev. 10-24

