

TBZ500 Z-Wave Plus Specification

Product: TBZ500

Customer: RCS

Date	Doc Rev	Firmware Version	Description
8/28/18	A		1) First Draft – Copied from TBZ48 spec. Z-Wave Plus features added
3/23/19	B	2.03.00	1) Updated spec for Humidity
6/26/19	C	2.03.00	1) Added note for reset. 2) Added RH Config Registers. 3) Corrected ProductTypeID and ProductID

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Overview

The TBZ500 is Z-Wave Plus Thermostat.

Z-Wave® Installation

Z-Wave controllers from various manufacturers support the Z-Wave process of adding or removing a device from a network. The TBZ500 is a Z-Wave Slave and a Z-Wave controller is required as the primary controller to setup and maintain the network.

A Z-Wave® network is a collection of Z-Wave® modules in a mesh type of network. Each Z-Wave® module, regardless of manufacturer, communicates with other modules within range to route and repeat the signals from one device to the next, this creates a highly reliable and robust transmission throughout the home. In addition, the network becomes stronger as more modules are added.

The following procedure will allow the TBZ500 to be included or removed from a Z-Wave network.

Inclusion: Adding the TBZ500 into an Existing Network:

1. **Set your primary controller to Include mode**, to add the TBZ500 as a node on your network (see your controller's user manual for detailed instructions).
2. **Press the FAN button and hold until the screen changes to the SETUP screen.**
3. **Press the UP button until the ZWAVE is shown on the status line, press Select.**
4. **INSTALL should be shown on the status line, press Select.** The status line will show the progress as the TBZ500 has been enrolled into a network. Wait until SUCCESS or FAILED is shown on the status line.
5. **Press Done to exit the ZWAVE screen.**
6. **Press Done again to exit the SETUP screen.** The Radio Icon should be shown indicating the TBZ500 is enrolled into a network.

Your controller will indicate the TBZ500 was successfully added to its network (see your controller's user manual for details). Also you can check if the TBZ500 was successfully added to the network by checking the ZHID (Home ID) and ZNID (Node ID) located in the **INFO** screen. *Inclusion and exclusion are always done at normal transmit power mode.*

If your controller supports NWI, then you can optionally set the primary to NWI include mode. Please note that NWI inclusion mode does not end when you have included a new node. This allows multiple nodes to be included without having to physically go back to the controller to initiate the next inclusion. Therefore, you must manually terminate NWI inclusion mode at the controller when you have finished including any new nodes to the network. Since intermediate included nodes will assist the inclusion process by routing messages, we recommend that nodes close to the primary controller be installed first, proceeding out in consecutive rings from the controller.

Note: Before adding the TBZ500 to a Z-Wave Network, check that it does not already belong to one by viewing the Home and Zone ID's located in the **INFO** screen. An un-configured TBZ500 should show a Node ID of 0 and a random Home ID, and not show the radio icon. Consult your controller's user manual for details on removing a device from a Z-Wave network.

Exclusion: Removing the TBZ500 from a Network:

1. **Set your primary controller to Remove mode**, to remove the TBZ500 as a node on your network (see your controller's user manual for detailed instructions).
2. **Press the FAN button and hold until the screen changes to the SETUP screen.**
3. **Press the UP button until the ZWAVE is shown on the status line, press Select.**
4. **REMOVE should be displayed, press Select.** The status line will show the progress as the TBZ500 has been removed from a network. Wait until SUCCESS or FAILED is shown on the status line.
5. **The controller will indicate the TBZ500 has been removed from the network.** The radio icon will disappear from the screen.

Introduction

This document is for the advanced user who has knowledge of the Z-Wave™ Command Classes and is able to initiate Z-Wave commands programmatically. The TBZ500 can operate as a FLIRS Device. If 24VAC is detected at the time of install the TBZ500 will be installed as a LISTENING node, otherwise it will be a NOT_LISTENING node if battery powered. When the TBZ500 sends a Node Info Report, it reports itself as:

```
GENERIC_TYPE_THERMOSTAT  
SPECIFIC_TYPE_THERMOSTAT_GENERAL_V2
```

In addition to the mandatory command classes, it also supports:

- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_ASSOCIATION_GROUP_INFO
- COMMAND_CLASS_ASSOCIATION_V2
- COMMAND_CLASS_BATTERY
- COMMAND_CLASS_CLOCK
- COMMAND_CLASS_CONFIGURATION
- COMMAND_CLASS_DEVICE_RESET_LOCALLY
- COMMAND_CLASS_FIRMWARE_UPDATE_METADATA_V2
- COMMAND_CLASS_MANUFACTURER_SPECIFIC
- COMMAND_CLASS_MULTI_CMD
- COMMAND_CLASS_MULTILEVEL_SENSOR_V5
- COMMAND_CLASS_POWER_LEVEL
- COMMAND_CLASS_SCENE_ACTIVATION
- COMMAND_CLASS_SCENE_ACTUATOR_CONF
- COMMAND_CLASS_THERMOSTAT_FAN_MODE
- COMMAND_CLASS_THERMOSTAT_FAN_STATE
- COMMAND_CLASS_THERMOSTAT_MODE
- COMMAND_CLASS_THERMOSTAT_OPERATING_STATE
- COMMAND_CLASS_THERMOSTAT_SETPOINT_V2
- COMMAND_CLASS_VERSION_V2

Explorer Frames

The TBZ500 supports Explorer Frames.

Association Alerts

The TBZ500 supports 3 groups and 5 associations per group. See COMMAND_CLASS_ASSOCIATION for more detailed information.

Thermostat Info Screen

The TBZ500 Thermostat Info Screen will display current Z-Wave information including Node ID, Home ID and Z-Wave firmware revision. Also displays the System Type, Changeover Type, Fan Type, Battery Level, and primary firmware version in the info screen.

TBZ500 Menus

The TBZ500 Menu is accessed by holding down the Fan button for 3 seconds.

The Menu items are:

- SETUP - F/C, Backlight Timeout, SensorCal, Away CSP, Away HSP, Status Line
- SYSTEM – System Type, ChangeOver –or- Fan Type, (Hidden Installer Menu)
- ZWAVE – Install, Remove
- CLOCK – Day, Time
- INFO – Model, Version, Zwave Version, Node ID, Home ID, System Type, C/O or Fan Type, Battery Level

TBZ500 Installer Menu

The TBZ500 Installer Menu is accessed by holding down the FAN and DOWN button for 3 seconds when in the main menu.

Factory Reset

Please use this procedure only when the Z-Wave Primary Controller is missing or otherwise inoperable.

To reset the TBZ500's Z-Wave parameters to Factory Settings (both Z-Wave and HVAC settings):

1. Remove power from the TBZ500
2. Hold down the MODE and FAN buttons simultaneously while powering up
3. Release when RESET appears on the Status Line
4. Once the TBZ500 resets the Z-Wave and HVAC settings, a DONE confirmation message will appear on the screen before the thermostat self-reboots.

COMMAND CLASSES

COMMAND_CLASS_BASIC

BASIC_GET

Returns BASIC_REPORT

BASIC_REPORT

returns:

0x00 = Economy Mode (Energy Savings Mode)

0xFF = Comfort Mode (non Energy Savings)

BASIC_SET

0x00 = Economy Mode (Energy Savings Mode) = Away Mode on thermostat

0xFF = Comfort Mode (non Energy Savings) = Run or Hold Mode on thermostat

Basic Set thermostat function

When the thermostat receives a **BASIC_SET OFF (0x00)**:

- Changes from the **current operating mode** (Run or Hold) **to the Energy Savings Mode (Away)**
- Current heating and cooling setpoints will be saved in a temporary memory
- Setpoints will be loaded with the Away setpoints (as set in the Away Mode Setpoints screen)

When the thermostat receives a **BASIC_SET ON (0xFF)**:

- Changes to the Comfort Mode, either Run or Hold, it was in before the Basic Set OFF command was received
- The thermostat reverts to the setpoints that were saved when the Basic Set OFF command was received

COMMAND_CLASS_ZWAVEPLUS_INFO_V2

ZWAVE PLUS INFO REPORT

7	6	5	4	3	2	1	0
COMMAND_CLASS_ZWAVEPLUS_INFO							
ZWAVEPLUS_INFO_REPORT							
Z-Wave Plus Version							
1							
Role Type							
ROLE_TYPE_SLAVE_SLEEPING_LISTENING (installed on battery)							
ROLE_TYPE_SLAVE_ALWAYS_ON (installed on 24VAC)							
Node Type							
NODE_TYPE_ZWAVEPLUS_NODE							
Installer Icon Type MSB							
ICON_TYPE_GENERIC_THERMOSTAT_HVAC (0x12)							
Installer Icon Type LSB							
ICON_TYPE_GENERIC_THERMOSTAT_HVAC (0x00)							
User Icon Type MSB							
ICON_TYPE_GENERIC_THERMOSTAT_HVAC (0x12)							
User Icon Type LSB							
ICON_TYPE_GENERIC_THERMOSTAT_HVAC (0x00)							

COMMAND_DEVICE_RESET_LOCALLY

supported

COMMAND_CLASS_ASSOCIATION_V2

The TBZ500 supports 3 groups and 5 associations per group.

Group 1 Association Alerts are to notify an associated device of a thermostat generated change. Thermostat generated changes are those changes that originate at or by the thermostat. The general classifications of thermostat generated changes are:

- User interface changes – Setpoints, Mode, Fan Mode, Occupied Mode
- Operational changes – Operating State, Fan State (See Configuration parameter #24 for details)
- COMMAND_CLASS_CONFIGURATION changes – See the COMMAND_CLASS_CONFIGURATION table for additional unsolicited alerts
- Setpoint Push – When a setpoint is pushed to maintain the HC-Delta separation
- Battery Status when the battery reaches the predefined Thresholds

Note that Thermostat related Z-Wave commands sent to the TBZ500 will not generate an Alert.

Group 2 Association Alerts will send a BASIC_SET 0xFF when a Cool Call starts and a BASIC_SET 0x00 when the Cool Call ends

Group 3 Association Alerts will send a BASIC_SET 0xFF when a Heat Call starts and a BASIC_SET 0x00 when the Heat Call ends

COMMAND_CLASS_ASSOCIATION_GRP_INFO

Group	Profile	CC & C List	Group Name
1	General:Lifeline	BATTERY_REPORT DEVICE_RESET_LOCALLY_NOTIFICATION SENSOR_MULTILEVEL_REPORT THERMOSTAT_SETPOINT_REPORT THERMOSTAT_SETPOINT_MODE THERMOSTAT_FANMODE_REPORT THERMOSTAT_FANSTATE_REPORT THERMOSTAT_OPERATINGSTATE_REPORT THERMOSTAT_CONFIGURATION_REPORT	Lifeline
2	Control:Key1	BASIC_SET	Cool Control
3	Control:Key2	BASIC_SET	Heat Control

COMMAND_CLASS_MANUFACTURER_SPECIFIC

Send MANUFACTURER_SPECIFIC_GET. The return message will contain the following:

```

MFG ID:
                (0x0010) // RCS

PRODUCTTYPEID1 (0x54) T
PRODUCTTYPEID2 (0x42) B
PRODUCTID1     (0x54) T
PRODUCTID2     (0x39) 9
  
```

COMMAND_CLASS_VERSION_V2

Send VERSION_GET

Application Version is the Z-Wave™ processor code version

Application Sub Version is the application processor code version

COMMAND_CLASS_THERMOSTAT_MODE

THERMOSTAT_MODE_SUPPORTED_GET
returns the support modes, 0x1f and 0x00

THERMOSTAT_MODE_GET
returns the current TBZ500 mode
0 = off
1 = heat
2 = cool
3 = auto
4 = emergency heat

THERMOSTAT_MODE_SET
sets the TBZ500 to the following modes
0 = off
1 = heat
2 = cool
3 = auto
4 = emergency heat

COMMAND_CLASS_THERMOSTAT_SETPOINT_V2

The TBZ500 supports 4 setpoints

THERMOSTAT_SETPOINT_SUPPORTED_GET
Returns THERMOSTAT_SETPOINT_SUPPORTED_REPORT

THERMOSTAT_SETPOINT_SUPPORTED_REPORT

7	6	5	4	3	2	1	0
COMMAND_CLASS_THERMOSTAT_SETPOINT							
THERMOSTAT_SETPOINT_SUPPORTED_REPORT							
0	0	0	0	0	1 (Cool)	1 (Heat)	0
0	0	0	1 Energy Save Cool	1 Energy Save Heat	0	0	0

A THERMOSTAT_SETPOINT_GET using Setpoint Type 1 will return the Heat Setpoint
A THERMOSTAT_SETPOINT_GET using Setpoint Type 2 will return the Cool Setpoint

Receiving a THERMOSTAT_SETPOINT_SET

7	6	5	4	3	2	1	0
COMMAND_CLASS_THERMOSTAT_SEPOINT							
THERMOSTAT_SETPOINT_SET							
0				0x1 for Heat SP (0001) 0x2 for Cool SP (0010) 0xB for AWAY Heat SP (1011) 0xC for AWAY Cool SP (1100)			
0-7 (precision)			Scale 0 for C 1 for F		(size) 1 2 4		
Setpoint Value							
Setpoint Value							
Setpoint Value							
Setpoint Value							

THERMOSTAT_SETPOINT_REPORT format

7	6	5	4	3	2	1	0
COMMAND_CLASS_THERMOSTAT_SEPOINT							
THERMOSTAT_SETPOINT_REPORT							
0				0x1 for Heat SP (0001) 0x2 for Cool SP (0010) 0xB for AWAY Heat SP (1011) 0xC for AWAY Cool SP (1100)			
0-7 (precision)			Scale 0 for C 1 for F		1 (size)		
Setpoint Value							

COMMAND_CLASS_THERMOSTAT_FAN_MODE

THERMOSTAT_FAN_MODE_SUPPORTED_GET

Returns THERMOSTAT_FAN_MODE_SUPPORTED_REPORT

THERMOSTAT_FAN_MODE_SUPPORTED_REPORT

with bitMask1 equal to:

Standard or HeatPump : 0x03

THERMOSTAT_FAN_MODE_SET

valid levels:

0 = Auto

1 = On/Low

THERMOSTAT_FAN_MODE_GET

Returns THERMOSTAT_FAN_MODE_REPORT

THERMOSTAT_FAN_MODE_REPORT

returns levels:

0 = Auto

1 = On

COMMAND_CLASS_THERMOSTAT_FAN_STATE

THERMOSTAT_FAN_STATE_GET

Returns THERMOSTAT_FAN_STATE_REPORT

THERMOSTAT_FAN_STATE_REPORT

Returns the actual state of the TBZ500 fan

0 = Off

1 = On

COMMAND_CLASS_THERMOSTAT_OPERATING_STATE

THERMOSTAT_OPERATING_STATE_GET

Returns THERMOSTAT_OPERATING_STATE_REPORT

THERMOSTAT_OPERATING_STATE_REPORT

OPERATINGSTATE_IDLE = 0

OPERATINGSTATE_HEAT = 1

OPERATINGSTATE_COOL = 2

OPERATINGSTATE_PENDINGHEAT = 4

OPERATINGSTATE_PENDINGCOOL = 5

COMMAND_CLASS_SENSOR_MULTILEVEL_V5

The TBZ500 supports a temperature sensor and humidity sensor accessed through the multilevel sensor command class. The TBZ500 will respond with the default V1 Temperature SENSOR REPORT (scale = F, size = 1) for the following conditions:

- pre-V5 SENSOR_MULTILEVEL_GET
- SENSOR_MULTILEVEL_GET with an unsupported Sensor Type
- Supported Sensor Type with unsupported scale

SENSOR_MULTILEVEL_SUPPORTED_GET_SENSOR:

Returns the SENSOR_MULTILEVEL_SUPPORTED_SENSOR_REPORT

7	6	5	4	3	2	1	0
COMMAND_CLASS_SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_SUPPORTED_SENSOR_REPORT							
0x00 (Reports to follow)							
0	0	0	1 (Humid)	0	0	0	1 (Temp)

SENSOR_MULTILEVEL_SUPPORTED_GET_SCALE:

Returns SENSOR_MULTILEVEL_SUPPORTED_SENSOR_REPORT

7	6	5	4	3	2	1	0
COMMAND_CLASS_SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_SUPPORTED_SCALE_REPORT							
0x01 (Temp Sensor Type)							
0	0	0	0	Scale bit mask 0x03 for C & F			

7	6	5	4	3	2	1	0
COMMAND_CLASS_SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_SUPPORTED_SCALE_REPORT							
0x05 (Humidity Sensor Type)							
0	0	0	0	Scale bit mask 0x01 Percentage value			

SENSOR_MULTILEVEL_GET:

Returns the SENSOR_MULTILEVEL_REPORT

Temperature values can be sent to the TBZ500 using the SENSOR_MULTILEVEL_REPORT command. If the originating NodeID of the SENSOR_MULTILEVEL_REPORT matches one of the Remote Sensor Node numbers, that value will be used as the remote sensor's value.

7	6	5	4	3	2	1	0
COMMAND_CLASS_SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_REPORT							
0x01 (Temperature)							
000 (F precision) 001 (C precision)		Scale 00 (C) 01 (F)			001 (size)		
Temperature Value							

7	6	5	4	3	2	1	0
COMMAND_CLASS_SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_REPORT							
0x05 (Humidity)							
000 (precision)				Scale 00 Percent		001 (size)	
RH Value in percent							

COMMAND_CLASS_CLOCK

CLOCK_GET:

Returns the CLOCK_REPORT

CLOCK_SET:

Sets hour, minute and day of week.

Day 1 = Monday
 Day 2 = Tuesday
 Day 3 = Wednesday
 Day 4 = Thursday
 Day 5 = Friday
 Day 6 = Saturday
 Day 7 = Sunday

COMMAND_CLASS_SCENE_ACTUATOR_CONF

Scenes are mapped to the COMMAND_CLASS_BASIC.

SCENE_ACTUATOR_CONF_SET

Scene ID Range is 1-255
 Scene level is 0x00(setback) or 0xFF(not-setback)

SCENE_ACTUATOR_CONF_GET

Scene ID Range is 1-255
 Returns SCENE_ACTUATOR_CONF_REPORT

SCENE_ACTUATOR_CONF_REPORT

Scene ID Range is 1-255
 Scene level is 0x00(setback) or 0xFF(not-setback)
 Dimming duration is always reported as 0x00

COMMAND_CLASS_SCENE_ACTIVATION

SCENE_ACTIVATION_SET

Scene ID Range is 1-255

COMMAND_CLASS_POWER_LEVEL

POWERLEVEL_SET:

Sets the RF Power Level
0x00=Normal Power
0x01=Minus 1dBm
0x02=Minus 2dBm
0x03=Minus 3dBm
0x04=Minus 4dBm
0x05=Minus 5dBm
0x06=Minus 6dBm
0x07=Minus 7dBm
0x08=Minus 8dBm
0x09=Minus 9dBm

POWERLEVEL_GET:

Returns the POWER_LEVEL_REPORT

POWERLEVEL_TEST_NODE_SET:

Instructs the destination node to transmit a number of test frames to the specified node with the RF power level specified.

POWERLEVEL_TEST_NODE_GET:

Returns the result of the latest Powerlevel Test Node Set Command effectuated.

COMMAND_CLASS_MULTI_CMD

The MULTI_CMD command class allows the TBZ500 to send multiple Z-Wave commands in one packet. This allows the TBZ500 to send/receive update commands quickly, using less battery power.

MULTI_CMD_ENCAP

This command encapsulates multiple standard commands in one packet. In general there is no menu item for this command class on a Z-Wave controller. This command class is used as a background function behind the other command classes.

COMMAND_CLASS_BATTERY V1

BATTERY_GET
BATTERY_REPORT

COMMAND_CLASS_FIRMWARE_UPDATE_MD V2

The Firmware update command class allows updating firmware in both the MSP430 micro and Z-Wave micro.

The firmware OTA process will only work if the battery capacity is > 50%.

Refer to the TBZ500 Z-Wave Over the Air Update Spec for details.

COMMAND_CLASS_CONFIGURATION

There are configuration parameters accessible via the COMMAND_CLASS_CONFIGURATION.

Note all temperature related parameters are in degrees F.

Sample commands:

To check unit System Type, send CONFIGURATION_GET, 1. Return is a 0 for Standard or 1 for HP.

To check C/F Mode, send CONFIGURATION_GET, 7. Return is a 0 for C or 1 for F.

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
1	System Type ⁴	1	N	0	0 = Standard 1 = Heat Pump	0 = Standard 1 = Heat Pump
2	Fan Type ⁴	1	N	0	0 = Gas (No fan w/Heat) 1 = Electric (Fan w/Heat)	0 = Gas (No fan w/Heat), 1 = Electric (Fan w/Heat)
3	Change Over Type ⁴	1	N	0	0 = CO w/cool 1 = CO w/heat	0 = CO w/cool 1 = CO w/heat
4	2 nd Stage Heat Enable ⁴	1	N	0	0 = Disabled 1 = Enabled	0 = Disabled 1 = Enabled
5	Aux Heat Enable ⁴	1	N	1	0 = Disabled 1 = Enabled	0 = Disabled 1 = Enabled
6	2 nd Stage Cool Enable ⁴	1	N	0	0 = Disabled 1 = Enabled	0 = Disabled 1 = Enabled
7	C/F Type	1	N	1	0 = Centigrade 1 = Fahrenheit	0 = Centigrade 1 = Fahrenheit
8	MOT ⁵	1	N	5	5-9	5-9
9	MRT ⁵	1	N	3	3-9	3-9
10	Setpoint H/C Delta	1	N	3	3-15	3-15
11	H Delta Stage 1 ON	1	N	1	1-6	1-6
12	H Delta Stage 1 OFF	1	N	0	0-5	0-5
13	H Delta Stage 2 ON	1	N	2	2-7	2-7
14	H Delta Stage 2 OFF	1	N	0	0-6	0-6
15	H Delta Aux ON	1	N	3	3-8	3-8
16	H Delta Aux OFF	1	N	0	0-7	0-7
17	C Delta Stage 1 ON	1	N	1	1-6	1-6

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
18	C Delta Stage 1 OFF	1	N	0	0-5	0-5
19	C Delta Stage 2 ON	1	N	2	2-7	2-7
20	C Delta Stage 2 OFF	1	N	0	0-6	0-6
21 0x15	Mechanical Status ³	2	Y		MECH_H1 0x0001 MECH_H2 0x0002 MECH_H3 0x0004 MECH_C1 0x0008 MECH_C2 0x0010 PHANTOM_F 0x0020 MECH_F 0x0040 MANUAL_F 0x0080 reserved 0x0100	n/a
22 0x16	SCP Status ³	1	Y		STATE_HEAT 0x01 STATE_COOL 0x02 STATE_2ND 0x04 STATE_3RD 0x08 STATE_FAN 0x10 STATE_LAST 0x20 STATE_MOT 0x40 STATE_MRT 0x80	n/a
23 0x17	Autosend Enable Bits When set, the corresponding report is sent out unsolicited when a changed is detected, to the nodes in the association list	2	N	0x205F	TEMPERATURE (CC_SENSOR_MULTILEVEL) 0x0001 SETPOINTH (CC_THERMOSTAT_SETPOINT) 0x0002 SETPOINTC (CC_THERMOSTAT_SETPOINT) 0x0004 MODE (CC_THERMOSTAT_MODE) 0x0008 FANMODE (CC_THERMOSTAT_FAN_MODE) 0x0010 FANSTATE (CC_THERMOSTAT_FAN_STATE) 0x0020 OPERATINGSTATE (CC_THERMOSTAT_OPERATING_STATE) 0x0040 SCHEDENABLE (CC_CONFIGURATION #38) 0x0080 SETBACK (CC_CONFIGURATION #40) 0x0100 RUNHOLD (CC_CONFIGURATION #39) 0x0200 DISPLAYLOCK (CC_CONFIGURATION #24) 0x0400 0x0800 0x1000 BATTERY ⁶ (CC_BATTERY) 0x2000 MECH STATUS (CC_CONFIGURATION #21) 0x4000 SCP STATUS (CC_CONFIGURATION #22) 0x8000	
24	Display Lock ³	1	Y	0	0 = unlocked	0 = unlocked

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
					1 =locked	1 = locked
26	Backlight Timer	1	N	20	10-30	10-30
33	Max Heat Setpoint	1	N	90	30F – 109F	30F – 109F
34	Min Cool Setpoint	1	N	60	33F – 112F	33F – 112F
38	Schedule Enable	1	N	0	0 = Disabled 1 = Enabled	0 = Disabled 1 = Enabled
40	Setback Mode ³	1	Y	0	0 = No Setback 2 = UnOccupied Mode	0 = No Setback 2 = UnOccupied Mode
41	Un-Occupied HSP ¹	1	N	62	30F - 109F	30F - 109F
42	Un-Occupied CSP ¹	1	N	80	33F – 112F	33F – 112F
43	Remote Sensor 1 Node Number	1	N	0	0-252 0= Disabled	0-252 0= Disabled
46	Remote Sensor 1 Temperature	1	N	0		n/a
48	Internal Sensor Temp Offset	1	N	0	-7 to 7	-7 to 7
49	R1 Sensor Temp Offset	1	N	0	-7 to 7	-7 to 7
52	Filter Timer (hours)	2	N	0	0-4000+	0-4000
53	Filter Timer Max (hours)	2	N	300	0-4000	0-4000
54	Heat Timer (hours)	2	N	0	0-4000+	0-4000
55	Cool Timer (hours)	2	N	0	0-4000+	0-4000
61	Fan Purge Heat	1	N	0	0-90	0-90
62	Fan Purge Cool	1	N	0	0-90	0-90
170 0xaa	Send Association Autosend with ACKs	1	N	1	0 = Send with no ACK request 1 = Send with ACK request	0 = Send with no ACK request 1 = Send with ACK request
171 0xab	Number of Heat Call Starts	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
172 0xac	Number of Cool Call Starts	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
173 0xad	Reboot Count	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
174 0xae	CPU runtime (sec) (battery mode only)	4	N	0	0-0x7FFFFFFF	n/a
175 0xaf	Autosend Wakeup count	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
176 0xb0	UI Wakeup count	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
177	Reserved					
178 0xb2	Power Status Bits are set according to power setup.	1			POWER_BATTERY 0x01 POWER_24VAC 0x02 PWR_ACINSTALL 0x10 PWR_BATINSTALL 0x20 PWR_FLIRS 0x40	n/a
179 0xB3	Battery Bank Voltage (%)	1	N		0-100	n/a
181 0xB5	Battery (%) Stat Shutdown threshold	1		0	0-50	0-50
182 0xB6	Battery (%) Radio Cutoff threshold	1		10	10-50	10-50
183 0xB7	Battery (%) LOWBATT Indicator threshold	1		20	20-75	20-75
184 0xB8	Battery (%) Threshold value for Midlevel	1		50	50-80	50-80
185 0xB9	Battery Report Timer (days)	1	N	1	0 = Disabled, 1 – 10	0 = Disabled, 1 – 10
186 0xBA	Temperature Delta Autosend Threshold (how many degree change from the last autosend)	1	N	2	1-5 (degrees)	1-5 (degrees)
187 0xBB	Periodic Temperature Send Interval (min)	1	N	0	0 = Disabled, 1 – 120	0 = Disabled, 1 – 120
188	reserved					
189	reserved					
190	reserved					
194 0xC2	RH Delta Autosend Threshold (how many percent change from the last autosend)	1	N	5	1-50 (percent)	1-50 (percent)
195 0xC3	Periodic RH Send Interval (min)	1	N	0	0 = Disabled, 1 – 120	0 = Disabled, 1 – 120
196	Reserved					
198	Reserved	4	N		n/a	

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
221	Runtime-Stage1 Heat (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
222	Runtime-Stage2 Heat (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
223	Runtime-Aux Heat (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
224	Runtime-Stage1 Cool (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
225	Runtime-Stage2 Cool (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
226	Runtime-Fan Only (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
227	Runtime-Standby (sec)	4	N	0	0-0x7FFFFFFF	0-0x7FFFFFFF
230	reserved					
231	Status Display(0 displays RH on status line, 1 displays setpoints)	1	N	1	0,1	0,1

¹ Setting the AWAY setpoints via the CONFIG command class does not maintain the delta-T separation

²

³ Config Parameters can be selectively Enabled to be Sent Unsolicited by setting the appropriate bits in the AutoSend Config Register #23

⁴ Any change to a Mechanical System setting may cause the current HVAC operation to abort and start an MOT

⁵ An MOT/MRT change will not take effect until the next MOT or MRT cycle

⁶ The battery alert enable only applies to the periodic battery report (config reg 185) and not the built in battery threshold alerts (config regs 183, 184)

⁷ Schedule Enable (#38) must be enabled prior to setting this parameter