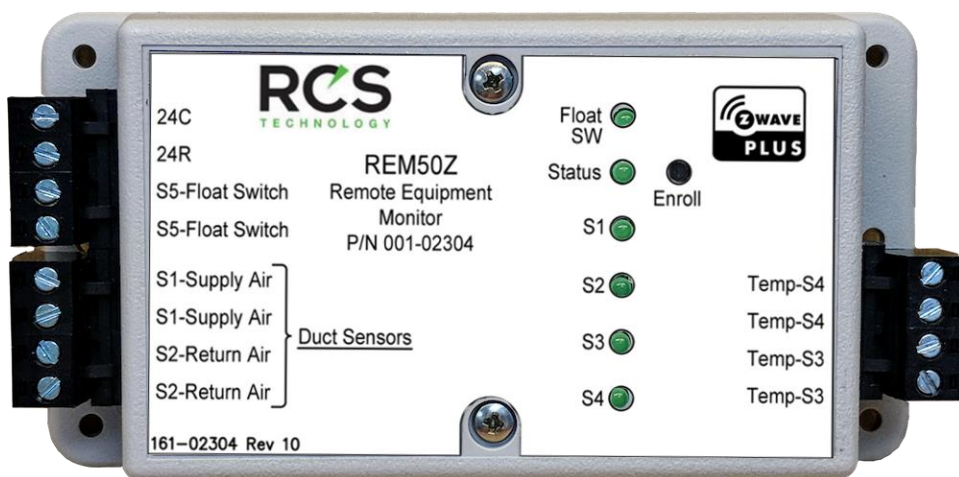




REM50Z

Installation & User's Manual



DCN: 141-02304 Rev 01

6/20/18

RCS Technology, Inc
12860 Danielson Ct Suite A
Poway, CA 92064
USA
Phone: +1 858-486-2331

© RCS Technology, Inc. All rights reserved

INTRODUCTION

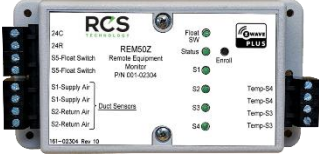
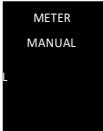
This manual contains installation and setup steps, as well as general use and troubleshooting information. Please keep it on file for future reference.

This manual contains important instructions that should be followed during installation and maintenance of the RCS Resource Meter. This manual must be read and understood prior to installing the system.

Refer to the REM50Z Z-Wave Specification for specific Z-Wave details.

INCLUDED COMPONENTS

Here’s a list of the components included, the tools required, as well as items that are not included.

(1x) REM50Z 	User & Install Manual 
---	---

Not Included

- Wire and related hardware for connecting power
- 120V AC 15-amp breaker for REM50Z power

Tools Required

- Small flat head screwdriver
- Drill or medium size Phillips head screwdriver
- Wire cutter and wire stripper
- Z-Wave Network Enrollment Device

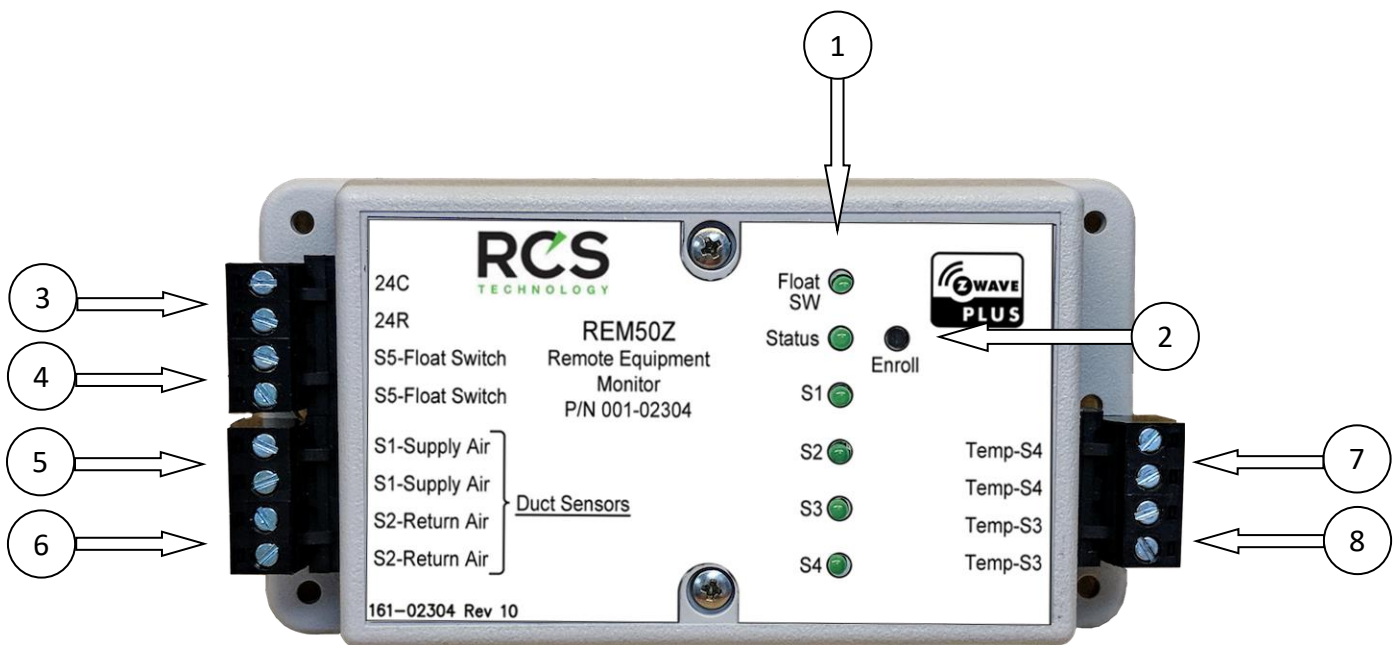
SYSTEM SPECIFICATIONS

	REM50Z
Electrical & Communication	
Power Requirements	16 – 28 VAC or 12 – 24 VDC
Measurement Range	Range : 5.0F – 160.0F (-15.0C – 71.0C)
Communication	Z-Wave
Thermistor Type	10K Type-A curve TYPE 2 or 3 selectable
Environmental	
Operating Environment	Suitable for dry locations
Operating Temperature	-20 to 70 C
Enclosure Rating	IPX-0 (This device is not protected against the ingress of water)
Mechanical	
Dimensions	5.09 x 2.65 x 1.10 inches

[illegible]

REM50Z Unit - Label

- 1 Status LEDs
- 2 Install Button
- 3 AC or DC input
- 4 Float Switch Input
- 5 Temperature Sensor 1 Input
- 6 Temperature Sensor 2 Input
- 7 Temperature Sensor 3 Input
- 8 Temperature Sensor 4 Input



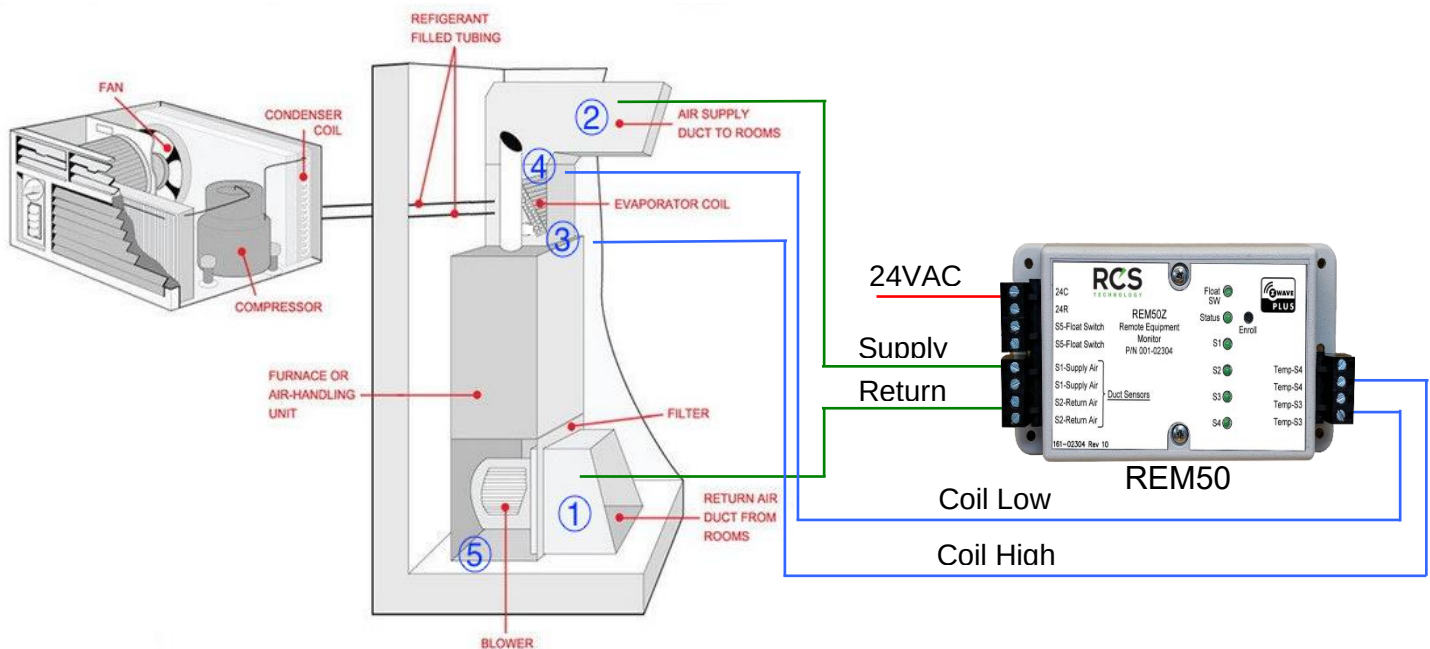
INSTALLATION

Protect the REM50Z from moisture, direct sunlight, high temperatures, and conductive pollution (salt spray, metal dust, etc.) The REM50Z may be installed in any orientation, directly to a wall of an electrical panel or junction box. The REM50Z may be used as a template to mark mounting hole positions, but do not drill the holes with the REM50Z in the mounting position because the drill bit or chuck may damage the REM50Z housing or connectors.

STEP 1: Wire Sensor Probes

Follow Wiring Diagram 1 to connect the sensor wires to the REM50Z.

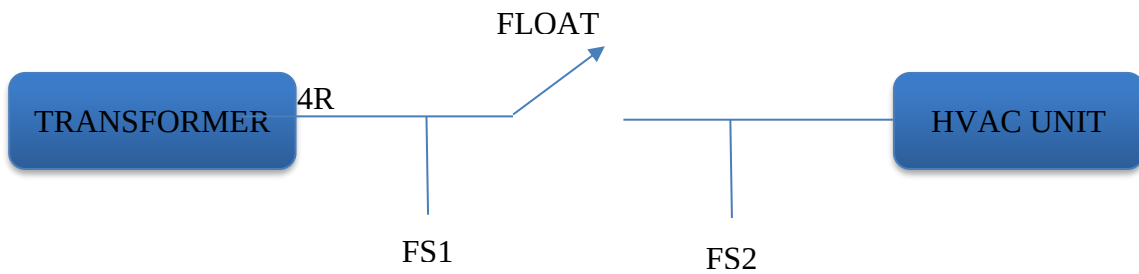
Wiring Diagram 1



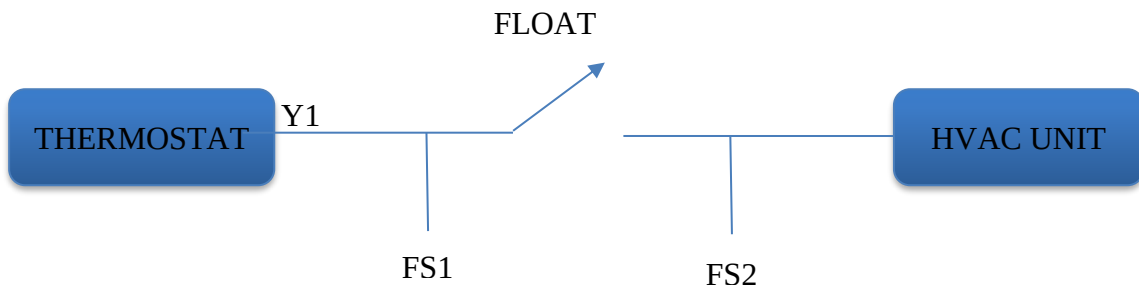
STEP 2: Wire Float Sensor

The float sensor inputs, FS1 and FS2, must be wired to each side of the float sensor in one of the following setups:

1. With the float sensor on the 24R line:



2. With the float sensor on the Y1 line:



STEP 3: Connect Power

Power the unit using either the power from the HVAC system or a plug-in transformer (not included).

- 16 – 28 VAC or 12 – 24 VDC

STEP 4: Note LED lights on REM50Z

Six green LEDs are used to indicate the network and sensor states.

LD1 – Float SW LED

- 1) Off if Float Switch is reset
- 2) On if Float Switch is tripped

LD2 – Status LED

- 1) Blinking if not enrolled on a Z-Wave network
- 2) Solid if enrolled on a Z-Wave network

LD3 – S1 LED

- 1) Off if Supply Air Sensor is not attached or out of range
- 2) On if Supply Air Sensor is attached

LD4 – S2 LED

- 1) Off if Return Air Sensor is not attached or out of range
- 2) On if Return Air Sensor is attached

LD5 – S3 LED

- 1) Off if Low Side Coil Sensor is not attached or out of range
- 2) On if sensor 4 is attached

LD6 – S4 LED

- 1) Off if High Side Coil Sensor is not attached or out of range
- 2) On if High Side Coil Sensor is attached

STEP 5: Z-Wave® Installation

The Status LED (Green) is used to indicate the network state

- Green Flashing (rapid) – UNINSTALLED
 - No Node ID assigned
- Green ON steady– Node ID assigned

Z-Wave® Installation

Z-Wave® controllers from various manufacturers support the Z-Wave process of adding or removing a device from a network. The REM50Z 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 REM50Z to be included or removed from a Z-Wave network.

Inclusion: Including the REM50Z into an Existing Network:

1. Set your primary controller to Include mode, to add the REM50Z as a node on your network (see your controller's user manual for detailed instructions).
2. Press the Install button. The controller will indicate the device has been included into the network. Your controller will indicate the REM50Z was successfully added to its network (see your controller's user manual for details). 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: Consult your controller's user manual for details on removing a device from a Z-Wave network.

Exclusion: Removing the REM50Z from a Network:

1. Set your primary controller to Remove mode, to remove the REM50Z as a node on your network (see your controller's user manual for detailed instructions).
2. Press the Install button. The controller will indicate the device has been removed from the network.

Factory Reset

NOTE: A Factory Reset should only be performed if the network controller is missing or inoperable.

To reset the REM50Z's configurations and Z-Wave parameters to Factory Settings (Including association groups and scene configurations), and remove the REM50Z from any Z-Wave network:

1. Hold down the Install button for approximately 10 seconds
2. Release the install button (the REM50Z will reset all internal configuration including Z-Wave configurations). The unit will then reset.
3. When the Status LED begins to blink (un-enrolled) the unit has finished restoring configurations is running in normal mode.

A Restore Defaults will be performed automatically when removed from a network.

For additional information about the Z-Wave® network including information on the Association Groups and the Configuration Parameters please refer to the following document:

- [“REM50Z Z-Wave Specification Rev M”](#)

TROUBLESHOOTING

REM50Z

Condition	Description/What is Observed	Causes & Actions
Status LED	not ON	CAUSE: No Power. ACTION: Check wiring and connection. Verify the circuit breakers are in the ON position.
Status LED	not flashing rapidly for ZWave Installation	CAUSE: Unit is already installed in a ZWave network. ACTION: Uninstall unit.

WARRANTY

LIMITED WARRANTY for RCS REM50Z

One-Year Limited Warranty

RCS (USA), ("RCS") warrants its "REM50Z Meter" to be free from defects in workmanship and materials under normal application, use and installation, and service conditions for a period of one year from the date of sale to the original buyer/end user. If the unit malfunctions or becomes inoperable due to a defect in workmanship or material during the one-year period of this warranty, RCS will, at its option, either repair or replace the unit or refund the purchase price. This limited warranty shall transfer from the original buyer/end user to subsequent buyers/end users for the remainder of the warranty term provided the unit is not moved or relocated from its originally installed location.

Warranty Exclusions

If, in RCS'S sole judgment, an REM50Z Meter has been subject to misuse, neglect or accident or has been damaged through abuse, alteration, improper installation or application, failure to follow RCS'S operation or maintenance instructions, or negligence in transportation, handling, or storage, or repaired by anyone other than RCS and its authorized dealers/installers, this warranty will not be applicable. This warranty will also not cover damage due to acts of God, power failures, lightning, fire, flood, severe weather, hailstorms, insect and pest infestation, and other events reasonably beyond RCS's control. Warranty coverage does not include any transportation costs for return of unit, for reshipment of any repaired or replaced unit, or costs associated with removal, installation or reinstallation of the unit.

Limitations of Warranty and Liability

Damage to persons or property or other loss or injury resulting from defect in the REM50Z Meter or from improper installation or use shall not be the responsibility of RCS. RCS will not under any circumstances be liable for any indirect, special, incidental or consequential damages of any nature, whether based on contract, tort or other legal theory including, without limitation, business interruption costs, removal and/or reinstallation costs, re-procurement costs, loss of profit or revenue, loss of data, promotional or manufacturing expenses, overhead charges, injury to business reputation or loss of customers, even if RCS has been advised of the possibility of such damages. In all cases, RCS'S total liability will be limited to the price of products provided or services performed by RCS. **NO IMPLIED STATUTORY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.**

REM50Z Z-Wave Specification

Product: REM50Z

History

Date	Rev	FW Version	Description
12/09/17	M	1.12	Added FW Ver column. Added dynamic filtering to adjust for delays having more than one sensor adds.
11/29/17	M	1.11	Fixed Association set not working on install. Fixed install getting messed up if you press the install button again during installation. Also, a hardware change was made by changing C7 from a 470 pF to a 0.47 uF. Added temp offset.
11/01/17	L	1.10	Now sending a multilevel sensor report with every multichannel encapsulated report from sensor 1(Supply) for legacy devices.
10/31/17	K	1.09	Changed time constant configuration parameters to be in seconds. Filtering is now consistent with time constant.
10/3/17	J	1.06	Added MultiChannel CC description. Updated SensorMultilevel CC description. Added configuration registers 22-25.
9/7/17	I	1.05	Changed Sensor names and LED order to match new labels.
7/27/17	H	1.04	Added note on association group mapping. Firmware now answers as asked for Multichannel CC. Periodic reporting for temp sensors now unable to be disabled.
5/22/17	G	1.03	Changed how LED's are defined. Notification version changed to 8. Added FS description and wiring diagrams. Removed F/C Mode.
3/31/17	F	1.02	Reverted LED info. Changed endpoint association groups.
3/22/17	E		Fixed CC versions
3/17/17	D		Fixed typos, changed LED uses, Added icon info for Endpoints
3/15/17	C		Adding Endpoint info, adjusting Config parameters to reflect.
3/06/17	B		
11/30/16	A		First Draft

History	1
Introduction.....	2
Z-Wave® Installation.....	2
Factory Reset.....	3
Hardware.....	3
Push Button Switch	3
LD1 – Float SW LED	3
LD2 – Status LED	3
LD3 – Supply LED	3
LD4 – Return LED	3
LD5 – Low LED	3
LD6 – High LED.....	3
Temp Sensors	4
Float Sensor	4
Powerup Defaults	5
Z-Wave.....	5
COMMAND CLASSES.....	6
COMMAND_ZWAVEPLUS_INFO_V2	6
COMMAND_CLASS_VERSION_V2	6
COMMAND_CLASS_BASIC	6
COMMAND_CLASS_MANUFACTURER_SPECIFIC.....	7
COMMAND_CLASS_POWER_LEVEL.....	7
COMMAND_CLASS_NOTIFICATION_V8.....	7
COMMAND_CLASS_ASSOCIATION_V2.....	8
COMMAND_CLASS_DEVICE_RESET_LOCALLY.....	9

COMMAND_CLASS_MULTICHANNEL_V4	9
COMMAND_CLASS_MULTICHANNEL_ASSOCIATION_V3	9
COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2	9
COMMAND_CLASS_ASSOCIATION_GROUP_INFORMATION	9
COMMAND_CLASS_SENSOR_MULTILEVEL_V5	9
COMMAND_CLASS_CONFIGURATION	11

Introduction

This document will cover the REM50Z Z-Wave™ Command Class and other Z-Wave™ related topics.

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. When the REM50Z sends a Node Info Report, it reports itself as a Routing Slave device with:

Z-Wave® Installation

Z-Wave® controllers from various manufacturers support the Z-Wave process of adding or removing a device from a network. The REM50Z 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 REM50Z to be included or removed from a Z-Wave network.

Inclusion: Including the REM50Z into an Existing Network:

1. **Set your primary controller to Include mode**, to add the REM50Z as a node on your network (see your controller's user manual for detailed instructions).
2. **Press the Install button. The controller will indicate the device has been included into the network.**

Your controller will indicate the REM50Z was successfully added to its network (see your controller's user manual for details). *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: Consult your controller's user manual for details on removing a device from a Z-Wave network.

Exclusion: Removing the REM50Z from a Network:

1. **Set your primary controller to Remove mode**, to remove the REM50Z as a node on your network (see your controller's user manual for detailed instructions).
2. **Press the Install button. The controller will indicate the device has been removed from the network.**

Factory Reset

To reset the REM50Z's configurations and Z-Wave parameters to Factory Settings (Including association groups and scene configurations), and remove the REM50Z from any Z-Wave network:

1. Hold down the Install button for approximately 10 seconds
2. Release the install button (the REM50Z will reset all internal configuration including Z-Wave configurations). The unit will then reset.
3. When the Status LED begins to blink (un-enrolled) the unit has finished restoring configurations is running in normal mode.

A Restore Defaults will be performed automatically when removed from a network.

Hardware

Push Button Switch

The Push Button switch is used for several purposes.

- 1) Add and Remove from a Z-Wave network
- 2) If held down for approximately 10 seconds, a restore default is performed

LD1 – Float SW LED

- 1) Off if Float Switch is reset
- 2) On if Float Switch is tripped

LD2 – Status LED

- 1) Blinking if not enrolled on a Z-Wave network
- 2) Solid if enrolled on a Z-Wave network

LD3 – Supply LED

- 1) Off if Supply Air Sensor is not attached or out of range
- 2) On if Supply Air Sensor is attached

LD4 – Return LED

- 1) Off if Return Air Sensor is not attached or out of range
- 2) On if Return Air Sensor is attached

LD5 – Low LED

- 1) Off if Low Side Coil Sensor is not attached or out of range
- 2) On if sensor 4 is attached

LD6 – High LED

- 1) Off if High Side Coil Sensor is not attached or out of range
- 2) On if High Side Coil Sensor is attached

Temp Sensors

Four temperature sensors inputs are available:

- | | |
|----------------------|---------------------|
| 1) Supply Air Sensor | 3) Coil Low Sensor |
| 2) Return Air Sensor | 4) Coil High Sensor |

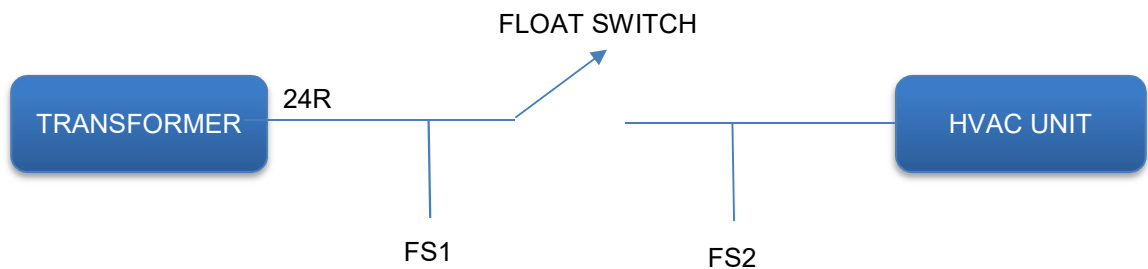
All temperature sensors have the following properties:

- 1) 10K Type-A curve TYPE 2 or 3 selectable with Configuration Command Class
- 2) Range : 5.0F – 160.0F (-15.0C – 71.0C)
- 3) Invalid/Missing Sensor value: 191.0

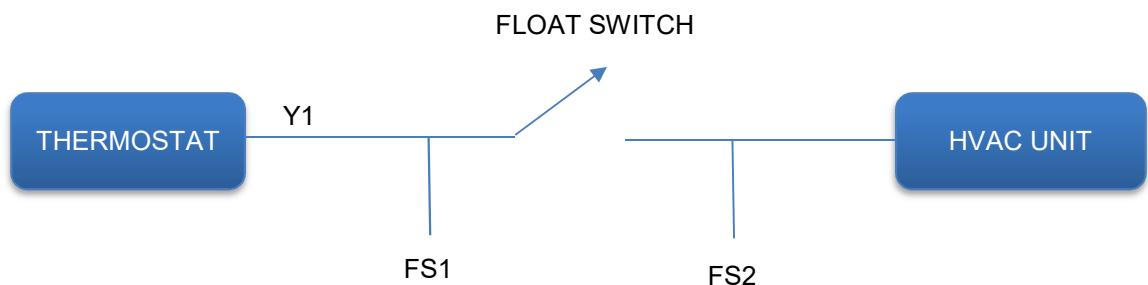
Float Sensor

The float sensor inputs, FS1 and FS2, must be wired to each side of the float sensor in one of the following setups:

1. With the float sensor on the 24R line:



2. With the float sensor on the Y1 line:



Note:

- The float sensor will be in a “tripped” state when there is 24VAC at the FS1 input **and** the FS2 input.
 - In this state the FS LED will be lit and the following notification report will be sent:
 - Notification Type: Water Alarm
 - Event: Water Level Alarm (0x09)
 - Event Parameter: Above High Threshold
- The float sensor will be in a “reset” state when there is 24VAC at the FS1 input **and no** voltage detected at the FS2 input.
 - In this state the FS LED will be off and the following notification report will be sent:
 - Notification Type: Water Alarm
 - Event: Event Inactive (0x00)

Powerup Defaults

The REM50Z powerup specific defaults are:

- All Configuration Registers retain their values on power cycle

Z-Wave

The REM50Z contains a Z-Wave 500 Series Module that supports Z-Wave Plus features. A Z-Wave certified portable or stationary controller can communicate with the REM50Z.

Root Device - Device Type / Supported Command Classes / Icon:

GENERIC_TYPE_SENSOR_MULTILEVEL
SPECIFIC_TYPE_ROUTING_MULTILEVEL_SENSOR

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

- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_MANUFACTURER_SPECIFIC
- COMMAND_CLASS_VERSION_V2
- COMMAND_CLASS_ASSOCIATION_V2
- COMMAND_CLASS_ASSOCIATION_GROUP_INFORMATION
- COMMAND_CLASS_DEVICE_RESET_LOCALLY
- COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2
- COMMAND_CLASS_SENSOR_MULTILEVEL_V5
- COMMAND_CLASS_CONFIGURATION
- COMMAND_CLASS_MULTI_CHANNEL_V4
- COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
- COMMAND_CLASS_POWER_LEVEL
- COMMAND_CLASS_NOTIFICATION_V8

ICON_TYPE_SPECIFIC_SENSOR_MULTILEVEL_MULTIDEVICE

Endpoints 1-4 - Device Type / Supported Command Classes / Icon:

GENERIC_TYPE_SENSOR_MULTILEVEL
SPECIFIC_TYPE_ROUTING_MULTILEVEL_SENSOR

- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_ASSOCIATION_V2
- COMMAND_CLASS_ASSOCIATION_GROUP_INFORMATION
- COMMAND_CLASS_SENSOR_MULTILEVEL_V5
- COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3

ICON_TYPE_GENERIC_SENSOR_MULTILEVEL

Endpoint 5 - Device Type / Supported Command Classes:

GENERIC_TYPE_SENSOR_NOTIFICATION
SPECIFIC_TYPE_NOTIFICATION_SENSOR

- COMMAND_CLASS_ZWAVEPLUS_INFO_V2
- COMMAND_CLASS_ASSOCIATION_V2
- COMMAND_CLASS_ASSOCIATION_GROUP_INFORMATION
- COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION_V3
- COMMAND_CLASS_NOTIFICATION_V4

ICON_TYPE_SPECIFIC_SENSOR_NOTIFICATION_WATER_ALARM

COMMAND CLASSES

COMMAND_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_ALWAYS_ON							
Node Type							
NODE_TYPE_ZWAVEPLUS_NODE							
Installer Icon Type MSB							
ICON_TYPE_SPECIFIC_SENSOR_MULTILEVEL_MULTIDEVICE (0x0D)							
Installer Icon Type LSB							
ICON_TYPE_SPECIFIC_SENSOR_MULTILEVEL_MULTIDEVICE (0xFF)							
User Icon Type MSB							
ICON_TYPE_SPECIFIC_SENSOR_MULTILEVEL_MULTIDEVICE (0x0D)							
User Icon Type LSB							
ICON_TYPE_SPECIFIC_SENSOR_MULTILEVEL_MULTIDEVICE (0xFF)							

COMMAND_CLASS_VERSION_V2

Send VERSION_GET. The returned message is:

Application Version is the Z-Wave™ processor code version
Application Sub Version is the processor code version

COMMAND_CLASS_BASIC

Sends no response.

COMMAND_CLASS_MANUFACTURER_SPECIFIC

Send MANUFACTURER_SPECIFIC_GET. The return message will contain one the following:

Manufacturer ID: 0x0010
Product Type ID: "EM" (0x45, 0x4D)
REM50Z Product ID: "50" (0x35, 0x30)

COMMAND_CLASS_POWER_LEVEL

POWERLEVEL_SET:

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_NOTIFICATION_V8

The REM50Z's Float Sensor was designed in push mode and will therefore send an unsolicited notification each time the sensor detects that the Float Sensor was tripped and when it was reset.

Float Sensor Tripped:

Notification Type: Water Alarm
Event: Water Level Alarm (0x09)
Event Parameter: Above High Threshold

Float Sensor Reset:

Notification Type: Water Alarm
Event: Event Inactive (0x00)

COMMAND_CLASS_ASSOCIATION_V2

Endpoint	Association Group(Name)	Max Number of Nodes per Group	Supported Events
0 (Root)	1 (Lifeline)	1	• Device Reset Locally • Supply Air Sensor (Multilevel Sensor Report and Multilevel Sensor Report, Multichannel) • Return Air Sensor (Multilevel Sensor Report, Multichannel) • Coil Low Sensor (Multilevel Sensor Report, Multichannel) • Coil High Sensor (Multilevel Sensor Report, Multichannel) • Float Sensor(Notification Report)
	2 (Temp 1 Report)	2	• Supply Air Sensor (Multilevel Sensor Report, Multichannel)
	3 (Temp 2 Report)	2	• Return Air Sensor (Multilevel Sensor Report, Multichannel)
	4 (Temp 3 Report)	2	• Coil Low Sensor (Multilevel Sensor Report, Multichannel)
	5 (Temp 5 Report)	2	• Coil High Sensor (Multilevel Sensor Report, Multichannel)
	6 (Float Sen Notif)	2	• Float Sensor(Notification Report)
1 (EP1 Temperature)	1	0	• Supply Air Sensor (Multilevel Sensor Report, Multichannel)
	2	2	
2 (EP1 Temperature)	1	0	• Return Air Sensor (Multilevel Sensor Report, Multichannel)
	2	2	
3 (EP1 Temperature)	1	0	• Coil Low Sensor (Multilevel Sensor Report, Multichannel)
	2	2	
4 (EP1 Temperature)	1	0	• Coil High Sensor (Multilevel Sensor Report, Multichannel)
	2	2	
5 (EP5 Float)	1	0	• Float Sensor(Notification Report)
	2	2	

NOTE: Association group 1 of endpoints 1-5 map to association 1 of the root device. Association group 2 of endpoints 1-5 map to association groups 2-6 of the root device respectively.

COMMAND_CLASS_DEVICE_RESET_LOCALLY

If the install button is held down until all LED's are lit (approx. 10 sec), the REM50 will send a Device Reset Locally report, restore default settings, remove itself from the network and reboot.

COMMAND_CLASS_MULTICHANNEL_V4

You **must** use this command class to request temperature reports for all 4 temperature sensors.

To do so, use the following command:

MULTI_CHANNEL_CMD_ENCAP:

Returns the MULTI_CHANNEL_CMD_ENCAP

7	6	5	4	3	2	1	0
Command Class = COMMAND_CLASS_MULTI_CHANNEL							
Command = MULTI_CHANNEL_CMD_ENCAP							
Res	Source End Point = Requesting Node Endpoint(usually 0)						
Bit address	Destination End Point = 1,2,3 or 4 depending on which sensor you want						
Command Class = COMMAND_CLASS_SENSOR_MULTILEVEL							
Command = SENSOR_MULTILEVEL_GET							
Parameter 1 = 1 for Temperature							
Parameter 2 = 8 for F , or 0 for C							

COMMAND_CLASS_MULTICHANNEL_ASSOCIATION_V3

Supported – see COMMAND_CLASS_ASSOCIATION_V2

COMMAND_CLASS_FIRMWARE_UPDATE_MD_V2

The Firmware update command class allows updating firmware in Z-Wave micro.

Refer to the REM50Z Z-Wave Over the Air Update Spec for details.

COMMAND_CLASS_ASSOCIATION_GROUP_INFORMATION

Supported

COMMAND_CLASS_SENSOR_MULTILEVEL_V5

The REM50Z only supports temperature sensor 1 accessed through the multilevel sensor command class. This is for backwards compatibility with legacy devices. **Please use COMMAND_CLASS_MULTICHANNEL_V4 if your device supports it.**

The REM50Z will respond with the default V1 Temperature SENSOR REPORT (scale = F, size = 2) 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	0	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, used for SI temp)							
0	0	0	0	Scale bit mask 0x03 for C & F			

SENSOR_MULTILEVEL_GET:

Returns the SENSOR_MULTILEVEL_REPORT

7	6	5	4	3	2	1	0
COMMAND CLASS SENSOR_MULTILEVEL							
SENSOR_MULTILEVEL_REPORT							
0x01 (Temperature)							
001 (F precision) 001 (C precision)			Scale 00 (C) 01 (F)		002 (F size) 002 (C size)		
Temperature Value (MSB)							
Temperature Value (LSB)							

COMMAND_CLASS_CONFIGURATION

There are configuration parameters accessible via the COMMAND_CLASS_CONFIGURATION.

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
1	RS1 Sensor Cal	1	N	0	-7 to +7	-7 to +7
2	RS2 Sensor Cal	1	N	0	-7 to +7	-7 to +7
3	RS3 Sensor Cal	1	N	0	-7 to +7	-7 to +7
4	RS4 Sensor Cal	1	N	0	-7 to +7	-7 to +7
5	RS1 Lifeline Temperature Delta Autosend Threshold (how many degree change from the last AutoSend)	1	N	1	1-20 (degrees)	1-20 (degrees)
6	RS2 Lifeline Temp Delta Autosend Threshold	1	N	1	1-20 (degrees)	1-20 (degrees)
7	RS3 Lifeline Temp Delta Autosend Threshold	1	N	1	1-20 (degrees)	1-20 (degrees)
8	RS4 Lifeline Temp Delta Autosend Threshold	1	N	1	1-20 (degrees)	1-20 (degrees)
9	RS1 Lifeline Periodic Temperature Send Interval	1	N	120	1 – 120 (min)	1 – 120 (min)
10	RS2 Lifeline Periodic Temperature Send Interval	1	N	120	1 – 120 (min)	1 – 120 (min)
11	RS3 Lifeline Periodic Temperature Send Interval	1	N	120	1 – 120 (min)	1 – 120 (min)
12	RS4 Lifeline Periodic Temperature Send Interval	1	N	120	1 – 120 (min)	1 – 120 (min)
13	RS1 Group2 Temperature Delta Autosend Threshold (how many degree change from the last AutoSend)	1	N	1	1-5 (degrees)	1-5 (degrees)

Config Parameter #	Description	Length (bytes)	Send Unsolicited on change	Default Value	Read values	Write values
14	RS2 Group3 Temp Delta Autosend Threshold	1	N	1	1-5 (degrees)	1-5 (degrees)
15	RS3 Group4 Temp Delta Autosend Threshold	1	N	1	1-5 (degrees)	1-5 (degrees)
16	RS4 Group5 Temp Delta Autosend Threshold	1	N	1	1-5 (degrees)	1-5 (degrees)
17	RS1 Group2 Periodic Temperature Send Interval	1	N	0	0 = Disabled, 1 – 120 (min)	0 = Disabled, 1 – 120 (min)
18	RS2 Group3 Periodic Temperature Send Interval	1	N	0	0 = Disabled, 1 – 120 (min)	0 = Disabled, 1 – 120 (min)
19	RS3 Group4 Periodic Temperature Send Interval	1	N	0	0 = Disabled, 1 – 120 (min)	0 = Disabled, 1 – 120 (min)
20	RS4 Group5 Periodic Temperature Send Interval	1	N	0	0 = Disabled, 1 – 120 (min)	0 = Disabled, 1 – 120 (min)
21	HVAC Thermistor Curve	1	N	0	0 = 10k 2, 1 = 10k 3	0 = 10k 2, 1 = 10k 3
22	RS1 Time Constant	1	N	10	1-60 (Seconds)	1-60 (Seconds)
23	RS2 Time Constant	1	N	10	1-60 (Seconds)	1-60 (Seconds)
24	RS3 Time Constant	1	N	10	1-60 (Seconds)	1-60 (Seconds)
25	RS4 Time Constant	1	N	10	1-60 (Seconds)	1-60 (Seconds)