MultiSensor 7

ZWA024

Engineering Specifications

This product can be included and operated in any Z-Wave™ network with other Z-Wave™ certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

1 Library and Command Classes

1.1 Embedded SDK

v7.12.2

1.2 Device Type

Generic Device Class: GENERIC_TYPE_SENSOR_NOTIFICATION (0x07)
Specific Device Class: SPECIFIC_TYPE_NOTIFICATION_SENSOR (0x01)

1.3 Role Type

Reporting Sleeping Slave (RSS): ROLE_TYPE_SLAVE_SLEEPING_REPORTING (0x06)

1.4 Command Class

Command Class	Version	Not added	Non-secure added	Securely added	
				Non-secure CC	Secure CC
Z-Wave Plus Info	2	Support	Support	Support	
Association	2	Support	Support		Support
Association Group Information	3	Support	Support		Support
Multi Channel Association	3	Support	Support		Support
Battery	1	Support	Support		Support
Binary Sensor	2	Support	Support		Support
Multilevel Sensor	11	Support	Support		Support
Notification	8	Support	Support		Support
Application Status	1	Support	Support	Support	
Configuration	4	Support	Support		Support
Transport Service	2	Support	Support	Support	

Version	3	Support	Support		Support
Wakeup	2	Support	Support		Support
Manufacturer Specific	2	Support	Support		Support
Device Reset Locally	1	Support	Support		Support
Indicator	3	Support	Support		Support
Powerlevel	1	Support	Support		Support
Security 0/2	1	Support	Support	Support	
Supervision	1	Support	Support	Support	
Firmware Update Meta Data	5	Support	Support		Support

2 Z-Wave™ Network Operation

Functions	Action Button	Description
Add[1]	Tap one time	**Add this device into an existing Z-Wave network:** 1. Power on the device, the power led will blink blue slowly. 2. Let the Primary Controller into inclusion mode (If you don't know how to do this, refer to its manual) 3. Press the action button one time, when the yellow led on release the button. It indicates the device has enter learn mode. 4. If added successful, the power led will flash (white -> green -> white -> green at a rate of 250ms per each color) for 2 seconds.
Remove[1]	Tap one time	**Remove this device from an existing Z-Wave network:** 1. Power on the device. 1. Let the Primary Controller into exclusion mode (If you don't know how to do this refer to its manual) 2. Press the action button one time, when the purple led on release the button. It indicates the device has enter learn mode. If removed successful, the blue led will blink slowly.
Wakeup Notify	Hold for 2~5s	1. Power on and make sure the device has been included into Z-Wave network. 2. Press and hold the button at least 2s until Red Led Is On and then release the button, device will send wake up notification to controller if device is in a Z-Wave network.

5 Minutes Wakup State	Hold for 5~9s	Enter 5 minutes wakeup state: 1. Power on and make sure the device has been included into Z-Wave network. 2. Press and hold button for 5 seconds, when orange led on release it. If orange led keep on, it indicates state entered. Exit 5 minutes wakeup state: 1. Power on and make sure the device has been included into Z-Wave network. 2. Press and hold button for 5 seconds, when orange led on release it. If led off, it indicates state exited.
RF Quality Test	Hold for 9~15s	1. Power on the device and make sure it has been included into the Z-Wave network. 2. Press and hold the button for 9 seconds, when the cyan led on release the button. Then, it will enter the power level test mode. At this mode, the Hot Water Switch device will send 100 frames to remote device to diagnostic network quality. 3. After the test, if >= 97 frames receive ACK, the green led will turn on 2 seconds. This indicates the network is Good. 4. If >=90 frames receive ACK, the yellow led will turn on 2 seconds. This indicates the network is OK. 5. If < 90 frames receive ACK, the red led will turn on 2 seconds. This indicates the network is Bad.
Factory Reset	Hold for 15~20s	1. Make sure the device has been powered. 2. Press and hold the button for 15 seconds. When the red led flash, the device will enter factory reset mode. 3. If reset successful, the blue led will blink slowly.

1) This device must be used in conjunction with a Security Enabled Z-Wave Controller in order to fully utilize all implemented functions.

3 Button Action and LED Indicator

Unit: second

Action	Press down Action Button	Release Action Button
Tap 1 time [0.04, 1)	Solid yellow status	Turns on a solid yellow status, If a new node id is assigned to this device, the yellow LED will keep solid until whole network processing is complete (or entering. If successful, the LED will flash white -> green -> white -> green (at a rate of 250ms per each color change) for 2 seconds. After 2 seconds have finished, use typical paired status LED indicators for ON/OFF status from parameter #1.

Tap 2 times [0.04, 1)	Purple LED keeps on for 2 seconds and then off	If exclusion is successful, the LED should pulse blue color slowly.
Tap 4 times [0.04, 2)	N/A	If parameter 32 is set to 2, this will be used to cancel the alarm. See parameter 30,31,32 for more information.
Press and hold [1, 2)	Turn LED off	
Press and hold [2, 5)	Solid orange status	LED revert back to LED state based on network state. If parameter 32 is set to 4, this will be used to cancel the alarm. See parameter 30,31,32 for more information.
Press and hold [5, 9)	Solid cyan status	See power level test mode.
Press and hold [9, 15)	Solid red status	N/A
Press and hold [15, 20)	Red color will blink on and off at a rate of 200ms for 2 seconds and then pulse blue color if removed	Reset to factory default
Press and hold [20, ∞)	N/A	N/A

4 Association Groups

The device supports 11 association groups and every group supports max 5 associated nodes.
Group 1 is lifeline group, all nodes which associated in this group will receive the messages sent by device through lifeline.

When Basic CC/Switch Binary CC are used to control this device or sent through association groups to control other associated nodes, the variable will be phased as the follow ways:
0x01~0x063/0xff means On, 0x00 means Off, other values will be ignored.

The Command Class supported by each association group is shown in the table below:

Root Device

ID	Name	Nodes	Profile	Description
1	Lifeline	5	General: Lifeline	**Device Reset Locally:** When factory reset. **Notification Report:** See Notification Chapter for more information.

				Sensor Binary Report: See Param5 for more information. **Sensor Multilevel Report:** When sensors above over limit or below under limit. **Battery Report:** See Param101. **Indicator Report:** Issued when the indicator light changed.
2	Motion	5	General: NA	**Basic Set:** Basic Set Command will be sent to the associated device when motion trigger or untrigger. The basic set value is determined by Param11, Param12. See Param13 for more information.
3	OverHeat	5	Sensor:Temperature	**Basic Set:** When the temperature change value is over or under the threshold set by Param16. Scale is determined by Param64.
4	UnderHeat	5	Sensor:Temperature	**Basic Set:** When the temperature change value is under or over the threshold set by Param17. Scale is determined by Param64.
5	OverHumidity	5	Sensor:Humidity	**Basic Set:** When the current humidity is over or under the threshold set by Param14.
6	UnderHumidity	5	Sensor:Humidity	**Basic Set:** When the current humidity is under or over the threshold set by Param15.
7	OverLight	5	Sensor:Illuminance	**Basic Set:** When the current light/lux is over or under the threshold set by Param18.
8	UnderLight	5	Sensor:Illuminance	**Basic Set:** When the current light/lux is under or over the threshold set by Param19.
9	OverUV	5	Sensor:Ultraviolet	**Basic Set:** When the current UV is over or under the threshold set by Param20.
10	UnderUV	5	Sensor:Ultraviolet	**Basic Set:** When the current UV is under or over the threshold set by Param21.
11	Temperature	5	Sensor:Temperature	

5 Basic Command Map

Basic Command	Mapped Command
Basic Set	
Basic Get	
Basic Report	

6 Wakeup

The device stays in sleep status for the majority of time in order to conserve battery life.

The minimum wakeup interval is 1800 seconds(30 minutes)

The maximum wakeup interval is 86400 seconds(24 hours)

The default wakeup interval is 28800 seconds(8 hours) The value is greater, the battery life is longer.

Allowable min step among each wakeup interval is 60 seconds, such as 1860s, 1920s, 1980s...

> **ⓘ** If the product is in sleep state for a long time and your gateway shows it is in offline state, you can rediscover it via pressing and holding the Action Button for 3 seconds, then the Sensor will send a wake_up notification report to your gateway and let your gateway that it is still online.

7 Battery

Battery level will be checked every time the device wake up. These includes the wakeup timer, motion trigger, button click.

When the battery state changed, a battery report command will be sent to the controller.

8 Multilevel Sensor

The device has a temperature/humidity sensor and a ambient light/uv sensor. The ambient temperature/humidity and light/uv will be checked period.

See Param16,17,40,41,45,46,48,49,50,51 and 64 for more information.

Command Class	COMMAND_CLASS_SENSOR_MULTILEVEL
Command	SENSOR_MULTILEVEL_REPORT
Type	Air Temperature
Scale	Celsius(EU) / Fahrenheit (US)

See Param14,15,40,42,45,48,52,53,54 for more information.

Command Class	COMMAND_CLASS_SENSOR_MULTILEVEL
Command	SENSOR_MULTILEVEL_REPORT

Type	Humidity
Scale	Percentage value

See Param18,19,40,43,45,48,55,56,57 for more information.

Command Class	COMMAND_CLASS_SENSOR_MULTILEVEL
Command	SENSOR_MULTILEVEL_REPORT
Type	Illuminance
Scale	Lux

See Param20,21,40,44,45,48,58,59,60 for more information.

Command Class	COMMAND_CLASS_SENSOR_MULTILEVEL
Command	SENSOR_MULTILEVEL_REPORT
Type	Ultraviolet
Scale	UV index

9 Notification

Notification Type	Notification Event/State	Description
Home Security (0x07)	State idle	Notification value for the state variable going to idle.
	Motion detection (0x08)	When motion triggered.
	Tampering, product moved (0x09)	When vibrating.
Power Management (0x08)	AC mains disconnected (0x02)	When USB disconnected and insert battery again.
	AC mains re-connected(0x03)	When insert the USB cable.
	Replace battery soon (0x0A)	When battery level below the param39 value.
	Replace battery now (0x0B)	When battery level below 2.0V.
System(0x09)	System software failure (manufacturer proprietary failure code provided) (0x04)	When watch dog timeout.

10 Manufacturer Information

Parameter	Value
Manufacturer ID 1	0x03
Manufacturer ID 2	0x71
Product Type ID 1	0x00=EU, 0x01=US, 0x02=AU
Product Type ID 2	0x02
Product ID 1	0x00

Product ID 2	0x18

11 Configuration

User can change the default settings by the below configuration parameters. After device reset, all these parameters will be set to their default values.

Properties:

R=Readable, W=Writable, S=Signed Integer, U=Unsigned Integer, E=Enumerated, B=Bit filed

(Param 1) Beaming Enable/Disable

Used to enable/disable beaming. If set to 1, FLiR commands will be supported and device type will be LSS. But the device must be re-included into the network to activate it.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x01	1	0/1	0	R/W/E

0 - disable

1 - enable

(Param 2) Motion Retrigger Time

Presence re-detection time set in second to allow motion sensor to reset timeout of motion sensor. In this time, the motion sensor can not be triggered again. If this value reach zero, the timeout configuration value set by Param3 will be reset.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x02	2	0~3600	30	R/W/U

0 – disable

1~30 - 30 seconds

30 ~ 3600 - timeout set in seconds

(Param 3) Motion Untrigger Time

Timeout configuration set in second for motion sensor to send no trigger status.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x03	2	30~3600	240	R/W/U

(Param 4) Motion Sensitivity

Set the sensitivity of motion sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x04	1	0~11	11	R/W/U

0 - disable

1 - minimum sensitivity

11 - maximum sensitivity

(Param 5) Motion Report Type

Set which command class will be sent when motion sensor is triggered or detriggered.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x05	1	0/1/2	2	R/W/E

0 - Sends Notification Report

1 - Sends Sensor Binary Report

2 - Sends Notification and Sensor Binary Report

(Param 6) Vibration Sensor Enable/Disable

Used to enable/disable vibration sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x06	1	0~255	255	R/W/U

0 - disable vibration

1~254 - timeout set in minutes to reset vibration status

255 - only send vibration triggered, does not timeout

(Param 7) Vibration Intensity Reports

Used to enable/disable vibration intensity reports. If set to 1, vibration intensity will be sent to gateway when triggered. If set to 0, do not report.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x07	1	0/1	0	R/W/E

(Param 9) Wakeup CC Timeout

Timeout set in seconds after Wakeup CC is send out before go to sleep. If role type is RSS, the minimum value will be 10. If role type is LSS, the minimum value will be 2. If wakeup no more information received, return to sleep mode immediately.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x09	1	2~255	15	R/W/U

(Param 10) Power Status

This value is Readonly. Used to report the power status (USB or Battery powered)

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x0A	1	0/1	-	R/E

0 - When battery powered, the device will act as RSS.

1 - When USB cable insert, the device will act as AOS.

The device must be re-included in the network to change the role type.

(Param 11) Motion Group Control (Group2)

Set control of other devices on group2 based on motion trigger

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x0B	1	0/1/2/3/4/5/6	0	R/W/E

0 - Send BASIC_SET (0xFF) when motion is triggered to associated device

    Send BASIC_SET (0x00) when motion is untriggered to associated device

1 - Send BASIC_SET (0x00) when motion is triggered

    Send BASIC_SET (0xFF) when motion is untriggered

2 - Send BASIC_SET (0xFF) when motion is triggered, Nothing when motion untriggered.

3 - Send BASIC_SET (0x00) when motion is triggered, Nothing when motion untriggered.

4 - Send BASIC_SET (0x00) when motion is untriggered, Nothing when motion triggered.

5 - Send BASIC_SET (0xFF) when motion is untriggered, Nothing when motion triggered.

6 - Send BASIC_SET (value is configured by parameter 12) when motion is triggered to associated devices.

    Send BASIC_SET (value is configured by parameter 12) when motion is untriggered.

(Param 12) Motion Group Value Setting

Set Basic Set value for Group2. The MSB will act as the basic set value when motion trigger. The LSB will act as the basic set value when motion untrigger. E.g. value=0x0A00, then BASIC_SET(0x0A) will be sent when motion trigger, BASIC_SET(0x00) will be sent when motion untrigger.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x0C	2	0~65535	65280	R/W/U

(Param 13) Motion Group Control Requirement

Set threshold of Light/Lux when devices associated in group2 should be triggered by motion. Associated device only receive BASIC_SET command when light <= (this value).

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x0D	2	0~30000	30000	R/W/U

(Param 14) Over Humidity Group Threshold (Group5)

Set threshold of humidity. If measured humidity >= (this value), send BASIC_SET (0xFF) to associated devices through group5. If measured humidity < (this value) send BASIC_SET (0x00) to associated devices through group5.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x0E	1	0~100	60	R/W/U

(Param 15) Under Humidity Group Threshold (Group6)

Set threshold of humidity. If measure humidity <= (this value) send BASIC_SET (0xFF) to associated devices through group6. If measured humidity > (this value) send BASIC_SET (0x00) to associated devices through group6.

Parameter Number	Size (Byte)	Available Settings	Default value	Property

0x0F	1	0 ~100	40	R/W/U

(Param 16) Over Heat Group Threshold (Group3)

Set threshold of temperature. Designed to control Air Conditioners or temperature controllers ON or OFF. If measured temperature >= (this value, Scale is determined by Param64) send BASIC_SET (0xFF) to associated devices. If measured temperature < (this value) send BASIC_SET (0x00) to associated devices. E.g. Value 239 means 23.9 C. Value 750 means 75.0 F.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x10	2	-400~850 (EU/AU) -400~1850 (US)	239 (EU/AU) 750 (US)	R/W/S

(Param 17) Under Heat Group Threshold (Group4)

Set threshold of temperature. Designed to control Air Conditioners or temperature controllers ON or OFF. If measured temperature <= (this value, Scale is determined by Param64) send BASIC_SET (0xFF) to associated devices. If measured temperature > (this value) send BASIC_SET (0x00) to associated devices. E.g. Value 155 means 15.5 C. Value 600 means 60.0 F.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x11	2	-400~850 (EU/AU) -400~1850 (US)	155 (EU/AU) 600 (US)	R/W/S

(Param 18) Over Light Group Threshold (Group7)

Set threshold of Light/Lux. If measured light/lux >= (this value) send BASIC_SET (0xFF) to associated devices. If measured light/lux < (this value) send BASIC_SET (0x00) to associated devices.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x12	2	0~30000	2000	R/W/U

(Param 19) Under Light Group Threshold (Group8)

Set threshold of Light/Lux. If measured light/lux <= (this value) send BASIC_SET (0xFF) to associated devices. If measured light/lux > (this value) send BASIC_SET (0x00) to associated devices.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x13	2	0~30000	100	R/W/U

(Param 20) Over UV Group Threshold (Group9)

Set threshold of UV. If measured UV >= (this value) send BASIC_SET (0xFF) to associated devices. If measured UV < (this value) send BASIC_SET (0x00) to associated devices.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x14	1	0~11	8	R/W/U

(Param 21) Under UV Group Threshold (Group10)

Set threshold of UV. If measured UV <= (this value) send BASIC_SET (0xFF) to associated devices. If measured UV > (this value) send BASIC_SET (0x00 to associated devices.)

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x15	1	0~11	1	R/W/U

(Param 39) Low Battery Threshold

Configure low battery report threshold, sends low battery report via notification and battery report when battery level drops under setting. Unit %.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x27	1	10~90	50	R/W/U

(Param 40) Threshold Check Enable/Disable

Enable/Disable threshold reporting, check time can be adjusted by Param45.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x28	1	0/1	0	R/W/E

0 - disable all threshold reports

1 - enable all threshold reports

(Param 41) Temperature Threshold

Threshold = (Value * 0.1) Scale is determined by Param64. 0 = disable.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x29	1	0~255	10	R/W/U

(Param 42) Humidity Threshold

Humidity range = 1% to 50%, 0 = disable.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x2A	1	0~50	5	R/W/U

(Param 43) Lux Threshold

0 = disable.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x2B	2	0~10000	250	R/W/U

(Param 44) UV Threshold

0 = disable.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x2C	1	0~11	1	R/W/U

(Param 45) Threshold Check Time

Set threshold check time in seconds if threshold is enable via Param40.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x2D	2	1~65535	240	R/W/U

1~65535 - When USB powered

60~65535 - When Battery powered

(Param 46) Low Temperature Report

Eable/Disable alarm report for low temperature(<= -15 C) Multilevel CC temperature report will be sent to gateway.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x2E	1	0/1	1	R/W/E

0 - disable

1 - enable

(Param 48) Sensor Limit Control

This value is bit mask. Used to enable/disable measurement reports for various sensors that is more than the upper limit value or less than the lower limit value.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x30	1	1|2|4|8|16|32|64|128	0	R/W/B

0 - Disabled

1 - Temperature upper level

2 - Humidity upper level

4 - Lux upper level

8 - UV upper level

16 - Temperature lower level

32 - Humidity lower level

64 - Lux lower level

128 - UV lower level

(Param 49) Temperature Upper Limit

Set upper limit level for temperature set in scale of 0.1. Scale is determined by Param64. If (Current measurement) > (Upper Limit), then report sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x31	2	-400~1000 (EU/AU) -400~2120 (US)	280 (EU/AU) 824 (US)	R/W/S

(Param 50) Temperature Lower Limit

Set lower limit level for temperature set in scale of 0.1. Scale is determined by Param64. If (Current Measurement) < (Lower limit), then report sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x32	2	-400~1000 (EU/AU) -400~2120 (US)	0 (EU/AU) 320 (US)	R/W/S

(Param 51) Temperature Recover Limit

Temperature recover limit set in scale of 0.1. Scale is determined by Param64. If (Current measurement) <= (upper limit - recover limit), then temperature report. If (Current measurement) >= (lower limit + recover limit), then temperature report.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x33	1	1~255	20	R/W/U

(Param 52) Humidity Upper Limit

Set humidity upper limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x34	1	0~100	60	R/W/U

(Param 53) Humidity Lower Limit

Set humidity lower limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x35	1	0~100	40	R/W/U

(Param 54) Humidity Recover Limit

Set humidity recover limit level. Refer to Param 51.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x36	1	1~50	5	R/W/U

(Param 55) Lux Upper Limit

Set lux upper limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x37	2	0~30000	1000	R/W/U

(Param 56) Lux Lower Limit

Set lux lower limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x38	2	0~30000	100	R/W/U

(Param 57) Lux Recover Limit

Set lux recover limit level. Refer to Param 51.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x39	1	1~255	100	R/W/U

(Param 58) UV Upper Limit

Set UV upper limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x3A	1	1~11	8	R/W/U

(Param 59) UV Lower Limit

Set UV lower limit level.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x3B	1	1~11	4	R/W/U

(Param 60) UV Recover Limit

Set UV recover limit level. Refer to Param 51.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x3C	1	1~5	1	R/W/U

(Param 61) Out-of-limit State

This is read only and bit mask. Out of the limit state of sensors.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x3D	1	-	-	R/B

Bit Mask:

      0 - within limit

      1 - out of limit

Value:

1 - Temperature upper level

2 - Humidity upper level

4 - Lux upper level

8 - UV upper level

16 - Temperature lower level

32 - Humidity lower level

64 - Lux lower level

128 - UV lower level

(Param 64) Temperature Scale

Set the scale for temperature when reports.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x40	1	0/1	0 (EU/AU) 1 (US)	R/W/E

0 - Celsius

1 - Fahrenheit

(Param 81) LED Activity

Allow user to enable/disable LED activity of specific reports sent by sensor. Button press indicator is not affected by this.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x51	1	0/1	1	R/W/E

0 - disable

1 - enable

(Param 82) Motion Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of motion sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x52	1	0/1/2/3/4/5/6/7/8/9	3	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 83) Temperature Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of temperature sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x53	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 84) Humidity Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of humidity sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x54	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 85) Lux Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of Lux sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x55	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 86) UV Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of UV sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x56	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 87) Vibration Sensor Report Indicator

If LED is enabled by Param81, allow user to change the report color of vibration sensor.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x57	1	0/1/2/3/4/5/6/7/8/9	2	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 88) Battery Report Indicator

If LED is enabled by Param81, allow user to change the report color of battery.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x58	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 89) Wakeup Report Indicator

If LED is enabled by Param81, allow user to change the report color of wakeup.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x59	1	0/1/2/3/4/5/6/7/8/9	8	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 90) Communication Indicator

If LED is enabled by Param81, allow user to change indicator color when receiving communication from gateway or other devices.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x5A	1	0/1/2/3/4/5/6/7/8/9	0	R/W/E

0 - Disabled

1 - Red

2 - Blue

3 - Green

4 - Pink

5 - Cyan

6 - Purple

7 - Orange

8 - Yellow

9 - White

(Param 101) Automatic Report Checklist 1

Checklist 1 for automatic timed report. When the corresponding item is selected, it will be checked when timeout setting by Param111.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x65	1	1|16|32|64|128	241	R/W/B

0 - Disabled

1 - Battery

16 - UV

32 - Temperature

64 - Humidity

128 - Lux

Default 241 = 1 + 16 + 32 + 64 + 128, means all enable.

(Param 102) Automatic Report Checklist 2

Checklist 2 for automatic timed report. When the corresponding item is selected, it will be checked when timeout setting by Param112.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x66	1	1|16|32|64|128	0	R/W/B

0 - Disabled

1 - Battery

16 - UV

32 - Temperature

64 - Humidity

128 - Lux

Max value 241 = 1 + 16 + 32 + 64 + 128, means all enable.

(Param 103) Automatic Report Checklist 3

Checklist 3 for automatic timed report. When the corresponding item is selected, it will be checked when timeout setting by Param113.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x67	1	1|16|32|64|128	0	R/W/B

0 - Disabled

1 - Battery

16 - UV

32 - Temperature

64 - Humidity

128 - Lux

Max value 241 = 1 + 16 + 32 + 64 + 128, means all enable.

(Param 111) Automatic Checklist 1 Interval Time

Interval time set in seconds to check the checklist1's items. Multilevel Sensor Report will be sent when timeout.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x6F	2	30~65535	3600	R/W/U

(Param 112) Automatic Checklist 2 Interval Time

Interval time set in seconds to check the checklist2's items. Multilevel Sensor Report will be sent when timeout.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x70	2	30~65535	3600	R/W/U

(Param 113) Automatic Checklist 3 Interval Time

Interval time set in seconds to check the checklist3's items. Multilevel Sensor Report will be sent when timeout.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0x71	2	30~65535	3600	R/W/U

(Param 201) Temperature Offset Value

Can add or minus this setting value to calibrate temperature when checked. Scale is defined by Param64. e.g. Value 15 means 1.5C or 1.5F.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0xC9	2	-200 ~200	0	R/W/S

(Param 202) Humidity Offset Value

Can add or minus this setting value to calibrate humidity when checked. Unit: %.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0xCA	1	-100~100	0	R/W/S

(Param 203) Lux Offset Value

Can add or minus this setting value to calibrate Lux when checked.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0xCB	2	-10000~10000	0	R/W/S

(Param 204) UV Offset Value

Can add or minus this setting value to calibrate UV when checked.

Parameter Number	Size (Byte)	Available Settings	Default value	Property
0xCC	1	-10~10	0	R/W/S

Multilevel Sensor Report will be sent when timeout.

12 Security Network

This device is a security enabled Z-Wave Plus product that is able to use encrypted Z-Wave Plus messages to communicate to other security enabled Z-Wave Plus products.

The device supports the security function with S0 and S2 encrypted communication. The device will auto switch to the security mode when the device included with a security controller. In the security mode, the commands will use security and security2 command class wrapped to communicate with others, otherwise the device will not response any commands.

This device supports security levels are listed in below table:

Security Levels	Support (Yes/No)
SECURITY_KEY_S0	Yes
SECURITY_KEY_S2_UNAUTHENTICATED	Yes
SECURITY_KEY_S2_AUTHENTICATED	Yes
SECURITY_KEY_S2_ACCESS	No

13 SmartStart

SmartStart enabled products can be added into a Z-Wave network by scanning the Z-Wave QR Code present on the product with a controller providing SmartStart inclusion. No further action is required and the SmartStart product will be added automatically within 10 minutes of being switched on in the network vicinity. You can find the QR code on the bottom of the product, like this:

PIN: 03904

The DSK information will be like this:
03904-29465-27012-32844-35506-05493-46416-50723

14 Specifications

Power Supply	CR123A × 2 or USB powered
Sleep Current	27uA
Wakeup Current	16mA
Action Current	30mA

Inclusion/Exclusion Current	35mA
Power LED	RGB LED
Temperature Sensor	-10°C to 50°C / 14°F to 122°F with accuracy of ±0.5°C
Humidity Sensor	20%RH—80%RH,accuracy:±5% RH (at 25℃)
Light Sensor	0 LUX to 30000 LUX with ±3% accuracy UV 0~11
Communication Frequency	868.40MHz, 869.85MHz (EU) 908.40MHz, 916.00MHz (US)
Communication Range	Up to 70m+ indoors (depending on the building structure) and 150m for outdoors/ open fields.
Communication Certification	Z-Wave Plus with Smart Start
Operational Temperature	0 - 40℃ / 32 - 104℉
Operating Humidity	8% to 80%