Smart Motion Sensor

(NVN-910S)



REVISION RECORD		
Version	Date	Brief description of changes
0.1	2026.10.26	First revision.

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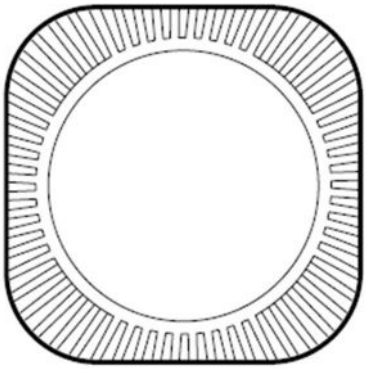
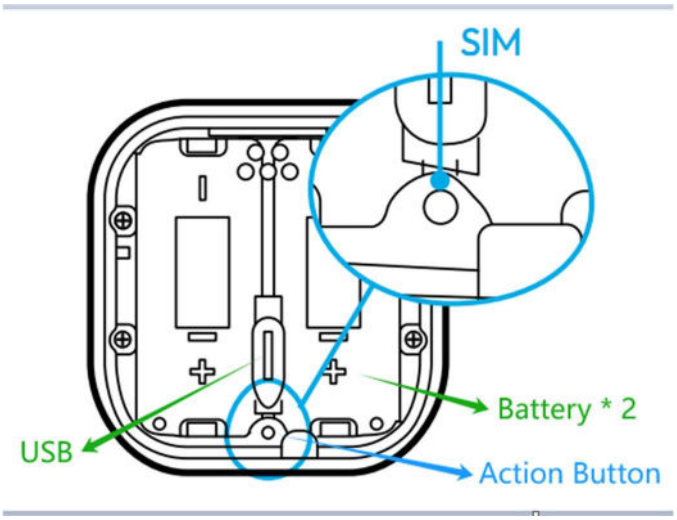
1 OVERVIEW

Smart Motion Sensor adopts Z-Wave® technology and is an intelligent wireless sensor device that integrates motion sensor. The product supports battery or USB power supply. The installation methods include ceiling installation and wall mounted installation, and the sensitivity of motion sensor is also adjustable.

This product supports Security 2 Command Class. While a Security S2 enabled Controller is needed in order to fully use the security feature. This product can be operated in any Z-Wave network with other Z-Wave/ Z-Wave Plus® certified devices from other manufacturers. All mains operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network. This product also supports SmartStart.





Terminology	Description
Action button	Used for networking ,resetting and protect the device.
Led (Red, Green, Blue)	Used for indicating the current state of the product.
Battery	Power supply
USB	Power supply

2 SPECIFICATIONS

2.1 Structural

Parameter	Value
Product Identifier	NVN-910S
Dimensions	Φ55 x 35mm
Color	White
Usage	For indoor use.
Operating Temperature	32~104°F (0~40°C)
Relative Humidity	8%~80%

2.2 Hardware

Parameter	Value
Z-Wave Module	EFR32ZG23
Z-Wave TX Power	Max: 14dBm
Z-Wave Classic Antenna Distance	30m (Indoor) / 150m (Outdoor)
Z-Wave Long Range Antenna Distance	40m (Indoor) / 400m (Outdoor)
Buttons	Action Button x1
Indicator Light Color	Red, Green, Blue
Motion Sensor	12m @0°direction, 10m@±60°direction
Power Type	USB or 2*CR123A

USB Power Supply:

Parameter	Value
Work Current	12mA
Standby Current	6mA

Battery Supply:

Parameter	Value
Work Current	12mA
Standby Current	32uA

2.3 Software

Parameter	Value
Wireless Technology	Z-Wave
Certification Type	Z-Wave Plus v2 Certification
Z-Wave SDK Version	7.23.2
Z-Wave Library Type	Enhanced 232 Slave
Z-Wave Role Type	Always On Slave(USB Power Supply), Reporting Sleeping Slave(Battery Supply).
Generic Product Type	GENERIC_TYPE_SENSOR_NOTIFICATION [0x07]
Specific Product Type	SPECIFIC_TYPE_NOTIFICATION_SENSOR [0x01]
Security Class	Non-Security, S2 Unauthenticated, and S2 Authenticated
SmartStart Compatible	Support. After powering on, SmartStart is auto activated.
Over The Air (OTA)	Support. Firmware can be updated via RF.
Multi Channel Product	No
Association	Support. Refer to Section 4.7 Association Group Info.

Factory Reset	Support. Refer to Section 3.7 How to factory reset.
Power-down Memory	Support. All command settings will stay unchanged even power down.
Control other product	Support. Control other Z-Wave product directly via Group 2 when pir is triggered.

3 QUICK START

3.1 Important safety information

Please read this manual carefully. Failure to follow the recommendations in this manual may be dangerous or may violate the law. The manufacturer, importer, distributor and seller shall not be liable for any loss or damage resulting from failure to comply with the instructions in this manual or any other material. Use this equipment only for its intended purpose. Follow the disposal instructions. Do not dispose of electronic equipment or batteries in a fire or near open heat sources.

3.2 How to install the product

1. Don't install the product in areas of artificial temperature change such as near air conditioners, humidifiers, and heaters, and avoid positioning it directly opposite a window or direct sunlight. Doing so would impact the accuracy of the sensors.
2. If powering it with batteries, do not install the product in a location where the temperature can drop below 0°C / 32°F.
3. Only install your sensor indoors, the product has a 12 meter detection range.
4. Make sure that you connect your product to your hub before finalizing installation.

3.3 How to add the product

The following will step you through adding the product to your Z-Wave network.

1. Open the housing.
2. Remove the battery protection.
3. Press the action button twice quickly.

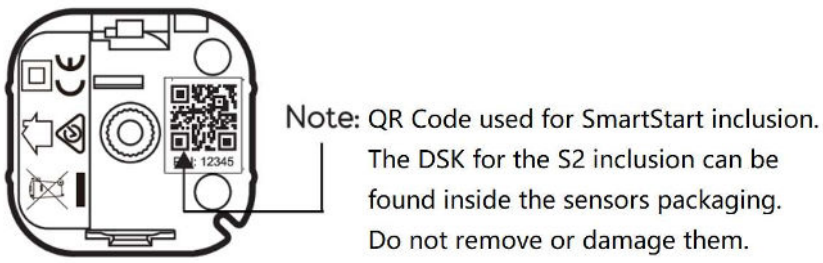
If your Z-Wave gateway supports SmartStart: scan the QR code on device using the gateway's app. Your sensor will join your Z-Wave network automatically.

3.4 How to remove the product

1. Open the housing.
2. Press the action button twice quickly.

3.5 About 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 back of the product, like this:



The DSK for the S2 inclusion can be found inside the sensors packaging, like this, as below:

Z-Wave Device Specific Key (DSK)
DSK:46868-53731-46255-20877-59120-03928-36531-41624



3.6 About Product

This product can be operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers. All mains operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

3.7 How to factory reset

Reset procedure allows to restore the product back to its factory settings, which means all information about the Z-Wave controller and user configuration will be deleted.

1. Make sure the product is powered.

2. Press and hold the button for at least 12s, and then Factory Reset is performed. The product will issue a Device Reset Locally Command via its Lifeline to notify the Lifeline destination that the product has been reset to its factory default state. And it will perform the reset operation regardless of whether or not the delivery of the Device Reset Locally Notification is successful.

Note:

If you press and hold the button, 5 to 12 seconds, the Green LED will fast flash, and then Green LED light 2 seconds until the factory settings are restored.

Resetting the product is not the recommended way of removing the product from the Z-Wave network. Use reset procedure only if the primary controller is missing or inoperable. Certain product removal can be achieved by the procedure of removing described in “How to remove the product”.

3.8 Safety Warning for Batteries

The product contains batteries. Please remove the batteries when the device is not used. Do not mix batteries of different charging level or different brands.

3.9 Long Range

ZWA070 A (US_LR) can be included using Z-Wave Long Range.
ZWA070 C (EU_LR) can be included using Z-Wave Long Range.

3.10 About Z-Wave® Role Type

1. When include to the network using USB power, the role type of the product is Always On. Changing to battery power will keep the role type in its network, which is also a Always On Slave.
2. When powered by battery and include to the network, the role type of the product is Reporting Sleeping. Changing to USB power supply will keep the role type in its network, which is also Reporting Sleeping Slave.
Mark: After switching the power supply mode within the network, it needs to be excluded and re included to the network before it can take effect.

4 SOFTWARE FUNCTION DEFINITION

4.1 User Behavior Interaction

The following brightness levels are all 100% unless otherwise specified.

User behavior / status	Out of the Z-Wave network	In the Z-Wave network
Power OFF	N/A	N/A
Power ON	1, The red and green led will on for 1 second, indicating self inspection. 2, The green led breathing 3 times and then turn off, indication out the Z-Wave network. 3, Send Inclusion Requests for SmartStart Learn Mode.	1, The red and green led will on for 1 second, indicating self inspection 2, LED will light up green for 1 seconds and turn off, indicating in the Z-Wave network. 3, Send Wake Up Notification. 4, Send all sensor data LED will become flash green once, and device will wake up for 15 seconds.
Click Z-Wave button once	**1, Exit Classic Inclusion Learn Mode:** If during the Classic Inclusion Learn Mode, the Classic Learn Mode will exit. LED will turn off. **2, Indicate network status** The green led breathing 3 times and then turn off.	**1, Exit Classic Inclusion Learn Mode:** If during the Classic Inclusion Learn Mode, the Classic Learn Mode will exit. LED will turn off. **2, Send Wake Up Notification** green led will on for 1 second, and device will wake up for 15 seconds(if received wakeup no more information, will go to sleep immediately).
Click Z-Wave button twice	**1. Send Node Info for Adding.** LED will blink green for 30s until it is added into the network. If Adding succeeds, LED will light up green for 2 seconds If Adding fails, LED will turn off. Device will auto-reset and then activate SmartStart Learn Mode again. **2.Exit Classic Inclusion Learn Mode:** If Z-Wave button is clicked again during the Classic Inclusion Learn Mode, the Classic Learn Mode will exit. LED will turn off. Device will auto-reset and then activate SmartStart Learn Mode again.	**1. Send Node Info for Removing.** LED will blink green for 30 seconds until it is removed from the network. If Removing succeeds, LED will light up green for 2 seconds and become breathing light 3 times. If Removing fails, LED will light up red for 1 seconds and turn off **2.Exit Classic exclusion Learn Mode:** If Z-Wave button is clicked again during the Classic exclusion Learn Mode, the Classic Learn Mode will exit. LED will turn off.
Press and hold Z-Wave button for (0, 1s]	LED: OFF	LED: OFF
hold Z-Wave button for (1, 3s]	Green light on 10%	Green light on 10%

hold Z-Wave button for (3，5s]	Green light on 100%	Green light on 100%，Release and enter sensor reporting mode, Send battery report
Press and hold Z-Wave button for (5, 12s]	Green Led will accelerate Flash.	Green Led will accelerate Flash.
Press and hold Z-Wave button for >12s	**Factory Reset And Restart** Green Led will become constantly light for 1 second, and become breathing light indicates the reset is success.	**Factory Reset AND Restart.** Green Led will become constantly light for 1 second, and become breathing light. The device will issue a Device Reset Locally Command via its Lifeline to notify the Lifeline destination that the device has been reset to its factory default state. And it will perform the reset operation regardless of whether or not the delivery of the Device Reset Locally Notification is successful.

4.2 Supported Command Classes

Command Class	Version	Securely 2 added	
		Non-secure CC List	Secure CC List
ZWAVEPLUS_INFO	2	Support	Support
ASSOCIATION	2		Support
MULTI_CHANNEL_ASSOCIATION	3		Support
ASSOCIATION_GRP_INFO	3		Support
TRANSPORT_SERVICE	2	Support	Support
VERSION	3		Support
MANUFACTURER_SPECIFIC	2		Support
DEVICE_RESET_LOCALLY	1		Support
INDICATOR	3		Support
POWERLEVEL	1		Support
BATTERY	1		Support
SENSOR_BINARY	2		Support
CONFIGURATION	4		Support
SECURITY_2	1	Support	Support
NOTIFICATION	8		Support
WAKE_UP	2		Support
SUPERVISION	1	Support	Support
FIRMWARE_UPDATE_MD	5		Support

4.3 Basic Command Class mapping

Basic Command Class is not mapped to any of the supported command classes.

4.4 Z-Wave Plus® Info

Parameter	Value
Z-Wave Plus Version	0x02
Role Type	USB Supply: 5 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_END_NODE_ALWAYS_ON) Battery Supply: 6 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_SLEEPING_REPORTING)

Node Type	0x00 [ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x0C07 [ICON_TYPE_SPECIFIC_SENSOR_NOTIFICATION_HOME_SECURITY]
User Icon Type	0x0C07 [ICON_TYPE_SPECIFIC_SENSOR_NOTIFICATION_HOME_SECURITY]

Mark:

1. When include to the network using USB power, the role type of the product is Always On. Changing to battery power will keep the role type in its network, which is also a Always On Slave.
2. When powered by batterry and include to the network, the role type of the product is Reporting Sleeping. Changing to USB power supply will keep the role type in its network, which is also Reporting Sleeping Slave.
3. After switching the power supply mode within the network, it needs to be excluded and re included to the network before it can take effect.

4.5 Manufacturer Specific

Parameter	Value
Manufacturer ID	0x046D
Product Type ID	0x2A94
Product ID	0x1A33

4.6 Version

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x07
Z-Wave Protocol Sub Version	0x17
Firmware 0 Version	0x01 [Z-Wave Chip Firmware Version]
Firmware 0 Sub Version	0x00 [Z-Wave Chip Firmware Sub Version]
Hardware Version	0x46 (70)
Number of firmware targets	0x00

4.7 Association Group Info

Root product

ID	Name	Node count	Profile	Function
1	Lifeline	5	General: Lifeline (0x0001)	**Device Reset Locally Notification:** Issued when Factory Reset is performed. **Battery Report:** Issued when battery becomes low. **Sensor Binary Report:** See Param1 for more information. **Notification Report** See Notification Chapter for more information
2	Motion	5	Notification: home Security (0x7107)	**Basic Set:** Control devices when motion trigger or untriggert

4.8 Notification

Notification Type		Notification Events		Description
Home Security	0x07	Motion detection	0x08	Motion detection
		State idle	0x00	Going to idle
Power Management	0x08	State Idle	0x00	Issued when replace new battery that battery power more than 90%.
		Power has been applied	0x01	Power has been applied
		AC mains disconnected	0x02	Supply by battery

		AC mains re-connected	0x03	Supply by USB
		Replace battery now	0x0B	Issued when battery level is less than the value of configuration parameter 26

4.9 Binary Sensor

Sensor Type		Sensor Value	Description
Motion	0x0C	0x00/0xFF	Motion State

4.10 Wake Up

Parameter	Value	Time
Min Wake Up Interval Seconds	0x000E10	3600s [1 hour]
Max Wake Up Interval Seconds	0xEFF100	15724800s [182days]
Default Wake Up Interval Seconds	0x093A80	604800s [1 week]
Wake Up Interval Step Seconds	0x0000F0	240s [4 minutes]

4.11 Battery

1. The 2.90V or more battery voltage corresponds to 100% battery level, and 2.60V or less corresponds to 0%.
2. If send Battery Get to the device, it will issue Battery Report with battery level to the requester when waked up.
3. If waked up or power on, it will detect battery level, and issue Battery Report via Lifeline when battery level change over 5%.
4. If waked up or power on, it will detect battery level, and issue Battery Report 0xFF via Lifeline when battery level is less than the value of configuration parameter 26.

4.12 Indicator

Indicator ID		Property ID	
Node Identify (Green Led)	0x50	On Off Period	0x03
		On Off Cycles	0x04
		On time within an On/Off period	0x05

4.13 Configuration

Parameter	0x01 (01)							
Name	Set the mode of motion report							
Info	For motion state							
Properties	Size		1		Min Value		0x00	
	Format		Bit field		Max Value		0x03	
	Read-only		False		Default Value		0x00	
	Altering capabilities		False		Advanced		False	
Description	Backwards compatibility, Binary Sensor for motion state							
	7	6	5	4	3	2	1	0

	reserve	Enable sends Motion Retrigger Notification Report.	Enable. Sends Sensor Binary Report.

Parameter	0x02 (02)			
Name	Motion Retrigger Time			
Info	Motion re-detection time			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	3600
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Timeout configuration set in second for motion sensor re-detection.			
	Value	Function		
	0~8	8 seconds (Hardware determines the time for re triggering)		
	9~3600	Timeout set in seconds		

Parameter	0x03 (03)			
Name	Motion Untrigger Time			
Info	Motion event release delay time			
Properties	Size	2	Min Value	30
	Format	Unsigned Integer	Max Value	3600
	Read-only	False	Default Value	240
	Altering capabilities	False	Advanced	False
Description	Timeout configuration set in second for motion sensor to send no motion status.			
	Value	Function		
	30~3600	Timeout set in seconds		

Parameter	0x04 (04)
Name	Motion sensitivity

Info	Sensitivity of motion sensor			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	11
	Read-only	False	Default Value	11
	Altering capabilities	False	Advanced	False
Description	0 - Motion sensor is disable. 1 - Minimum Sensitivity. 11 - Maximum Sensitivity.			

Parameter	0x05 (5)			
Name	Motion Group Control Group2			
Info	Motion Group Control Group2			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	6
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Set control of other devices on group2 based on motion trigger			

Value	Function
0	Send BASIC_SET (0xFF) when motion is triggered. 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 7) when motion is triggered to associated devices. Send BASIC_SET (value is configured by parameter 7) when motion is untriggered.

Parameter	0x07 (7)			
Name	Motion Group Value Setting			
Info	Motion Group Value Setting			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	0xFFFF
	Read-only	False	Default Value	0xFF00
	Altering capabilities	False	Advanced	False
Description	E.g. value=0x0A00, then BASIC_SET(0x0A) will be sent when motion trigger, BASIC_SET(0x00) will be sent when motion untrigger.			

Parameter	0x08 (8)			
Name	Low battery threshold			
Info	Low battery threshold			
Properties	Size	1	Min Value	10
	Format	Unsigned Integer	Max Value	90
	Read-only	False	Default Value	20
	Altering capabilities	False	Advanced	False
Description	This parameter lets you configure the percentage at which the device sends a low battery report. When the battery level drops below this set value, a notification is sent, along with a battery report.			
	Value	Function		
	0	Disable		
	10-90	10-90%		

Parameter	0x09 (9)			
Name	Report Indicator			
Info	Report Indicator			
Properties	Size	2	Min Value	0
	Format	Unsigned Integer	Max Value	0x0999

	Read-only	False	Default Value	0x0240
	Altering capabilities	False	Advanced	False
Description	This parameter allows the user to change the report color of the motion sensor. 0: Disabled 1: Red 2: Green 3: Blue 4: Yellow 5: White 6: Purple 7: Orange 8: Pink 9: Cyan			

12~15 bit	8~11 bit	4~7 bit	0~3 bit
Reserve	Detection Motion Report	Wake up interval report	Periodic Report:(Battery)

Parameter	0x0A (10)			
Name	Periodic Reports			
Info	Periodic Reports			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	2678400
	Read-only	False	Default Value	43200
	Altering capabilities	False	Advanced	False
Description	The period of battery report, the minimum time is 30 seconds.			

Value	Function
0	Disable
1~2678400	Seconds (If 1 - 30, set value to 30)