

Flood Sensor Manual

Version	Written By	Date	Change List
1.0	Yongqi	20170704	Initial
1.1	Yongqi	20170824	Add “Wakeup” and “Product Test Mode” Operation
1.2	Yongqi	20170901	Modify Some Command Classes Version Number
1.3	Yongqi	20171120	Add “Send Nodeinfo” Method
1.4	Yongqi	20171201	Modify the description for the Command Classes List in NIF.
1.5	Yongqi	20180130	Remove S0 Supported
1.6	Yongqi	20180228	Modify the description for SmartStart

The Water Leakage Detector is a Z-Wave™ enabled device and is fully compatible with any Z-Wave™ enabled network. Z-Wave™ enabled devices displaying the Z-Wave™ logo can also be used with it regardless of the manufacturer, and ours can also be used in other manufacturer's Z-Wave™ enable networks.

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.

Z-Wave™ Network Inclusion/Exclusion/Reset

Remove the sensor casing, there is one button on the top side of PCB board, it can be executed inclusion, exclusion and reset from Z-Wave™ network.

Add ¹	<ol style="list-style-type: none"> 1、 Power up the device. 2、 Set Z-Wave™ Controller into inclusion mode 3、 Press the button 3 times within 1s to enter inclusion mode. 4、 The device will be recognized and automatically included into Z-Wave™ Network. 	Led light will be blinked with 1s interval until inclusion successful.
Remove	<ol style="list-style-type: none"> 1、 Power up the device. 2、 Set Z-Wave™ Controller into exclusion mode 3、 Press the button 3 times within 1s to enter exclusion mode 	Led light will be blinked 3 times with 0.5s interval.
Factory Reset ²	<ol style="list-style-type: none"> 1、 Power up the device. 2、 Press and hold the button for 10s until led light is on, then release the button. 	Reset successfully, led light will be Blinked 5 times.
Wakeup	<ol style="list-style-type: none"> 1、 Press the button briefly. 	Led will blink once.
Product Test Mode	<ol style="list-style-type: none"> 1、 Press and hold the button. 2、 Power on the device, device will enter factory product test mode 	Led will blink with 100ms interval.
Send NodeInfo	Press the button 3 times within 1s	

Notice 1: When device enters into inclusion mode, the device all functionality will be useless. The inclusion mode will be timeout after 30s, user can press the button 3 times within 1.5s to terminate inclusion mode.

Notice 2: Factory Reset will clear the device all Z-Wave™ Network data (include home id, node id, etc...) saved in memory, and restore all configuration parameters to factory default. Please use this procedure only when the network primary controller is missing or otherwise inoperable.

Association

The device supports 2 association groups, and each 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.

Group 2 is controlling group, all nodes associated in this group will be controlled through BASIC_SET command by the device when device detects a water leakage event.

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

Group	Command Class	Event
1 (Lifeline)	COMMAND_CLASS_NOTIFICATION	NOTIFICATION_REPORT
	COMMAND_CLASS_SENSOR_BINARY	SENSOR_BINARY_REPORT
	COMMAND_CLASS_BATTERY	BATTERY_REPORT
	COMMAND_CLASS_DEVICE_RESET_LOCALLY	DEVICE_RESET_LOCALLY_NOTIFICATION
2 (Control)	COMMAND_CLASS_BASIC	BASIC_SET

Z-Wave™ Message Report

Once the device detects a water leakage event, it will report the event to the controller.

In default, device will use COMMAND_CLASS_NOTIFICATION to represent the water leakage event. User can also enable COMMAND_CLASS_SENSOR_BINARY report by setting the “Configuration No.9” to ‘1’.

Notice 1: If device is not added in any Z-Wave network, it will be beep alarm always until battery is running down, and the parameter settings (Configuration Parameter 1 to 4) are invalid.

Water Leakage Report

When device detects a water leakage event, it will automatically send the notification report to nodes associated in lifeline.

Command Class	COMMAND_CLASS_NOTIFICATION
Command	NOTIFICATION_REPORT
Type	WATER_ALARM (0x05)
Event	WATER_LEAK_DETECTED_UNKNOWN_LOCATION (0x02) WATER_ALARM_NO_EVENT (0x00)
Command Class	COMMAND_CLASS_SENSOR_BINARY
Command	SENSOR_BINARY_REPORT
Type	WATER
Event	DETECTED (0xFF) / NO-DETECTED (0x00)

Command Class Configuration

The device supports the controller to configure parameters of the device through Configuration Command Class, and the device has 11 parameters available for users to set according to their different needs:



Fig.1 Alarm Time Setting Figure

1) Alarm Duration Time

This configuration can be used to adjust the time for beep and LED turned on when water leakage is detected. If this configuration is set to '0', the beep and LED will be turn on always until water leakage is not detected. Refer to Figure 1. Unit: min (Minute).

Parameter Number	Size (Byte)	Available Settings	Default value
1	1	0 ~ 120	120

2) Alarm Interval Time

This configuration defines beep on /off interval time when water leakage is detected. Refer to Figure 1. Unit: s (Second).

Parameter Number	Size (Byte)	Available Settings	Default value
2	1	5 ~ 120	60

3) First Alarm On Time Duration

This configuration defines beep on duration first time when water leakage is detected. Refer to Figure 1. Unit: s (Second).

Parameter Number	Size (Byte)	Available Settings	Default value
3	1	10 ~ 120	60

4) Alarm on Time Duration

This configuration defines beep on duration after first beep on when water leakage is detected. Refer to Figure 1. Unit: s (Second).

Parameter Number	Size (Byte)	Available Settings	Default value
4	1	5 ~ 120	5

5) Water Leakage Detected Disable

This configuration sets to '0' will disable the water leakage detected function.

Parameter Number	Size (Byte)	Available Settings	Default value

5	1	0, 1	1
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6) Beep Alarm Disable

This configuration sets to '0' will disable the beep alarm on when device detects water leakage event.

Parameter Number	Size (Byte)	Available Settings	Default value
6	1	0, 1	1

7) Led Light Alarm Disable

This configuration sets to '0' will disable the Led indicating when device detects a water leakage event.

Parameter Number	Size (Byte)	Available Settings	Default value
7	1	0, 1	1

8) Basic Set Level

This configuration sets the level for device sending BASIC_SET to nodes that associated in group 2 when device detects a water leakage event.

[0] – Off, BASIC_SET = 0x00, all nodes associated in group 2 will be off.

[1 ... 99] – On. BASIC_SET = [Setting Value].

[100] – On, BASIC_SET = 0xFF.

Parameter Number	Size (Byte)	Available Settings	Default value
8	1	0 ~ 100	100

9) Sensor Binary Report Enable

This parameter sets to '1' will enable SENSOR_BINARY_REPORT when device detects a water leakage event. This is for Z-Wave protocol backward compatibility.

Parameter Number	Size (Byte)	Available Settings	Default value
9	1	0, 1	0

10) Battery Report Periodically Enable

This parameter sets to '1' will enable reporting battery periodically. The period time is defined by configuration parameter 11.

If this value set to '0', battery report will be executed in two cases listed as below.

1, Device is power up.

2, Battery life is falling 100, 16 and 0

Parameter Number	Size (Byte)	Available Settings	Default value
10	1	0, 1	0

11) Battery Report Interval

This parameter is defined the interval time for battery report. This value is larger, the battery life is longer.

Unit: Minute.

Parameter Number	Size (Byte)	Available Settings	Default value(m)
11	2	1 ~ 1080	480

Wakeup Command Class

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

The minimum wakeup interval is 1800s (30 minutes)

The maximum wakeup interval is 64800s (18 Hours)

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

Note: The default value is 8 hours with factory default. This value is greater, the battery life is longer.

Battery Command Class

The users can also enquire the battery status of the device by sending BATTERY_GET command. Once the device receives the command, it will return BATTERY_REPORT command.

The device will send BATTERY_REPORT = 0xFF command to the Z-Wave™ Controller to inform that the device is in dead battery status, otherwise BATTERY_REPORT value range is from 0% to 100%.

Command Class Basic

The COMMAND_CLASS_BASIC is realized to control the devices associated in group 2 in this water detector.

When water detector detects a water leakage event occurred, it will send a “BASIC_SET = [Value]” command to control the devices in group 2.

And it will send a “BASIC_SET = 0x00” command to control the devices in group 2 after the water leakage event is cleared.

The [Value] is set by configuration No.8.

Smart Start

This device supports Smart Start function. QR code printed by laser can be found on surface of product and the outside of packing box. And the full DSK code is printed can be found on the packing box.

The device will enter Smart Start if the device is not included in network after power up. And if device is not included successfully during 10 second, it will enter sleep mode. And then

2nd Smart Start time delay approximately 16s

3rd Smart Start time delay approximately 32s

4th Smart Start time delay approximately 64s

5th Smart Start time delay approximately 128s

6th Smart Start time delay approximately 256s

7th Smart Start time delay approximately 512s

Afterwards, the Smart start mode will be auto running with 512 second interval until device is included successfully or battery run down.

Led Action Indicator

LED Color	Led Display Status	Description
Red	Blink 5 Times(300ms Interval)	Power on and Already Add in a Z-Wave Network
	Blink 3 Times(500ms Interval)	1, Press button tripled, device sends Node Info. 2, Press button tripled, device enters into exclusion mode.
	1, Blink with 1s interval and then 2, blink 15 times with 2s interval	Press button tripled, device enters into inclusion mode. Device assigned a node id and wait for configuration completed.
	Light On 150ms	Press the button briefly, device send a wakeup information to controller
	Light On In Step With Beep Alarm	Detect a water leakage event
	Light On 500ms	Hold pressed the button and factory reset.

Security Network

The device supports the security function with 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 follow commands must use security and security_2 command class wrapped to communicate, otherwise the device will not response any commands.

Security Keys

This device supports security levels are listed in below table:

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

All Supports Command Class

This device supports All Z-Wave Command Classes in NIF List as follows:

- * COMMAND_CLASS_ZWAVEPLUS_INFO (V2)
- * COMMAND_CLASS_SECURITY_2 (V1)
- * COMMAND_CLASS_TRANSPORT_SERVICE (V2)
- * COMMAND_CLASS_VERSION (V2)
- * COMMAND_CLASS_POWERLEVEL (V1)
- * COMMAND_CLASS_ASSOCIATION (V2)
- * COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION (V3)
- * COMMAND_CLASS_ASSOCIATION_GRP_INFO (V1)
- * COMMAND_CLASS_MANUFACTURER_SPECIFIC (V2)
- * COMMAND_CLASS_DEVICE_RESET_LOCALLY (V1)
- * COMMAND_CLASS_BATTERY (V1)
- * COMMAND_CLASS_WAKEUP (V2)
- * COMMAND_CLASS_NOTIFICATION (V8)
- * COMMAND_CLASS_SENSOR_BINARY (V2)
- * COMMAND_CLASS_CONFIGURATION (V1)
- * COMMAND_CLASS_SUPERVISION (V1)

All Security Command Class in Security Network

The Z-Wave Command Classes are secured in security network as follows:

- * COMMAND_CLASS_VERSION (V2)
- * COMMAND_CLASS_POWERLEVEL (V1)
- * COMMAND_CLASS_ASSOCIATION (V2)
- * COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION (V3)
- * COMMAND_CLASS_ASSOCIATION_GRP_INFO (V1)
- * COMMAND_CLASS_MANUFACTURER_SPECIFIC (V2)
- * COMMAND_CLASS_DEVICE_RESET_LOCALLY (V1)
- * COMMAND_CLASS_BATTERY (V1)
- * COMMAND_CLASS_WAKEUP (V2)
- * COMMAND_CLASS_NOTIFICATION (V8)
- * COMMAND_CLASS_SENSOR_BINARY (V2)
- * COMMAND_CLASS_CONFIGURATION (V1)

Non-Secure Command Class in Secure Network

Unsecure Command Class which included in a secure Z-Wave Network is listed in unsecure node information.

- * COMMAND_CLASS_ZWAVEPLUS_INFO (V2)
- * COMMAND_CLASS_SECURITY_2 (V1)
- * COMMAND_CLASS_TRANSPORT_SERVICE (V2)
- * COMMAND_CLASS_SUPERVISION (V1)

Specifications

Power Supply	CR14250 × 1
Standby Current	2uA
Work Current(RF Tx)	Up to 36mA
Operational Temperature	0 - 70°C
Communication frequency	868.40MHz, 869.85MHz (EU) 908.40MHz, 916.00MHz(US)
Range	Up to 45m indoors (depending on the building structure), and 80m for outdoor open fields. Up to 60m outdoors.