



SmokeShield

(ZWA050)



Engineering Specification

SmokeShield

Document No.	SPEC-ZWA050
version	1.0
Description	<p>This document mainly introduces the new generation AEOTEC SmokeShield. The content mainly includes its interfaces, accessories, features, specifications, quick start, and software function definition.</p> <p>SmokeShield is a Z-Wave Plus[®] v2 device with many advantages.</p> <ul style="list-style-type: none">● Used to send out notification via Group 1 (Lifeline) when smoke is detected.● Used to connected with other sensors to serve as an extra siren● Used to control other Z-Wave[®] device directly via Group 2.● Support SmartStart, which makes inclusion more convenient.● Support S2, which makes it more secure and reliable.
Written By	
Date	
Reviewed By	
Date	
Approved By	
Date	

REVISION RECORD		
Version	Date	Brief description of changes
0.1	2024.08.26	First revision.
0.2	2024.11.19	Update function
0.3	2025.02.06	Change battery information
0.4	2025.04.17	Modify user behavior interaction and add notification event
1.0	2025.05.25	Update function

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1 INTERFACES & ACCESSORIES

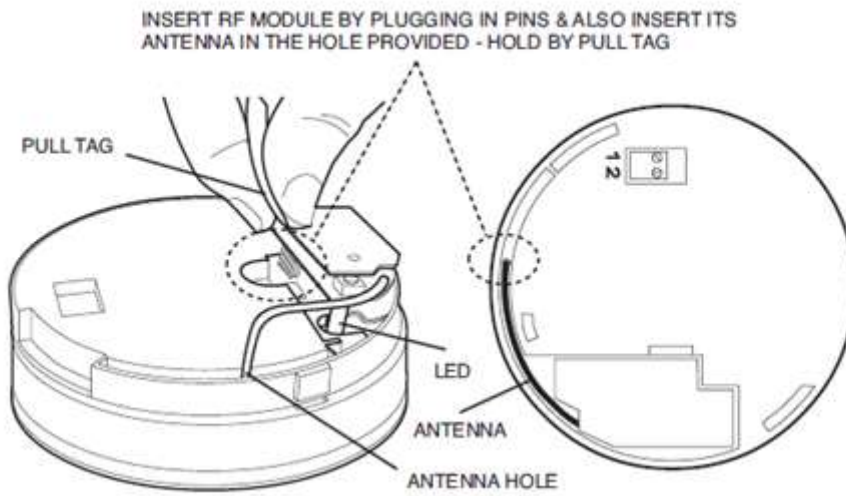


Figure 1

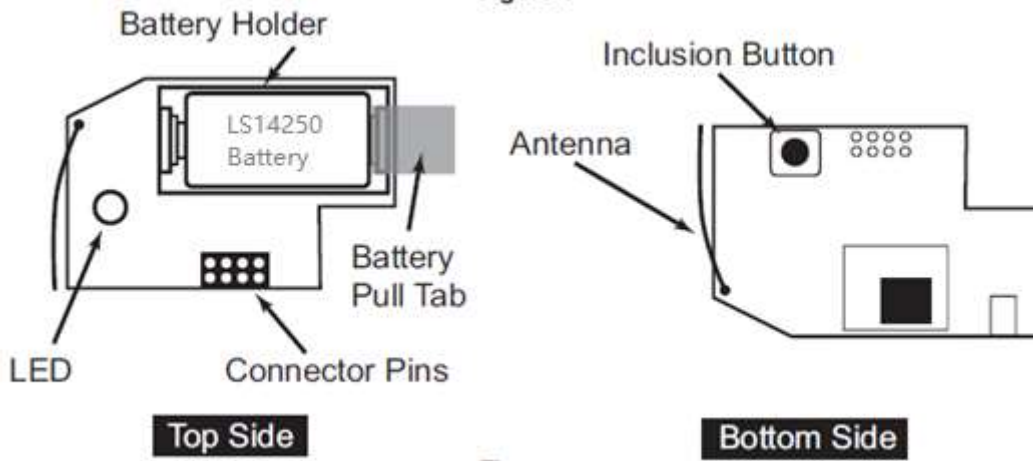


Figure 1

2 FEATURES & SPECIFICATIONS

2.1 Structural Characteristics

Parameter	Value
Product Identifier	ZWA050
Dimensions	115x115x47mm
Weight	202g
Color	White
Shell Material	UV-resistant plastic
Installation type	Ceiling mounting
Operating Temperature	5°C to 40°C
Relative Humidity	20%~80%

2.2 Hardware Characteristics

Parameter	Value
Z-Wave Module	EFR32ZG23
Z-Wave TX Power	Max: 14dBm
Z-Wave Antenna Distance	40m (Indoor) /150m (Outdoor)
Indicator Light Color	Green
Buttons and Connectors	Action Button
Battery Info	LS14250 x 1pcs
Built-in Sensors	Smoke Sensor

2.3 Software Characteristics

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	ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_SLEEPING_REPORTING (0x06)
Generic Device Type	GENERIC_TYPE_SENSOR_NOTIFICATION (0x07)
Specific Device Type	SPECIFIC_TYPE_NOTIFICATION_SENSOR (0x01)
Security Class	Non-Security, S2 Unauthenticated, and S2 Authenticated
SmartStart Compatible	Support.
Over The Air (OTA)	Support. Firmware can be updated via RF.
Multi Channel Device	No
Association	Support. Refer to Section 4.7 Association Group Info.
Factory Reset	Support. Refer to Section 3.5 How to factory reset.
Power-down Memory	Support. All command settings will stay unchanged even power down.
Timed battery report	Support. Refer to Configuration Parameter 111.
Sensor State Report	Support. When smoke is detected, send out notification via Group 1.
Control other device	Support. When smoke is detected, control other Z-Wave device directly via Group 2.

3 PRODUCT QUICK START

3.1 Important safety information

Please read this Engineering Specification carefully for correct and effective use.

Failure to follow the recommendations set forth by AEOTEC Limited may be dangerous or cause a violation of the law. The manufacturer, importer, distributor, and/or reseller will not be held responsible for any loss or damage resulting from not following any instruction in this guide or in other materials.

SmokeShield is intended for indoor use in dry locations only. Do not use in damp, moist, and /or wet locations. Contains small parts; keep away from children.

3.2 Quick Installation Guidelines

Please refer to the installation guide of the Ei650 Alarm for information about how and where the Smoke Alarm should be installed. Please note that the Smoke Alarm will also work stand-alone even if the Z-Wave network is not present.

- The first step is to mount the mounting base in the desired location as per the installation guide for the Smoke Alarm.
- Unplug the module from the Alarm & remove the battery Pull Tab from the wireless module (see Figure 1). The green LED will blink briefly
- Plug the module into the Alarm (see Figure 1).
- Place the Alarm on the mounting base and turn clockwise. Now the Alarm is armed.

NOTE: SmokeShield is a retrofittable Shield for 10year Ei Electronics Smoke Sensors. The Smoke Sensor needs to be purchased separately. SmokeShield only works with the following models:

Ei Electronics Ei650iW

Ei Electronics Ei650i

3.3 How to add the product into Z-Wave network

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 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.

3.3.1 SmartStart Learn Mode

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 after this product being powered on in the network vicinity. You can find the QR code on the bottom of the product, like this:



PIN: 05065

The DSK information will be like this: 05065-41336-16018-47313-50335-02212-29424-38760

3.3.2 Classic Inclusion Learn Mode

1. Set your Z-Wave Controller into its 'Add Device' mode in order to add the product into your Z-Wave system. Refer to the Controller's manual if you are unsure of how to perform this step.
2. Make sure the product is powered. its LED will be breathing light for 10 seconds.
3. Quickly click Action Button twice, it will quickly flash light for 30 seconds until it is added into the network. Led will on for 10 seconds after being assigned a NodeID.
4. If your Z-Wave Controller supports S2 encryption, enter the first 5 digits of DSK into your Controller's interface if /when requested. The DSK is printed on its housing.
5. If Adding fails, it will come back to breathing light; repeat steps 1 to 4. Contact us for further support if needed.
6. If Adding succeeds, it will turn to light. Now, this product is a part of your Z-Wave home control system. You can configure it and its automations via your Z-Wave system; please refer to your software's user guide for precise instructions.

Note:

If Action Button is clicked again during the Classic Inclusion Learn Mode, the Classic Inclusion Learn Mode will exit. At the same time, Indicator Light will become breathing light.

3.4 How to remove the product from Z-Wave network

1. Set your Z-Wave Controller into its 'Remove Device' mode in order to remove the product from your Z-Wave system. Refer to the Controller's manual if you are unsure of how to perform this step.
2. Make sure the product is powered.
3. Quickly click Action Button twice.
4. If Removing fails, it will turn back to constantly light; repeat steps 1 to 3. Contact us for further support if needed.
5. If Removing succeeds, it will become breathing light. Now, it is removed from Z-Wave network successfully.

3.5 How to factory reset

If the primary controller is missing or inoperable, you may need to reset the device to factory settings.

Make sure the product is powered. To complete the reset process manually, press and hold the Action Button for at least 12s. The Indicator Light will become breathing light, which indicates the reset operation is successful. Otherwise, please try again. Contact us for further support if needed.

Note:

1. This procedure should only be used when the primary controller is missing or inoperable.
2. Factory Reset will:
 - a) Remove the product from Z-Wave network;
 - b) Delete the Association setting;

3.6 Long Range

This product can be included using Z-Wave Long Range.

4 SOFTWARE FUNCTION DEFINITION

4.1 User Behavior Interaction

User behavior	Out of the Z-Wave network	In the Z-Wave network
Power ON	<p>SmartStart Learn Mode.</p> <p>Indicator Light will become flash light for 1s indicating the product has been powered, and then become breathing light. SmartStart Learn Mode starts after power on, and it will become flash light after a controller begin to response to its SmartStart inclusion request.</p> <p>If Adding succeeds, it will bright light for 2s and become regular light mode (constantly light or off).</p> <p>If Adding fails, it will turn back to breathing light and then start SmartStart Learn Mode again.</p>	<p>Send Wake Up Notification Report and stay awake for 10 Sencond unless put to sleep by Wake Up No More Information frame</p>
Click Action Button once	<p>1.Exit Classic Inclusion Learn Mode.</p> <p>2.Exit Test Mode</p> <p>3.Indicate network status</p> <p>The led breathing 3 times and then turn off.</p>	<p>1.Exit Classic Inclusion Learn Mode.</p> <p>2.Exit Test Mode</p> <p>3.Send Wake Up Notification</p> <p>led will on for 1 second, and device will wake up for 10 seconds(if received wakeup no more information, will go to sleep immediately).</p>
Quickly Click Action Button twice	<p>1. Send Node Info for Adding.</p> <p>LED will blink green for 30s until it is added into the network.</p> <p>If Adding succeeds, LED will light up for 2 seconds</p> <p>If Adding fails, LED will turn off. Device will auto-reset and then</p>	<p>1. Send Node Info for Removing.</p> <p>LED will blink for 30 seconds until it is removed from the network.</p> <p>If Removing succeeds, LED will light up for 2 seconds and become breathing light 3 times.</p>

	<p>activate SmartStart Learn Mode again.</p> <p>2.Exit Classic Inclusion Learn Mode:</p> <p>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.</p>	<p>If Removing fails, LED will light up red for 1 seconds and turn off</p> <p>2.Exit Classic exclusion Learn Mode:</p> <p>If Z-Wave button is clicked again during the Classic exclusion Learn Mode, the Classic Learn Mode will exit. LED will turn off.</p>
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]	<p>Green light on 100%</p> <p>Test alarm sound.</p> <p>Indicator Light will become flash fast when press, and the buzzer will sound for 5 seconds when release.</p>	<p>Green light on 100%</p> <p>Test alarm sound.</p> <p>Indicator Light will become flash fast when press, and the buzzer will sound for 5 seconds when release.</p>
Press and hold Z-Wave button for (5, 12s]	Green Led will accelerate Falsh.	Green Led will accelerate Falsh.
Press and hold Action Button for [12, ∞)	<p>Factory Reset And Restart</p> <p>Led will become constantly light for 1 second, and become breathing light indicates the reset is success.</p>	<p>Factory Reset AND Restart.</p> <p>Led will become constantly light for 1 second, and become breathing light.</p> <p>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.</p>

4.2 Supported Command Classes

Command Class	Version	Securely added	
		Non-secure CC	Secure CC
ZWAVEPLUS_INFO (0x5E)	2	Support	
ASSOCIATION (0x85)	2		Support
MULTI_CHANNEL_ASSOCIATION (0x8E)	3		Support
ASSOCIATION_GRP_INFO (0x59)	3		Support
TRANSPORT_SERVICE (0x55)	2	Support	
VERSION (0x86)	3		Support
MANUFACTURER_SPECIFIC (0x72)	2		Support
DEVICE_RESET_LOCALLY (0x5A)	1		Support
INDICATOR (0x87)	3		Support
POWERLEVEL (0x73)	1		Support
BATTERY (0x80)	1		Support
SECURITY_2 (0x9F)	1	Support	
NOTIFICATION (0x71)	8		Support
CONFIGURATION (0x70)	4		Support
Binary Sensor (0x30)	2		Support
SUPERVISION (0x6C)	1	Support	
FIRMWARE_UPDATE_MD (0x7A)	5		Support
WAKE_UP (0x84)	2		Support

4.3 Z-Wave Plus Info

Parameter	Value
Z-Wave Plus Version	2
Role Type	0x06 (Sleeping Reporting Node)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x0C01 (SENSOR_NOTIFICATION_SMOKE_ALARM)
User Icon Type	0x0C01 (SENSOR_NOTIFICATION_SMOKE_ALARM)

4.4 Manufacturer Specific

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_TYPE_ID_SENSOR)
Product ID 1	0x00
Product ID 2	0x32=50

4.5 Version

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x07
Z-Wave Protocol Sub Version	0x17
Firmware 0 Version	Software Version MSB
Firmware 0 Sub Version	Software Version LSB
Hardware Version	0x32=50
Number of firmware targets	0x00

4.6 Association group Info

ID	Name	Node count	Profile	Function
1	Lifeline	10	General: Lifeline (0x00, 0x01)	Device Reset Locally Notification(0x5A01): Issued when Factory Reset is performed. Battery Report(0x8003): Issued periodically to report the battery level; Issued when battery becomes low. Notification Report(0x7105): Issued when notification event is detected Sensor Binary Report (0x3003) Issued when smoke or Tamper is detected(enable by configuration 80)
2	Smoke Action	10	Notification: Smoke alarm (0x71, 0x01)	Basic Set (0x2001) Issued when smoke statue is changed.
3	Smoke Alarm	10	Notification: Smoke alarm (0x71, 0x01)	Notification Report(0x7105): Issued when Smoke is detected Sensor Binary Report (0x3003) Issued when smoke or Tamper is detected(enable by configuration 80)

4.7 Notification

Notification Type	Notification Event	Function
Smoke Alarm (0x01)	Idle (0x00)	no smoke.
	Smoke detected (0x02)	Smoke detected.
	Smoke alarm test (0x03)	Smoke Test Button press
	Replacement required, End-of-life (0x05)	Head battery alarm
Home Security (0x07)	State Idle (0x00)	Head is mounted from mounting plate
	Tampering (0x03)	Head is unmounted from mounting plate

System (0x09)	State Idle (0x00)	State idle
	System Hardware Failure (0x01)	End of life, fault or low battery is detected on the Ei Head

4.8 Sensor Binary

Sensor Type	Sensor Value	Function
Smoke (0x02)	0x00 / 0xFF	Current Smoke Alarm Status
Tamper (0x08)	0x00 / 0xFF	Current Tamper Alarm Status

4.9 Wake up

1. Wake Up Interval Capabilities Report

Parameter	Value	Time
Min Wake Up Interval Sencods	0x000E10	3600s (1 hour)
Max Wake Up Interval Sencods	0xEFF100	15724800s (182 days)
Default Wake Up Interval Sencods	0x015180	86400s (24 hours)
Wake Up Interval Step Seconds	0x000E10	3600s (1 hour)

2. Manual Wake Up triggered by a user activation

When re-power on and smoke statue is changed, Wake Up Notification will be issued, and the Wake Up destination is according to the Wake Up Interval Set. The Wake Up period starts when the supporting node issues a Wake Up Notification and it ends either 10 seconds after the last received/transmitted frame or at the reception of a Wake Up No More Information Command by the Wake Up destination.

If press and hold the Action Button for 2s and release the Action Button when the LED becomes solid, Wake Up Notification will also be issued, and the Wake Up destination is according to the Wake Up Interval Set. It will stay awake for 10 seconds after issuing Wake Up Notification, or goes into sleep immediately if receives Wake Up No More Information.

4.10 Battery

1. If send Battery Get to the device, it will issue Battery Report with current battery level to the requester when waked up.
2. If re-power on, it will issue Battery Report with current battery level via Lifeline.
3. If waked up, it will detect battery level, and issue Battery Report via Lifeline when battery is changed. If the battery is low (i.e. less than 20%), a low battery report will be sent.
4. The battery voltage above 3.1V corresponds to 100%, and 2.6V corresponds to 0%.

4.11 Indicator

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

4.12 Configuration

Note: It will reset all its configuration parameters if either manually reset to factory default or receives a Configuration Default Reset Command. It will NOT modify or reset any configuration parameter when being included or excluded of a Z-Wave network.

Parameter	0x01 (1)			
Name	Enable/disable basic set			
Info	Enable/disable basic set to group 2			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	2
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Enable or disable basic set to group 2			
	Value	Function		
	0	Basic On & Basic OFF enabled		
	1	Basic On enabled		
	2	Basic OFF enabled		

Parameter	0x02 (2)	
Name	Value of On-Command	
Info	What value of Basic Set On to group 2	

Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	0xFF
	Read-only	False	Default Value	0xFF
	Altering capabilities	False	Advanced	False
Description	Configure what value of Basic Set On to group 2			

Parameter	0x03 (3)			
Name	Value of Off-Command			
Info	What value of Basic Set Off to group 2			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	0xFF
	Read-only	False	Default Value	0x00
	Altering capabilities	False	Advanced	False
Description	Configure what value of Basic Set Off to group 2			

Parameter	0x04 (04)			
Name	Low battery threshold			
Info	Configure the low battery threshold			
Properties	Size	1	Min Value	0
	Format	Unsigned Integer	Max Value	50
	Read-only	False	Default Value	20
	Altering capabilities	False	Advanced	False
Description	Report low battery report when level goes under threshold setting			
	Value	Function		
	0-50	0-50%		

Parameter	0x50 (80)			
Name	Enable Binary Sensor report			
Info	Enable Binary Sensor report			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	1
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Enable Binary Sensor report			
	0	disable binary sensor report of group1 and group 3		
	1	enable binary sensor report of group1 and group 3		

Parameter	0x6F (111)			
Name	Timed detection			
Info	how often to check battery and header			
Properties	Size	4	Min Value	0
	Format	Unsigned Integer	Max Value	0x000D2F00 864000 (10 days)
	Read-only	False	Default Value	0x00015180 86400 (1 day)
	Altering capabilities	False	Advanced	False
Description	Set how often to check the battery level and Ei header status in second			
	Value	Function		
	0	Disable		
	10-14400	Time for detecting battery level and Ei header status in second.		

Parameter	0xFC (252)			
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Name	lock configuration setting			
Info	lock configuration setting			
Properties	Size	1	Min Value	0
	Format	Enumerated	Max Value	1
	Read-only	False	Default Value	0
	Altering capabilities	False	Advanced	False
Description	Enable/disable to lock configuration parameters			
	Value	Function		
	0	Disable		
	1	Enable.		