Engineering Specification

Doorbell 6

Document No.	SPEC-ZW162
Version	8
Description	This document mainly introduces AEOTEC new generation Doorbell 6. The content mainly includes its appearance, features, certifications, quick start, and software function definition. Doorbell 6 is a smart doorbell based on Z-Wave and 433.92MHz/FSK. ● Not only a doorbell, but also can be used as a siren via setting its modes. ● Supports pairing with 3 Buttons and can be controlled by 3 Buttons separately. ● Built-in multiple tones, up to 30. ● Designed as Multi Channel Device, including 1 Browse Endpoint, 3 Remote Endpoints, 2 Siren Endpoints, and 1 Instant Endpoint, which enhances its application scenarios.
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Date	

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Date	

REVISION RECORD				
Doc. Rev	Date	By	Pages affected	Brief description of changes
1	2018.10.26	Hiking	ALL	First revision
2	2018.10.29	Hiking	1, 19	● Section 1.1 Abstract: add description about security requirement and non-battery operated nodes within the network will act as repeaters. ● Add new Section 1.4 Quick start. ● Section 4.15 Configuration: modify the description of the value (0) about Play Control of Parameter 0x02/0x03, changing to “Set but not play”
3	2018.11.01	Hiking	18,19,20 22	● Modify the default Tone Index of Parameter 0x02~0x08 ● Parameter 0xFF: Add the precondition of ONLY reset to factory default setting, and the precondition is “ If Size=1, Default=1, Value=0 ”
4	2018.11.05	Hiking	All	● Move the Abstract info to the Home Page’s Description. ● Add new Chapter 1 TERMINOLOGY DEFINITION ● Add new Chapter 4 PRODUCT QUICK START, including ✧ How to add Chime into Z-Wave network ✧ How to remove Chime from Z-Wave network ✧ How to factory reset Chime ✧ How to factory reset Button ✧ How to install Chime ✧ How to install Button ✧ How to pair Button ✧ How to unpair Button ● Modify the process description about pairing and unpairing Button.
5	2018.11.06	Hiking	All	● Section 4.2: add description about security requirement and non-battery operated nodes within the network will act as repeaters. ● Modified some spelling and expression mistake. ● Add hyperlinks to facilitate quick jumps ● Modify “Keep the previous configuration” of Configuration Parameter 0x02/0x03, changing to “Use last valid configuration”
6	2018.11.07	Hiking	1 5 6 7 27	● Home Page: Add “Approved by” ● Chapter 1: Add the definition of “Ring Button” ● Chapter 2: Update the picture ● Chapter 3: Add “Indicator Light Power”, ”Tone Group Customization” ● Add new Chapter 6 SAFETY CERTIFICATION
7	2018.11.08	Hiking	All	● Modify Directory Outline ● Merge features and safety certification into the same Chapter ● Separate the appearance of the product as a page
8	2018.11.14	Hiking	Home Page	● Modify the encoding format of “Document No.” in Home Page, changing to “SPEC-Product Model”

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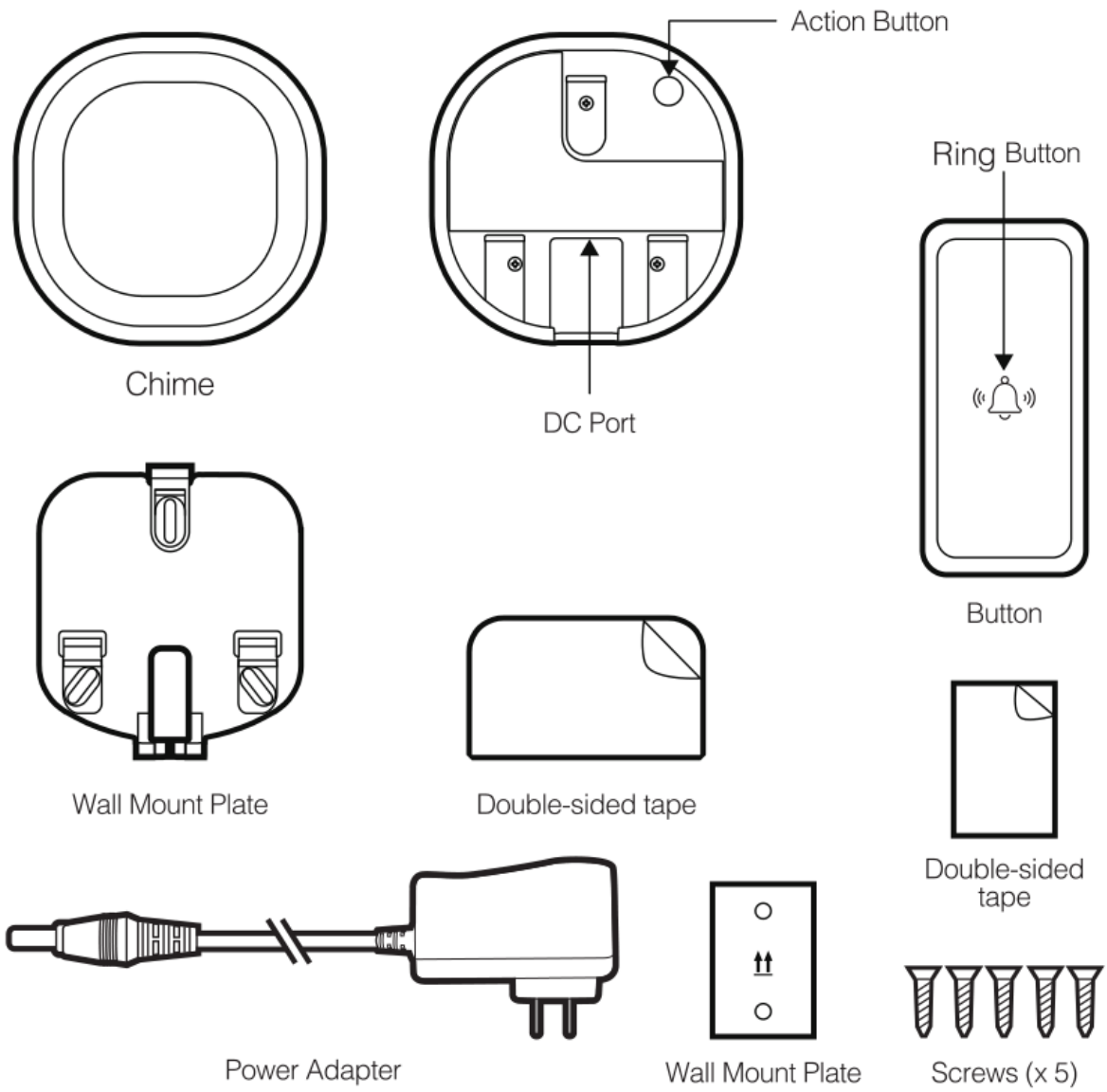
DOORBELL 6

1 INTERFACES & ACCESSORIES



Terminology	Description
Chime	A component based on Z-Wave and 433.92MHz/FSK technology, and it can be used to play tone when triggered by Z-Wave Command or paired Button. ● Please refer to Section 4.1 for details.
Button	A component based on 433.92MHz/FSK technology, and it can be used to wireless control Chime to play tone. ● Please refer to Section 4.3 for details.
Action Button	A button in Chime, and it can be used for networking, resetting, and pairing Button, etc. ● Please refer to Section 4.2 for details.
Ring Button	A button in Button, and it can be used for wireless controlling Chime to play tone. ● Please refer to Section 4.3 for details.

2 FEATURES & CERTIFICATIONS

2.1 Features

Parameter	Value
Product Identifier	ZW162
Dimensions	Chime: 76*76*38.5mm Button: 85*38*14mm
Weight	Chime: 100g Button: 35g
Color	Chime: White Button: White
Environmental Requirements	Operating temperature: 32° to 104° F (0° to 40° C) Relative humidity: 8% to 80%
Wireless Technology	Z-Wave (Between Chime and Gateway), 433.92MHz/FSK(Between Chime and Button)
Z-Wave Plus	Yes
Z-Wave Module	ZM5101
Z-Wave Version	6.71.03
Z-Wave Library Type	Enhanced 232 Slave
Z-Wave Device Type	Sound Switch
Z-Wave Role Type	Always On Slave
Security Class	Non-Security, S0, S2 Unauthenticated, and S2 Authenticated
Smart Start Compatible	No
Over The Air (OTA)	Yes
Multi Channel Device	Yes
Z-Wave Antenna Distance	30m (Indoor) /150m (Outdoor). Between Chime and Gateway.
Button Control Distance	120m (Barrier-free sight line distance). Between Chime and Button.
External Buttons and Connectors	DC Port (x1) Action Button (x1) Ring Button(x1)
Input Voltage	Chime: Battery, 3.7V; Power Adapter, DC 5V/2A Button: Battery, 3V
Battery	Chime's Battery: Model: PT502035 Capacity: 400mAh Detachable: No Chargeable: Yes. Charging via Chime Power Adapter. Endurance: 4 hours Button's Battery: Model: CR2450 Capacity: 630mAh Detachable: Yes Chargeable: No Endurance: 2 years
Power Consumption	Chime: I_{WORK} < 80mA, $I_{STANDBY}$ < 70mA Button: I_{WORK} < 20mA, $I_{STANDBY}$ < 0.1uA
Indicator Light Power	2W
Indicator Light Color Temperature	5500K
Splash, Water, and Dust Resistant	Chime: Not Waterproof Button: Rated IP55 under IEC standard 60529
Sensors	Vibration Sensor
Supported Paired Buttons	Max: 3
Tones Storage Size	16M
Supported Tones	Max: 30; Default: 30. No interface to replace the built-in tones. If want to change these built-in tones, you need to contact us to customize.
Volume	Max: 105dB from 10cm away; 7 adjustable levels
Tone Group	Include 1 Browse Group, 3 Remote Group, 2 Siren Group, and 1 Instant Group.

Tone Group Customization	Can custom different Tone Group Parameters with Configuration Set, including Tone Index, Play Control, Play Mode, Volume, Light Effect Index, Interval Between 2 tones, Continuous Play Count, Intercept The Length Of A Tone. Tone Name can't be customized by user.
In the Box	Chime (x1) Button (x1) Manual (x1) Screws (x5) Chime Power Adapter (x1; Line Length=1.5m) Chime wall mount plate (x1) Chime wall mount plate double-side tape (x1) Button wall mount plate (x1) Button wall mount plate double-side tape (x1)

2.2 Safety certifications

(1) Chime safety certification

Country	Certification Item	Certification Standard
America	FCC ID	FCC PART 15C
	FCC SDOC	FCC PART 15B
Europe	CE-EMC	EN55032,EN55035
	CE-RED	EN301489-1/-3 EN300220 EN62311
	CE-LVD	EN60950
	Battery	EN62133
Australia	RCM	AS/NZS CISPR 32 AS/NZS CISPR 4268 IEC60950

(2)Button safety certification

Country	Certification Item	Certification Standard
America	FCC ID	FCC PART 15C
Europe	CE-RED	EN301489-1/-3 EN300220 EN62311
	CE-LVD	EN60950
Australia	RCM	AS/NZS CISPR 4268

3 PRODUCT QUICK START

Terminology	Description
Inclusion	The process when a Z-Wave gateway is adding a Z-Wave device. ● Please refer to Section 3.2 & Section 4.1 for details.
Exclusion	The process when a Z-Wave gateway is removing a Z-Wave device. ● Please refer to Section 3.3 & Section 4.1 for details.
Pair	The process when a Chime is pairing a Button. ● Please refer to Section 3.8 for details.
Unpair	The process when a Chime is unpairing a Button. ● Please refer to Section 3.9 for details.
Tone Group	The function of Tone Group is closely related to Endpoint, and it can be user-defined, including Tone Index, Play Control, Play Mode, Volume, Light Effect Index, Interval Between 2 tones, Continuous Play Count, Intercept The Length Of A Tone. Tone Name can't be customized by user. ● Please refer to Section 4.1, 4.4 & 4.15(Configuration Parameter 0x02~0x08) for details.
Button Number	#1 Button is closely related to Chime Endpoint 2 and Configuration Parameter 0x21. #2 Button is closely related to Chime Endpoint 3 and Configuration Parameter 0x22. #3 Button is closely related to Chime Endpoint 4 and Configuration Parameter 0x23. ● Please refer to Section 3.8, 4.3 & 4.15(Configuration Parameter 0x21~0x24) for details.

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.

Doorbell 6 includes 2 separate components: **Chime** and **Button**. Chime is intended for indoor use in dry locations only. Do not use in damp, moist, and/or wet locations. Button offers IP55 water protection and is suitable for outdoor use without direct exposure to heavy and penetrative rain. Button is constructed with nylon; away from heat and do not expose to flame.

Warning:

To prevent possible hearing damage, test only when wearing appropriate hearing protection.

Contains small parts; keep away from children.

3.2 How to add Chime into Z-Wave network

Chime supports Security 2 Command Class. While a Security S2 enabled Controller is needed in order to fully use the security feature. Chime 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. Set your Z-Wave gateway into its 'Add Device' mode in order to add Chime into your Z-Wave system. Refer to the gateway's manual if you are unsure of how to perform this step.

2. Power on Chime via the provided power adapter; its LED will be breathing White light all the time.

3. Click Chime Action Button once, it will quickly flash White light for 30 seconds until Chime is added into the network. It will become constantly bright White light after being assigned a NodeID.

4. If your Z-Wave gateway supports S2 encryption, enter the first 5 digits of DSK into your gateway's interface if /when requested. The DSK is printed on Chime's housing.

5. If Inclusion fairs, it will slowly flash White light 3 times and then become breathing White light; repeat steps 1 to 4. Contact us for further support if needed.

6. If Inclusion succeeds, it will quickly flash White light 3 times and then become off. Now, Chime 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 network access process, the network access process will exit, at the same time the Indicator Light will extinguish immediately, and then become breathing White light.

3.3 How to remove Chime from Z-Wave network

1. Set your Z-Wave gateway into its 'Remove Device' mode in order to remove Chime from your Z-Wave system. Refer to the gateway's manual if you are unsure of how to perform this step.

2. Power on Chime via the provided power adapter; its LED will be off.

3. Click Chime Action Button 6 times quickly; it will bright White light, up to 2s.

4. If Exclusion fairs, it will keep off; repeat steps 1 to 3. Contact us for further support if needed.

5. If Exclusion succeeds, it will quickly flash White light 3 times and then become breathing White light. Now, Chime is removed from Z-Wave network successfully.

3.4 How to factory reset Chime

If something happens to Chime, you may want to factory reset it. There are two way:

- Long press Action Button more than 20s. Please refer to Section 4.2 for details.
- Sending Configuration Set. Please refer to Configuration Parameter=0xFF for details.

3.5 How to factory reset Button

There is no way to factory reset Button. If something happens to Button, please try to re-power it. Contact us for further support if needed.

3.6 How to install Chime

Chime and Button communicate wirelessly and can be installed up to 120 meters/393 feet apart. However, the wireless range is reduced by interference from competing wireless signals, doors, and walls. Before installing Chime, test your desired installation location for both Button and Chime first to ensure that a reliable wireless connection can be made between the 2 parts.

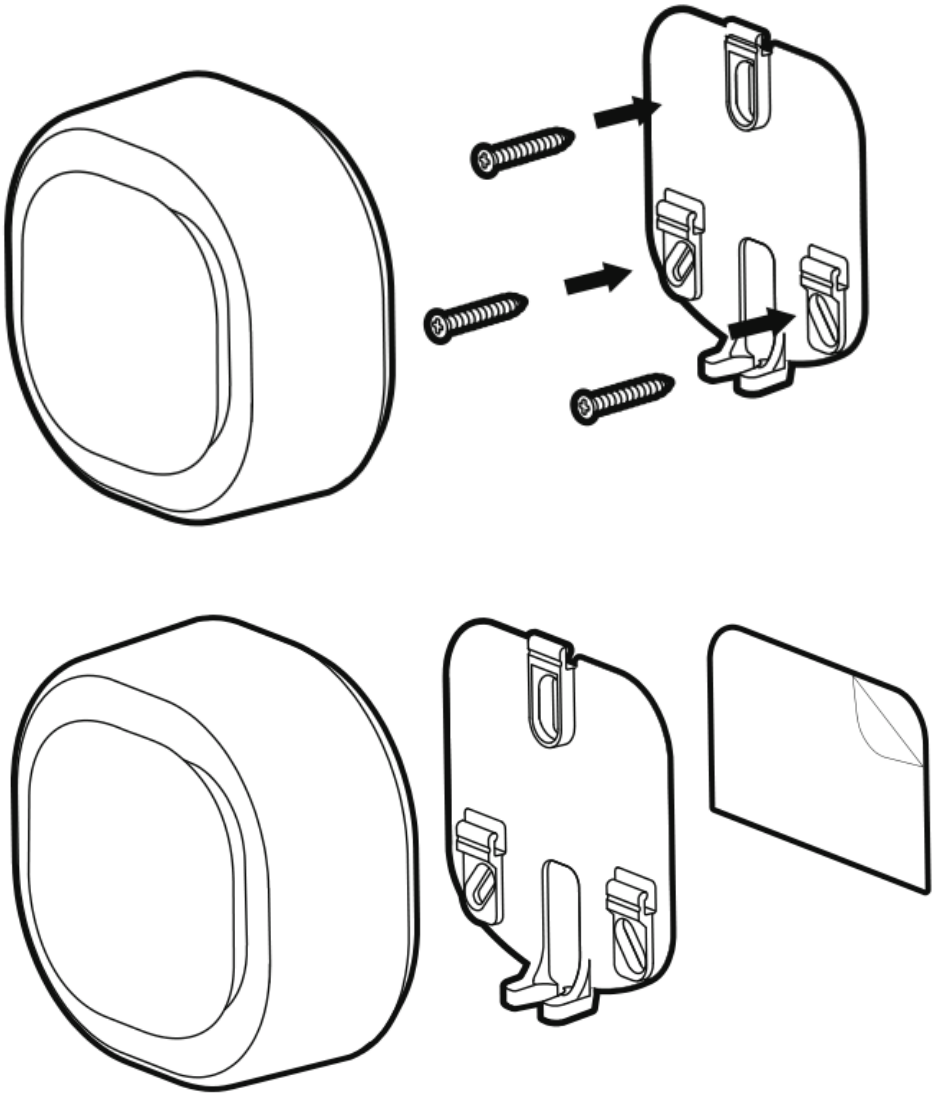
1. Select an installation location for Chime. Do not yet install it.

2. Power on Chime via the provided power adapter.

3. Affix Chime in the desired installation location using the provided mounting plate.

a. Affix the mounting plate to the selected surface; affix it using either 3 × 20mm screws or double-sided tape.

b. Lock your Chime onto the mounting plate.



3.7 How to install Button

Avoid exposing Button to direct sunlight where possible to avoid UV damage and reduced battery performance.

1. Select an installation location for Button. Do not yet install it.

2. Power on Button.

a. Remove the 2 screws from Button's rear to open its battery cover and install the provided CR2450 battery with the positive (+) on top.

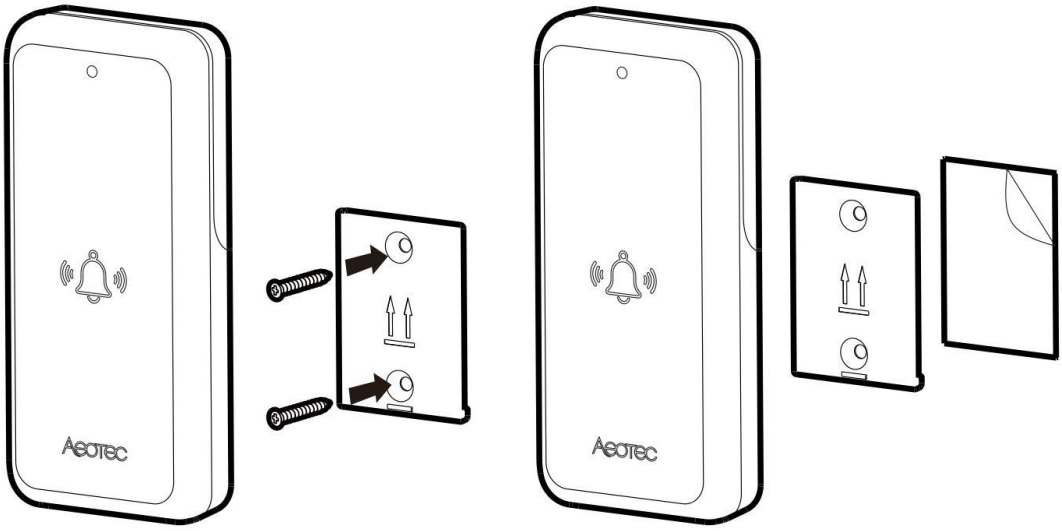
b. Replace the battery cover and the 2 screws.

3. Test the wireless connection by pressing Ring Button to trigger a doorbell alert. Select an alternative installation location for Chime if the connection is poor.

4. Install Button.

a. Affix the mounting plate to the selected surface; affix it using either 2 × 20mm screws or double-sided tape.

b. Lock your Button onto the mounting plate.



3.8 How to pair Button

There are two way to trigger pairing Button:

- Manually quick click Chime Action Button.
- With Configuration Set. Please refer to Configuration Parameter=0x24 for details.

Below is mainly about manually quick click Chime Action Button to trigger pairing Button.

1. **Different click times will trigger pairing different Button. Please action as shown below.**

- Click Action Button **3 times** quickly will trigger pairing **#1 Button**.
- Click Action Button **4 times** quickly will trigger pairing **#2 Button**.
- Click Action Button **5 times** quickly will trigger pairing **#3 Button**.

2. **Observe the Indicator Light of Chime to make sure which Button is waiting for pairing.**

- When pairing **#1 Button** is triggered, it will bright **1 time** ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #1 Button has already triggered. Pairing time is up to 10 seconds. In this time period, user MUST manually click Ring Button 3 times quickly.
- When pairing **#2 Button** is triggered, it will bright **2 times** ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #2 Button has already triggered. Pairing time is up to 10 seconds. In this time period, user MUST manually click Ring Button 3 times quickly.
- When pairing **#3 Button** is triggered, it will bright **3 times** ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #3 Button has already triggered. Pairing time is up to 10 seconds. In this time period, user MUST manually click Ring Button 3 times quickly.

3. **Determine pairing results.**

- If pairing Button succeeds, Chime will quickly flash White light 3 times and play the corresponding tone of paired Button once, and then become breathing White light (when Chime is out of the Z-Wave network) or off (when Chime is in the Z-Wave network)
- If pairing Button fairs, Chime will slowly flash White light 3 times and then become breathing White light (when Chime is out of the Z-Wave network) or off (when Chime is in the Z-Wave network).
- Each successful pairing will overwrite the previous paired Button which has the same Button Number.

Note:

- ONLY one Button can be paired at a time.
- This manually quick click Action Button operation can ONLY be used to trigger pairing, not unpairing.

3.9 How to unpair Button

There is ONLY one way to trigger unpairing Button:

- With Configuration Set. Please refer to Configuration Parameter=0x24 for details.

4 SOFTWARE FUNCTION DEFINITION

4.1 Function Overview

Function Item	Description
Inclusion	**When the product is out of the network:** ● If a controller is requesting to add a product and the product enters the Learning Mode with sending Node Info, the product will be added to the controller's network with a NodeID assigned by the controller. **When the product is in the network:** ● If a controller in the network is requesting to add a product and the product enters the Learning Mode with sending Node Info, the product will be added to the controller's network again but the NodeID of the product will not change. ● If a controller in another network is requesting to add a product and the product enters the Learning Mode with sending Node Info, the product will NOT be added to the controller's network.
Exclusion	**When the product is out of the network:** ● If a controller is requesting to remove a product and the product enters the Learning Mode with sending Node Info, the product will be removed from the controller's network, and keep being out of the network. **When the product is in the network:** ● If a controller in the network is requesting to remove a product and the product enters the Learning Mode with sending Node Info, the product will be removed from the controller's network, and become out of the network. ● If a controller in another network is requesting to remove a product and the product enters the Learning Mode with sending Node Info, the product will be removed from the controller's network, and become out of the network.
Factory Reset	● Long press Action Button more than 20s. Please refer to Section 4.2 for details. ● Sending Configuration Set. Please refer to Configuration Parameter=0xFF for details.
Power-down Memory	Remember the configuration information after the product is powered off.
Tone Play	Play the built-in tone with Sound Switch Tone Play Set, Basic Set, or Configuration Set.
Volume Adjustment	Adjust the volume with Sound Switch Configuration Set or Configuration Set.
Tone Group	Include 1 Browse Group, 3 Remote Group, 2 Siren Group, and 1 Instant Group. ● **Browse Group:** Used for browsing the built-in tone, and can be triggered by Sound Switch Tone Play Set, Basic Set, or Configuration Set. ● **Remote Group:** Used for Button wireless control, and can be triggered by Sound Switch Tone Play Set, Basic Set, or Configuration Set, as well as paired Button. ● **Siren Group:** Cooperate with other nodes as a siren, and can be triggered by Sound Switch Tone Play Set, Basic Set, or Configuration Set. ● **Instant Group:** Used for continuous playback without pause, and can be triggered by Sound Switch Tone Play Set, Basic Set, or Configuration Set.
Tone Group Customization	Can custom different Tone Group Parameters with Configuration Set, including Tone Index, Play Control, Play Mode, Volume, Light Effect Index, Interval Between 2 tones, Continuous Play Count, Intercept The Length Of A Tone. Tone Name can't be customized by user.
Pair or Unpair Button	● A Chime supports up to 3 Buttons at the same time, while a Button can support multiple Chime at the same time. **There are two way to trigger pairing Button:** ● Manually quick click Chime Action Button. Please refer to Section 3.8 for details. ● With Configuration Set. Please refer to Configuration Parameter=0x24 for details. **There is ONLY one way to trigger unpairing Button:** ● With Configuration Set. Please refer to Configuration Parameter=0x24 for details.

4.2 User Behavior Interaction

User behavior	Out of the Z-Wave network		In the Z-Wave network	
	Function	Indicator Light	Function	Indicator Light
Power OFF	NA	OFF	NA	OFF

Power ON	Supply Power	When powered by battery, it will be breathing White light for 30 seconds (max). When powered by adapter, it will be breathing White light all the time.	Supply Power	White light for 2 seconds and then become off.
Click Action Button once	Send Node Info for Inclusion	When click Action Button once, it will quickly flash White light for 30 seconds until Chime is added into the network. It will become constantly bright White light after being assigned a NodeID. If Inclusion succeeds, it will quickly flash White light 3 times and then off. If Inclusion fairs, it will slowly flash White light 3 times and then become breathing White light. If Action Button is clicked again during the network access process, the network access process will exit, at the same time the Indicator Light will extinguish immediately, and then become breathing White light.	Stop playing the sound and light	Immediately OFF
Click Action Button 3 times quickly	Trigger pairing #1 Button	It will bright 1 time ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #1 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become breathing White light. If pairing Button fairs, it will slowly flash White light 3 times and then become breathing White light.	Trigger pairing #1 Button	It will bright 1 time ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #1 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become off. If pairing Button fairs, it will slowly flash White light 3 times and then become off.
Click Action Button 4 times quickly	Trigger pairing #2 Button	It will bright 2 times ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #2 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become breathing White light. If pairing Button fairs, it will slowly flash White light 3 times and then become breathing White light.	Trigger pairing #2 Button	It will bright 2 times ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #2 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become off. If pairing Button fairs, it will slowly flash White light 3 times and then become off.
Click Action Button 5 times quickly	Trigger pairing #3 Button	It will bright 3 times ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #3 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become breathing	Trigger pairing #3 Button	It will bright 3 times ON 0.5s OFF 1s, and then become constantly bright White light, indicating that pairing #3 Button has already triggered. If pairing Button succeeds, it will quickly flash White light 3 times and then become off. If

		White light. If pairing Button fairs, it will slowly flash White light 3 times and then become breathing White light.		pairing Button fairs, it will slowly flash White light 3 times and then become off.
Click Action Button 6 times quickly	Reserved	Reserved	Send Node Info for Exclusion	White light is on, up to 2s. If Exclusion succeeds, it will quickly flash White light 3 times and then become breathing White light. If Exclusion fairs, it will become off.
Long Press Action Button [1, 2s)	Reserved	Keep off from press to release.	Reserved	Keep off from press to release.
Long Press Action Button [2, 5s)	Test the sound and light of the Browse Group	White light when press, and display in the default sound and light configuration of the Browse Group when release.	Test the sound and light of the Browse Group	White light when press, and display in the sound and light configuration of the Browse Group, based on Configuration Parameter 0x02, when release.
Long Press Action Button [5, 10s)	Reserved	Brighter White light when press, and become off when release.	Reserved	Brighter White light when press, and quickly flash White light when release, indicating start to test communication quality between Chime and Node 1. At the end of the test, the White light is on for 2 seconds. If the communication quality is Good or Great, it will quickly flash White light 3 times and then become off. If the communication quality is Weak, it will slowly flash White light 3 times and then become off.
Long Press Action Button [10, 20s)	Reserved	Speedup flashing White light when press, and become off when release.	Reserved	Speedup flashing White light when press, and become off when release.
Long Press Action Button [20, ∞)	Factory Reset	When the time reaches 20s, the Factory Reset is performed no matter it is pressed or released. If Factory Reset succeeds, it will quickly flash White light 3 times and then become breathing White light.	Factory Reset after sending Device Reset Locally Notification Report	When the time reaches 20s, Factory Reset is performed no matter it is pressed or released. If Factory Reset succeeds, it will quickly flash White light 3 times and then become breathing White light. If Factory Reset fails, it will become off when release.

4.3 Supplementary Explanation about Button

Function	Description
Wireless Control Chime	When click Ring Button once, Button can wireless control the corresponding paired Chime.
Pairing Chime	When click Ring Button 3 times quickly, Button can be paired to Chime while Chime triggers pairing Button.
Sending Button Info to Chime	When re-power or click Ring Button, Button will send its Button ID, Battery Voltage and Firmware Version to its corresponding paired Chime.
Automatic sleep	After sending Button Info to Chime, Button will sleep automatically for saving battery life.
Low Battery Indicator Light	If #1 Button is low battery, Chime Indicator Light will repeat cycle (ON 100ms OFF 5s) If #2 Button is low battery, Chime Indicator Light will repeat cycle

	(ON 100ms OFF 100ms ON 100ms OFF 5s) If #3 Button is low battery, Chime Indicator Light will repeat cycle (ON 100ms OFF 100ms ON 100ms OFF 100ms ON 100ms OFF 5s) ● Low Battery Indicator Light will be activated when Chime detects the corresponding paired Button is low battery, and disappears after the battery returns to normal. ● When the battery voltage of Button is lower than 2.8V, it is judged to be low battery. ● When the battery voltage of Button restores to over 2.9V, it is judged to return to normal. ● Low Battery Indicator Light has the lowest priority among all light effects, that is, it will be displayed when there is no other light effect. ● The light effect of the 3 Buttons are different. When multiple Buttons is low battery at the same time, the corresponding light effect of the Button with smaller Button Number is displayed first.

4.4 Tone Group Priority Definition

(#1 Siren = #2 Siren) > (#1 Remote = #2 Remoter = #3 Remote) > (Browse = Instant)

Rule Description	Example
A Tone Group is triggered, and the triggered Tone Group event is not released, if the other Tone Group event with lower priority than the Tone Group is triggered at this time, the Tone Group is maintained.	The #1 Siren Group is triggered and the Tone of #1 Siren Group is not stopped. At this time, if the paired #1 Button is clicked once, the Tone of the #1 Button Group will not be triggered, and the Tone of the #1 Siren Group will be maintained.
A Tone Group is triggered, and the triggered Tone Group event is not released, if the other Tone Group event with higher priority or the same priority than the Tone Group is triggered, it is immediately replaced by the new Tone Group.	The #1 Remote Group is triggered and the Tone of #1 Remote Group is not stopped. At this time, if the paired #2 Button is clicked once, the Tone of the #1 Remote Group will be stopped, and the Tone of the #2 Remote Group will be play immediately.

4.5 SDK, Library and Device Classes

The application is based on:

Parameter	Value
SDK	6.71.03
Library	Enhanced 232 slave
Role Type	Always On Slave (AOS)
Device Type	Sound Switch
Supported security keys	S0, S2_UNAUTHENTICATION, S2_AUTHENTICATION

4.6 Announced Command Classes in NIF

The application implements a number of mandatory and optional command classes.

Command Class	Version	Not added	Non-secure added	Securely added	
				Non-secure CC	Secure CC
ZWAVEPLUS_INFO	2	Support	Support	Support	
VERSION	2	Support	Support		Support
CONFIGURATION	1	Support	Support		Support
MANUFACTURER_SPECIFIC	2	Support	Support	Support	
ASSOCIATION_GRP_INFO	1	Support	Support		Support
ASSOCIATION	2	Support	Support		Support
POWERLEVEL	1	Support	Support		Support
MULTI_CHANNEL_ASSOCIATION	3	Support	Support		Support
MULTI_CHANNEL	4	Support	Support		Support

DEVICE_RESET_LOCALLY	1	Support	Support	Support	
TRANSPORT_SERVICE	2	Support	Support	Support	
SECURITY	1	Support	Support	Support	
SECURITY_2	1	Support	Support	Support	
SUPERVISION	1	Support	Support	Support	
FIRMWARE_UPDATE_MD	4	Support	Support		Support
NOTIFICATION	8	Support	Support		Support
SOUND_SWITCH	1	Support	Support		Support

4.7 Basic Command Class mapping

Basic Set Command (value) maps to Sound Switch Tone Play Set Command (Tone Identifier).

Basic Get Command maps to Sound Switch Tone Play Get Command.

Basic Report Command maps to Sound Switch Tone Play Report Command.

4.8 Z-Wave Plus Info

Parameter	Value
Z-Wave Plus Version	1
Role Type	5 (ZWAVEPLUS_INFO_REPORT_ROLE_TYPE_SLAVE_ALWAYS_ON)
Node Type	0 (ZWAVEPLUS_INFO_REPORT_NODE_TYPE_ZWAVEPLUS_NODE)
Installer Icon Type	0x2000 (ICON_TYPE_GENERIC_SOUND_SWITCH)
User Icon Type	0x2000 (ICON_TYPE_GENERIC_SOUND_SWITCH)

4.9 Manufacturer Specific

Parameter	Value
Manufacturer ID 1	0x03
Manufacturer ID 2	0x71
Product Type ID 1	EU=0x00, US=0x01, AU=0x02, CN=0x1D
Product Type ID 2	0x03
Product ID 1	0x00
Product ID 2	0xA2

4.10 Version

Parameter	Value
Z-Wave Protocol Library Type	0x03
Z-Wave Protocol Version	0x05
Z-Wave Protocol Sub Version	0x03
Firmware 0 Version	ZM5101 Software Version MSB
Firmware 0 Sub Version	ZM5101 Software Version LSB
Hardware Version	0xA2
Number of firmware targets	0x00

4.11 Multi Channel

Parameter	Value
Individual End Points	7
Aggregated End Points	0

Dynamic	0
Identical	1
Generic Device Class	GENERIC_TYPE_AV_CONTROL_POINT
Specific Device Class	SPECIFIC_TYPE_SOUND_SWITCH
Command Classes	COMMAND_CLASS_ZWAVEPLUS_INFO COMMAND_CLASS_SECURITY COMMAND_CLASS_SECURITY_2 COMMAND_CLASS_SUPERVISION COMMAND_CLASS_ASSOCIATION COMMAND_CLASS_ASSOCIATION_GRP_INFO COMMAND_CLASS_MULTI_CHANNEL_ASSOCIATION COMMAND_CLASS_NOTIFICATION COMMAND_CLASS_SOUND_SWITCH

4.12 Sound Switch

(1)Sound Switch Tones Number Report Command

Supported Tones = 10 (example)

(2)Sound Switch Tone Info Report Command (example)

Tone Identifier	Tone Duration	Name Length	Name
1	0x0014	8	1AMBUL~1
2	0x0001	8	2ALARM~1
3	0x0014	8	3POLIC~1
4	0x003A	8	4FIRE~1
5	0x000F	8	5GASLE~1
6	0x0003	8	6MODER~1
7	0x000B	8	7ELECT~1
8	0x0002	8	8CLASS~1
9	0x003C	8	9ARMIN~1
10	0x003C	8	10SECU~1

(3)Sound Switch Configuration Report Command

Parameter	Valid Value	Default Value
Volume	0..7	7
Default Tone Identifier	0..Supported Tones	1

Note:

Since the tones in the Chime may be changed according to customer requirements, the Supported Tones and the Tone Info may be different. However, the difference will not affect the normal use of the application.

Besides, the Default Value of Volume and Default Tone Identifier in Sound Switch Configuration Report Command will not be modified the initial defaults although the customer requests to change tones.

4.13 Notification

Notification Type		Notification Events		Description
Home Security	0x07	State idle	0x00	Vibration event is inactive
		Tampering, product cover removed	0x03	Vibration event is triggered
Power Management	0x08	State idle	0x00	Button’s battery comes back to normal
		Replace battery soon	0x0A	Button’s battery is in low battery
Siren	0x0E	State idle	0x00	Chime alarm is inactive
		Siren active	0x01	Chime alarm is triggered

4.14 Association groups information

Backwards compatibility for non-Multi Channel devices, forces the root device AGI table to contain all the association groups mentioned in each of the endpoints AGI tables except from group 1, the Lifeline group.

Root device

ID	Name	Node count	Profile	Function
1	Lifeline	5	General: Lifeline	● Send Device Reset Locally Notification when Factory Reset. ● Send Sound Switch Tone Play Report when Chime is triggered to play tone. ● Send Sound Switch Configuration Report when the volume or default tone is changed. ● Send Configuration Report (Parameter=0x24) after finishing pairing or unpairing Button. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime is inactive. ● Send Notification Report(Type=0x07;Event=0x03) when vibration sensor is triggered. ● Send Notification Report(Type=0x07;Event=0x00) when vibration sensor is inactive. ● Send Notification Report(Type=0x08;Event=0x0A) when Button's battery is in low battery. ● Send Notification Report(Type=0x08;Event=0x00) when Button's battery comes back to normal.
2	On/Off control (Browse)	5	Notification: Siren	Mirror of endpoint 1, group 2
3	On/Off control (Remote 1)	5	Notification: Siren	Mirror of endpoint 2, group 2
4	On/Off control (Remote 2)	5	Notification: Siren	Mirror of endpoint 3, group 2
5	On/Off control (Remote 3)	5	Notification: Siren	Mirror of endpoint 4, group 2
6	On/Off control (Siren 1)	5	Notification: Siren	Mirror of endpoint 5, group 2
7	On/Off control (Siren 2)	5	Notification: Siren	Mirror of endpoint 6, group 2
8	On/Off control (Instant)	5	Notification: Siren	Mirror of endpoint 7, group 2

Endpoint 1

ID	Name	Node count	Profile	Function
1	Browse via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime Browse Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of Browse Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime Browse Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime Browse Group is inactive.
2	On/Off control (Browse)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime Browse Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime Browse group comes back to normal.

Endpoint 2

ID	Name	Node count	Profile	Function
1	Remote 1 via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime #1 Remote Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of #1 Remote Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime #1 Remote Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime #1 Remote Group is inactive. ● Send Notification (Type=0x08; Event=0x0A) when Chime #1 Button's battery is in low battery. ● Send Notification (Type=0x08; Event=0x00) when Chime #1 Button's battery comes back to normal.
2	On/Off control (Remote 1)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime #1 Remote Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime #1 Remote Group comes back to normal.

Endpoint 3

ID	Name	Node count	Profile	Function
1	Remote 2 via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime #2 Remote Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of #2 Remote Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime #2 Remote Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime #2 Remote Group is inactive. ● Send Notification (Type=0x08; Event=0x0A) when Chime #2 Button's battery is in low battery. ● Send Notification (Type=0x08; Event=0x00) when Chime #2 Button's battery comes back to normal.
2	On/Off control (Remote 2)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime #2 Remote Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime #2 Remote Group comes back to normal.

Endpoint 4

ID	Name	Node count	Profile	Function
1	Remote 3 via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime #3 Remote Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of #3 Remote Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime #3 Remote Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime #3 Remote Group is inactive. ● Send Notification (Type=0x08; Event=0x0A) when Chime #3 Button's battery is in low battery. ● Send Notification (Type=0x08; Event=0x00) when Chime #3 Button's battery comes back to normal.
2	On/Off control (Remote 3)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime #3 Remote Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime #3 Remote Group comes back to normal.

Endpoint 5

ID	Name	Node count	Profile	Function
1	Siren 1 via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime #1 Siren Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of #1 Siren Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime #1 Siren Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime #1 Siren Group is inactive.
2	On/Off control (Siren 1)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime #1 Siren Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime #1 Siren Group comes back to normal.

Endpoint 6

ID	Name	Node count	Profile	Function
1	Siren 2 via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime #2 Siren Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of #2 Siren Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime #2 Siren Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime #2 Siren Group is inactive.
2	On/Off control (Siren 2)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime #2 Siren Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime #2 Siren Group comes back to normal.

Endpoint 7

ID	Name	Node count	Profile	Function
1	Instant via Lifeline	0	Notification: Siren	● Send Sound Switch Tone Play Report when Chime Instant Group is triggered to paly tone. ● Send Sound Switch Configuration Report when the volume or default tone of Instant Group is changed. ● Send Notification Report(Type=0x0E;Event=0x01) when Chime Instant Group is triggered. ● Send Notification Report(Type=0x0E;Event=0x00) when Chime Instant Group is inactive.
2	On/Off control (Instant)	5	Notification: Siren	Forward Basic Set with 0xFF to associated nodes in this group when Chime Instant Group is triggered and forward Basic Set with 0x00 to associated nodes in this group when Chime Instant Group comes back to normal.

4.15 Configuration

<table>
<tr><th>Param.</th><th>Description</th><th>W/R</th><th>Default</th><th>Size</th></tr>
<tr><td>0x02
(2)</td><td>Set or Get Browse Group
<table>
<tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr>
<tr><td colspan="4">Reserved</td><td colspan="4">Volume</td></tr>
<tr><td colspan="5">Reserved</td><td colspan="3">Light Effect Index</td></tr>
<tr><td colspan="8">Play Mode</td></tr>
</table>
Tone Index (Max=Supported Tones)
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Reserved</td></tr>
<tr><td>1..Max</td><td>Set the default tone</td></tr>
<tr><td>Other</td><td>Reserved</td></tr>
<tr><td>31</td><td>Use last valid configuration</td></tr>
</table>
Play Control
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Set but not play</td></tr>
<tr><td>1</td><td>Play</td></tr>
<tr><td>2</td><td>Stop</td></tr>
<tr><td>3</td><td>Previous (In this case, Tone Index MUST be equal to 31)</td></tr>
<tr><td>4</td><td>Next (In this case, Tone Index MUST be equal to 31)</td></tr>
<tr><td>5</td><td>Reserved</td></tr>
<tr><td>6</td><td>Reserved</td></tr>
<tr><td>7</td><td>Use last valid configuration</td></tr>
</table>
Volume
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Mute</td></tr>
<tr><td>1..7</td><td>1 is the minimum volume, while 7 is the maximum volume</td></tr>
<tr><td>8..14</td><td>Reserved</td></tr>
<tr><td>15</td><td>Use last valid configuration</td></tr>
</table>
Light Effect Index
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0..6</td><td>Select the specified Light Effect. The Light Effect can be configured by parameter 0x0A-0x10</td></tr>
<tr><td>7</td><td>Use last valid configuration</td></tr>
</table>
Play Mode
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Single No Loop Play</td></tr>
<tr><td>1</td><td>Single Loop Play</td></tr>
<tr><td>2</td><td>List Loop Play</td></tr>
<tr><td>3</td><td>List Random Play</td></tr>
<tr><td>4..254</td><td>Reserved</td></tr>
<tr><td>255</td><td>Use last valid configuration</td></tr>
</table>
Note:
Tone Index maps to the Default Tone Identifier of Sound Switch Configuration Set CC. Volume maps to the Volume of Sound Switch Configuration Set CC.</td><td>WR</td><td>0x34070000</td><td>4</td></tr>
<tr><td>0x03
(3)</td><td>Set or Get #1 Remote Group
<table>
<tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr>
<tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr>
<tr><td colspan="4">Interval Between 2 Tones</td><td colspan="4">Volume</td></tr>
<tr><td colspan="5">Continuous Play Count</td><td colspan="3">Light Effect Index</td></tr>
<tr><td colspan="8">Intercept The Length Of A Tone</td></tr>
</table></td><td>WR</td><td>0x09070914</td><td>4</td></tr>
</table>

Tone Index (Max=Supported Tones)

Value	Description
0	Reserved
1..Max	Set the default tone
Other	Reserved
31	Use last valid configuration

Control

Value	Description
0	Set but not play
1	Play
2	Stop
3..6	Reserved
7	Use last valid configuration

Volume

Value	Description
0	Mute
1..7	1 is the minimum volume, while 7 is the maximum volume
8..14	Reserved
15	Use last valid configuration

Interval Between 2 Tones

Value	Description
0	Not stopping
1..14	1-14 seconds, the interval time between 2 tones
15	Use last valid configuration

Light Effect Index

Value	Description
0..6	Select the specified Light Effect. The Light Effect can be configured by parameter 0x0A-0x10
7	Use last valid configuration

Continuous Play Count

Value	Description
0	Continuous Play
1..30	1-30 times, the count that the tone will be repeated to be played
31	Use last valid configuration

Intercept The Length Of A Tone

Value	Description
0	The Length Of A Tone Itself.
1..254	1-254 seconds, Intercept The Length Of A Tone. Actual Single Play Time is equal to the smaller value between The Length Of A Tone Itself and Intercept The Length Of A Tone.
255	Use last valid configuration

Note:
Tone Index maps to the Default Tone Identifier of Sound Switch Configuration Set CC. Volume maps to the Volume of Sound Switch Configuration Set CC.

Total Tone Playback Time =
Continuous Play Count x (Actual Single Play Time + Interval Between 2 Tones)

0x04 (4) — WR — 0x19070914 — 4

Set or Get #2 Remote Group

7	6	5	4	3	2	1	0
Tone Index					Play Control		
Interval Between 2 Tones				Volume			
Continuous Play Count					Light Effect Index		
Intercept The Length Of A Tone							

Note:
The valid values can be referenced to the definition of parameter 0x03.

<table>
<tr><td>0x05
(5)</td><td>Set or Get #3 Remote Group<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr><tr><td colspan="4">Interval Between 2 Tones</td><td colspan="4">Volume</td></tr><tr><td colspan="5">Continuous Play Count</td><td colspan="3">Light Effect Index</td></tr><tr><td colspan="8">Intercept The Length Of A Tone</td></tr></table>Note:
The valid values can be referenced to the definition of parameter 0x03.</td><td>WR</td><td>0x29070914</td><td>4</td></tr>
<tr><td>0x06
(6)</td><td>Set or Get #1 Siren Group<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr><tr><td colspan="4">Interval Between 2 Tones</td><td colspan="4">Volume</td></tr><tr><td colspan="5">Continuous Play Count</td><td colspan="3">Light Effect Index</td></tr><tr><td colspan="8">Intercept The Length Of A Tone</td></tr></table>Note:
The valid values can be referenced to the definition of parameter 0x03.</td><td>WR</td><td>0x89070A14</td><td>4</td></tr>
<tr><td>0x07
(7)</td><td>Set or Get #2 Siren Group<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr><tr><td colspan="4">Interval Between 2 Tones</td><td colspan="4">Volume</td></tr><tr><td colspan="5">Continuous Play Count</td><td colspan="3">Light Effect Index</td></tr><tr><td colspan="8">Intercept The Length Of A Tone</td></tr></table>Note:
The valid values can be referenced to the definition of parameter 0x03.</td><td>WR</td><td>0x91070A14</td><td>4</td></tr>
<tr><td>0x08
(8)</td><td>Set or Get Instant Group<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="5">Tone Index</td><td colspan="3">Play Control</td></tr><tr><td colspan="4">Interval Between 2 Tones</td><td colspan="4">Volume</td></tr><tr><td colspan="5">Continuous Play Count</td><td colspan="3">Light Effect Index</td></tr><tr><td colspan="8">Intercept The Length Of A Tone</td></tr></table>Note:
The valid values can be referenced to the definition of parameter 0x03.
The valid values of Interval Between 2 Tones are only 0 and 15.
The valid values of Continuous Play Count are only 0 and 31.</td><td>WR</td><td>0x79070314</td><td>4</td></tr>
<tr><td>0x0A
(10)</td><td>Set or Get Light Effect Index 0<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="8">Brighten Duration</td></tr><tr><td colspan="8">Dim Duration</td></tr><tr><td colspan="8">Light ON Duration</td></tr><tr><td colspan="8">Light OFF Duration</td></tr></table>Brighten Duration
The time from Light OFF to Light ON. (Unit = 10ms)

Dim Duration
The time from Light ON to Light OFF. (Unit = 10ms)

Light On Duration
The time of Light ON. (Unit = 100ms)

Light Off Duration
The time of Light OFF. (Unit = 100ms)

Note:
Total Light Effect Time = Brighten + Dim + Light ON + Light OFF</td><td>WR</td><td>0x96321403</td><td>4</td></tr>
<tr><td>0x0B
(11)</td><td>Set or Get Light Effect Index 1
Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td>WR</td><td>0x64640003</td><td>4</td></tr>
<tr><td>0x0C</td><td>Set or Get Light Effect Index 2</td><td>WR</td><td>0x00420103</td><td>4</td></tr>
</table>

<table>
<tr><td>(12)</td><td>Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td></td><td></td><td></td></tr>
<tr><td>0x0D
(13)</td><td>Set or Get Light Effect Index 3
Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td>WR</td><td>0x42000003</td><td>4</td></tr>
<tr><td>0x0E
(14)</td><td>Set or Get Light Effect Index 4
Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td>WR</td><td>0x0000000A</td><td>4</td></tr>
<tr><td>0x0F
(15)</td><td>Set or Get Light Effect Index 5
Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td>WR</td><td>0x00000A00</td><td>4</td></tr>
<tr><td>0x10
(16)</td><td>Set or Get Light Effect Index 6
Note:
The valid values can be referenced to the definition of parameter 0x0A.</td><td>WR</td><td>0x42000001</td><td>4</td></tr>
<tr><td>0x11
(17)</td><td>Set or Get the volume of vibration sensor alarm
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Mute</td></tr><tr><td>1-7</td><td>1 is the minimum volume, while 7 is the maximum volume</td></tr><tr><td>Other</td><td>Reserved</td></tr></table></td><td>WR</td><td>7</td><td>1</td></tr>
<tr><td>0x20
(32)</td><td>Communication Quality Report (REPORT ONLY)
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Weak</td></tr><tr><td>15</td><td>Good</td></tr><tr><td>255</td><td>Great</td></tr><tr><td>Other</td><td>Reserved</td></tr></table>Note:
Can be used to confirm the communication quality between Chime and Node 1.
The function will be activated after long pressing Action Button for 5 seconds.</td><td>NA</td><td>-</td><td>1</td></tr>
<tr><td>0x21
(33)</td><td>Get the information of #1 Button (GET ONLY)
<table><tr><th>7</th><th>6</th><th>5</th><th>4</th><th>3</th><th>2</th><th>1</th><th>0</th></tr><tr><td colspan="8">Button Pairing State</td></tr><tr><td colspan="8">Button Battery Voltage MSB</td></tr><tr><td colspan="8">Button Battery Voltage LSB</td></tr><tr><td colspan="8">Button Firmware Version</td></tr></table>Button Pairing State
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Unpaired</td></tr><tr><td>1</td><td>Paired</td></tr><tr><td>Other</td><td>Reserved</td></tr></table>Button Battery Voltage MSB & LSB
<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>Unpaired</td></tr><tr><td>1-66634</td><td>The unit of Battery Voltage is mV</td></tr><tr><td>65535</td><td>Low power</td></tr></table>Button Firmware Version
<table><tr><th>Bit</th><th>Description</th></tr><tr><td>Bit 0~3</td><td>The LSB of Button Firmware Version</td></tr><tr><td>Bit 4~7</td><td>The MSB of Button Firmware Version</td></tr></table>For example, if Button Firmware Version equals to 0x10, it means V1.00.
Note:
This parameter does not restore the default value when remove from the network or reset the factory settings.</td><td>R</td><td>-</td><td>4</td></tr>
<tr><td>0x22
(34)</td><td>Get the information of #2 Button
Note:
The valid values can be referenced to the definition of parameter 0x21.</td><td>R</td><td>-</td><td>4</td></tr>
<tr><td>0x23
(35)</td><td>Get the information of #3 Button
Note:
The valid values can be referenced to the definition of parameter 0x21.</td><td>R</td><td>-</td><td>4</td></tr>
</table>

<table>
<tr>
<td>0x24
(36)</td>
<td>
Pair or Unpair Button
<table>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td></tr>
<tr><td colspan="4">Pairing Control</td><td colspan="4">Button Number Bit Mask</td></tr>
</table>

<u>Set:</u>
Button Number Bit Mask(4 bits)
<table>
<tr><th>Bit</th><th>Description</th></tr>
<tr><td>Bit 0</td><td>#1 Button</td></tr>
<tr><td>Bit 1</td><td>#2 Button</td></tr>
<tr><td>Bit 2</td><td>#3 Button</td></tr>
<tr><td>Bit 3</td><td>Reserved</td></tr>
</table>
If want to pair or unpair the specified Button, the sending node MUST set the corresponding bit of Button to 1.

Pairing Control (4 bits)
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0</td><td>Unpair Button</td></tr>
<tr><td>1</td><td>Pair Button</td></tr>
<tr><td>Other</td><td>Reserved</td></tr>
</table>
Pair Button
ONLY one Button can be paired at a time. The node will ignore commands which want to pair multiple Buttons at the same time.

When pairing Button is triggered, Chime will always bright White light. Pairing time is up to 10 seconds. In this time period, user MUST manually click Ring Button 3 times quickly.

If pairing Button succeeds, Chime will quickly flash White light 3 times and play the corresponding tone of paired Button once, and then become off.

Each successful pairing will overwrite the previous paired Button which has the same Button Number.

If pairing Button fails, Chime will slowly flash White light 3 times and then become off.

Unpair Button
Multiple Buttons can be unpaired at a time.

When unpairing Button is triggered, user does NOT need to do anything to the Button.

When unpairing Button is finished, Chime will quickly flash White light 3 times and then become off.

<u>Get:</u>
Can be used to request which Buttons has been paired after finishing pairing or unpairing Button.

<u>Report:</u>
When pairing Button is triggered, Chime will automatically report 0x24 once to notify which Button is waiting for pairing. At this moment, the Pairing Control is equal to 1, and the corresponding bit of Button is equal to 1.

When pairing Button is finished, Chime will automatically report 0x24 once to notify which Buttons has been paired. At this moment, the Pairing Control is equal to 2, and the corresponding bit of Button which has been paired is equal to 1 while the corresponding bit of Button which has been unpaired is equal to 0.

When unpairing Button is finished, Chime will automatically report 0x24 once to notify which Buttons has been unpaired. At this moment, the Pairing Control is equal to 2, and the corresponding bit of Button which has been paired is equal to 1 while the corresponding bit of Button which has been unpaired is equal to 0.
</td>
<td>WR</td>
<td>-</td>
<td>1</td>
</tr>
</table>

	Note: This parameter does not restore the default value when remove from the network or reset the factory settings.			
0xFF (255)	Reset to factory default setting OR remove from the Z-Wave network (SET ONLY) If Size=4, Default=1, Value=0x55555555, then Reset to factory default setting (except 0x21/0x22/0x23/0x24) and remove from the Z-Wave network.	W	-	4
	If Size=1, Default=1, Value=0, then ONLY reset to factory default setting (except 0x21/0x22/0x23/0x24)	W	-	1