Smoke and Carbon Monoxide Detector (SDCO-1-RhTH-ZW-SC-AC/SDCO-1-RhTH-ZW-SC-OTA-AC)

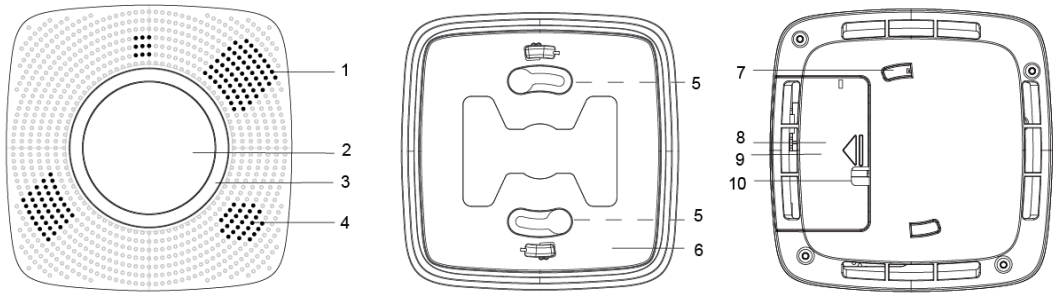
Introduction

SDCO-1-RhTH-ZW-SC-AC/SDCO-1-RhTH-ZW-SC-OTA-AC is a Z-Wave Smoke and Carbon Monoxide Detector with temperature, humidity, and heat detection, as well as voice prompts and allows access to the “S2 Unauthenticated” class. It is capable of sending wireless signals to the Z-Wave gateway/control panel upon detection of smoke particles or Carbon Monoxide. The device is also serially connected with other sensors in the Z-Wave gateway to serve as an extra siren. When any other sensor in the Z-Wave network is activated and sends an alarm signal, the Smoke Detector will also raise alarm with its built-in buzzer as a siren to help sound warning (for serial connection models).

The SDCO-1 is designed to be mounted on ceiling or top of stairwells when smoke would concentrate to raise alarm timely and protect your home from fire hazards.

The SDCO is a Z-Wave enabled device and is fully compatible with any Z-Wave enabled network. Z-Wave is a wireless communication protocol that uses a low-power RF radio.

Parts Identification



1. Speaker

2. Button

- Press the button once to send an alarm test, temperature and humidity signals / test Smoke and Carbon Monoxide Detector.
- Press the button once during alarm to silence the alarm.
- Press the button 3 times within 1.5 seconds to send an inclusion code.
- Press and hold the button for 10 seconds. Release the button when you hear 2 beeps to enter smoke calibration and CO self-diagnosis process.
- Press and hold the button for 20 seconds. Release the button when you hear 3 beeps to perform factory reset.
- Press the button twice before inserting new batteries.

3. LED Indicator

Red LED

- Turns ON briefly: Transmitting signal.
- Quick flash: Alarming.
- Flashes every second: In Alarm Silence Mode.
- Flashes every 2 seconds: Under warmup and calibration process.

Amber LED

- Flash every second: Device power on/Calibration failed.
- Flashes every 5 seconds: Auto-calibration/self-diagnostic has failed.
- Flashes every 45 seconds: Low battery condition

Both Red and Amber LED (Orange when looking from the outside)

- Turns ON: Temperature/ Humidity sensor failed.
- Flashes every 4 seconds: Battery exhausted.

4. Buzzer

5. Mounting Holes (for Hooks)

The Hooks of the Mounting Bracket can hook into this Mounting Hole.

6. Mounting Bracket

7. Internal Tamper

8. Battery Compartment Cover

9. Battery Switch

10. Pre Punched Hole for Wiring

Features

● *Battery and Low Battery Detection*

- The SDCO-1-RhTH-ZW-SC-AC model uses AC 100-240V as its power source and has three 600mAh AAA Ni-MH rechargeable batteries as its backup battery in case of power failure. The battery is included in the package.
- When the rechargeable battery is charging, the SDCO will report its battery percentage to the Gateway/Control Panel respectively at 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, and 100%.
- If an AC power failure is detected, the SDCO will send an AC failure report to the Control Panel.
- When the SDCO is low on battery, a low battery signal will be transmitted along with regular signal transmissions. The Amber LED will flash with accompanying low-volume beep once every 45 seconds.
- Both Red and Amber LED will flash once every 4 seconds when the battery is exhausted.

● *Tamper Switch*

- The SDCO is protected by a tamper switch which is compressed when the SDCO is hooked onto the mounting bracket. When the SDCO is removed from the mounting bracket, the tamper switch will be activated and the SDCO will send a tamper open signal to the system control panel to remind the user of this condition.
- The SDCO will send a tamper close signal to the Control Panel after the device is hooked onto the mounting bracket. Please note that the SDCO has to be included in the Z-Wave network first.

● *Adding Device (Inclusion)*

This product can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufactures 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.

- To add the SDCO into the Control Panel, you have to connect it to AC (mains) power first. Please follow below steps to proceed.

Step 1. Before you start, find the circuit breaker or fuse box.
Step 2. Once you have found it, open the door and turn off the main power switch.
Step 3. Two Wago 221 Splicing Connectors are provided. Take out one connector. Pull the lever up and insert the white wire.
Step 4. Push the lever back down. The transparent housing allows you to check if the wire is connected properly. **Make sure the wire is properly connected before you proceed.**

Figure 1

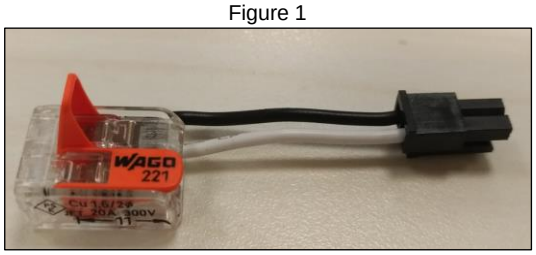
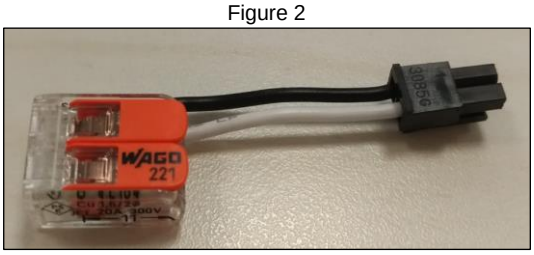


Figure 2



Step 5. Repeat Step 3 and Step 4 to insert the black wire. Insert the white and black wire to the same side (right) as shown below, of the two connectors allows you an easier installation in the following steps.
Step 6. Insert the AC wires to the two connectors respectively, as shown below. If you turn the Battery Switch to ON position, the rechargeable battery will begin to charge.

Figure 3

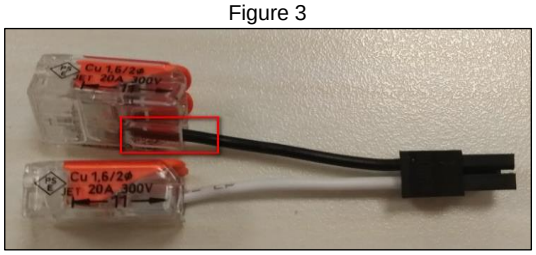
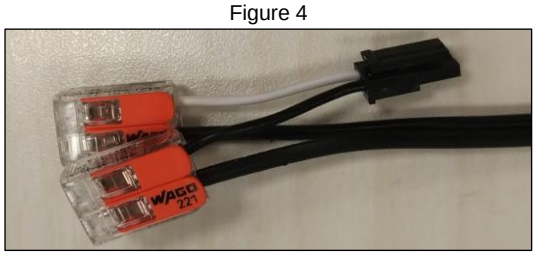


Figure 4



Step 7. Turn the SDCO over. You will hear "Welcome, Smoke Alarm and Carbon Monoxide Detector", indicating it is ready for further setup (for serial connected models only).

- The SDCO allows users to set up a location prompt for an area, to view the full list of locations and setup instructions, please refer to "***Voice Prompt***" Section for details. It is recommended to perform warm-up and calibration process **before** including your device into the Z-Wave coordinator.

<Warm-up and calibration>

1. The SDCO Detector will emit 2 short beeps, and begin warm up process for **1** minute. LED will flash every 2 seconds.
2. When 1-minute warm up period expires, the SDCO Detector will emit a beep to indicate it now enters calibration process. The calibration process takes 1~7 minutes; the LED will continue to flash during calibration.
3. When calibration is complete, the SDCO Detector will emit a 2-tone sound and LED will stop flashing to indicate it is now under normal operation. If calibration fails, the SDCO Detector will sound continuous beeps.

<Including to the Z-Wave coordinator>

1. Put the Z-Wave gateway or control panel into Inclusion mode (please refer to the Z-Wave gateway or control panel manual).
2. Within 1.5 seconds, press the button 3 times.
3. Refer to the operation manual of the Z-Wave gateway or control panel to complete the inclusion process.
4. If the sensor has already been included into another Z-Wave Gateway/Control Panel, or if the sensor is unable to be included into the current Z-Wave Gateway/Control Panel, please exclude it first (see Exclusion) before attempting to include it into the current Z-Wave Gateway/Control Panel.

● *Removing Device (Exclusion)*

The SDCO must be removed from existing Z-Wave network before being included into another.

- Put the Z-Wave gateway or control panel into Exclusion mode (please refer to the Z-Wave gateway or control panel manual).
- Within 1.5 seconds, press the button 3 times and the SDCO will be removed from the Z-Wave network.

● *Voice Prompt (for serial connection models)*

The SDCO allows the user to set up a location prompt for an area (i.e. kitchen or basement). When an alarm is triggered, the SDCO will play the pre-programmed voice prompt to alert the user to evacuate. For first time setup, please follow the steps below:

Step 1. Turn on the battery switch.
Step 2. Prompt #1 “Welcome, Smoke Alarm and Carbon Monoxide Detector” will be played.
Step 3. Prompt #2 “No location programmed” will be played.
Step 4. Prompt #3 “To select location, press and hold the button now” will be played.
Step 5. Keep holding the button and prompt #4 “To program location, press and hold the button after location is heard” will be played.
Step 6. Keep holding the button and prompt #6 “Location” will be played followed by locations for selection (from Prompt #11-31).
Step 7. To setup a desired location prompt, simply release the button.
Step 8. The device will play prompt #7 “Programmed” after you release the button and emit 2 beeps for confirmation.

No	Voice Prompt	Condition
1	Welcome, Smoke Alarm and Carbon Monoxide Detector	Played when the device is powered on.
2	No location programmed	Played for first time setup.
3	To select location, press and hold the button now.	Played for location setup.
4	To program location, press and hold the button after location is heard.	Played for location setup.
5	No location programmed	Played for location setup.
6	Location	Played for location setup.
7	Programmed	Played for location setup.
8	Emergency, Carbon Monoxide in [location name].	Played when an alarm is triggered.
9	Emergency, Smoke in [location name].	Played when an alarm is triggered.
10	Evacuate	Played when an alarm is triggered.
11	Basement	Played for location selection.
12	Hall	Played for location selection.
13	Office	Played for location selection.
14	Master Bedroom	Played for location selection.
15	Bedroom	Played for location selection.
16	Guest Bedroom	Played for location selection.
17	Kitchen	Played for location selection.
18	Dining Room	Played for location selection.
19	Living Room	Played for location selection.
20	Laundry	Played for location selection.
21	Attic	Played for location selection.
22	Nursery	Played for location selection.
23	Bathroom	Played for location selection.
24	Utility Room	Played for location selection.
25	Closet	Played for location selection.
26	Loft	Played for location selection.
27	Basement Living Room	Played for location selection.
28	Staircase	Played for location selection.
29	Garage	Played for location selection.
30	Rental Apartment	Played for location selection.
31	No Location	Played when no location is selected.

- When a CO, smoke, and/ or temperature alarm is triggered, the siren will be activated according to the time length below and followed by voice prompts to notify the user to evacuate.

Alarm Type	Alarm and Voice Warning Pattern	Condition
Smoke/Heat	**(Repeat)** Beep---Beep---Beep------Beep---Beep---Beep Emergency, Smoke in [location name]. Location. Evacuate.	Played after the intermittent warning sound when a smoke or heat alarm is triggered. Please note the location prompt will be played according to the preprogrammed location name.
CO	**(Repeat)** Beep-Beep-Beep-Beep Emergency, Carbon Monoxide in [location name]. Location. Evacuate.	Played after the intermittent warning sound when a Carbon Monoxide alarm is triggered. Please note the location prompt will be played according to the preprogrammed location name.
Smoke/Heat+CO	**(Repeat)**	Played after the intermittent warning sound when a smoke/heat, and Carbon Monoxide

	Beep---Beep---Beep---Beep-Beep-Beep-Beep----- Beep---Beep---Beep Emergency, Smoke in [location name]. Location. Evacuate. Emergency, Carbon Monoxide in [location name]. Location. Evacuate.	alarm is detected. Please note the location prompt will be played according to the preprogrammed location name.

● *Alarm Detection*

The SDCO Detector will activate fire alarm when either of its smoke detection or high heat detection function is triggered. When an alarm is activated, the SDCO Detector will transmit alarm signal and raise alarm with its built in buzzer, the Red LED will flash rapidly.

Smoke Detection:

- The SDCO Detector checks smoke concentration every 8 seconds
- Whenever the smoke concentration exceeds the detection threshold, SDCO will send active signal to the Control Panel, and activate the alarm.
- If the smoke concentration persists, the SDCO Detector will continue to send the active signal every minute to the Control Panel.
- If no smoke is detected for 20 continuous detection times, the SDCO will transmit a restore signal.

Heat Detection:

- The SDCO Detector checks temperature every 10 seconds.
- The alarm will be activated in the following conditions:
  - When the temperature rises by 8.25°C per minute (Rate of Rise).
  - When the temperature exceeds 57.25°C (High Heat).
- If no high heat is detected for 16 continuous detection times, the SDCO will transmit a restore signal.
- If the alarm was triggered by High Heat condition (57.25°C), the temperature must drop below 49°C for detector to stop alarming.

Carbon Monoxide Detection:

- The CO sensor will check the CO concentration level every 16 seconds, if the concentration level exceeds the detection threshold, the SDCO Detector will transmit alarm signal and raise alarm with its built in buzzer.
- The CO sensor features self-diagnosis function and will regularly check the health or status of the sensor every 12 hours.
- The alarm will be activated after CO concentration is detected according to time length in the following table: (compliant with EN-50291 standard)

CO concentration level	Time taken before alarming
30 +/- 10% ppm	N/A
50 +/- 10% ppm	60~90 minutes
100 +/- 10% ppm	10~40 minutes
300 +/- 10% ppm	Under 3 minutes

- The alarm will be activated after CO concentration is detected according to time length in the following table: (compliant with UL-2034 standard)

CO concentration level	Time taken before alarming
30 +/- 3% ppm	N/A
70 +/- 5% ppm	N/A
70 +/- 5% ppm	60~240 minutes
150 +/- 5% ppm	10~50 minutes
400 +/- 10% ppm	4~15 minutes

- Once the CO concentration level exceeds the threshold and persists for the time length as listed in the above table, the SDCO Detector will transmit the signal to Z-Wave coordinator and raise alarm with its built-in siren.
- If CO drops below 30ppm for 10 continuous detection times, the SDCO will transmit a restore signal.

Temperature and Humidity Detection:

The Temperature and Humidity Sensor will transmit temperature and humidity signals regularly according to setting. The factory default interval is 30 to 33 minutes.

- The SDCO Detector will send temperature signal when temperature changes by +/- 2°C.
- You can also press the button once to transmit a temperature signal manually.

● *Testing the SDCO Detector*

By pressing the button on the SDCO Detector, you can test if the SDCO is functioning normally.

- If the SDCO Detector functions normally, the Red LED will flash once followed by a 2-tone beep.
- If three 2-tone beeps (DO-DI DO-DI DO-DI) are emitted, it means the Smoke Sensor is out-of-order.
- If 5 beeps (DO-Bi-Bi-Bi-DO) are emitted, it means the Heat Sensor is out-of-order.
- If 7 beeps (Bi-Bi-Bi-DO-Bi-Bi-Bi) are emitted, it means the CO Sensor is out-of-order.

● *Alarm Silence*

- There are two ways to manually put the SDCO into Alarm Silence mode: pressing the button. By either method, the SDCO will enter Alarm Silence mode. After the period, a restore signal will be sent. Please refer to page 7 "***Smoke Emergency Cleared, Heat Emergency Cleared, and CO Emergency Cleared"*** section for details.

Pressing the Button:

- When the Smoke Detector is alarming, pressing the button will put the Smoke Detector into Alarm Silence mode to silence the alarm.
- During the Alarm Silence period, the Red LED will flash once per second. The Smoke Detector will continue to monitor smoke concentration during the alarm silence period:
  1. After the Alarm Silence period has expired, if the smoke concentration has dropped below alarm threshold, the Smoke Detector will emit a 2-tone beep and return to normal operation without sounding alarm.
  2. If smoke concentration still exceeds alarm threshold, the Smoke Detector will start alarming again.

3. If smoke concentration continues to rise during Alarm Silence period and exceeds a second alarm threshold, the SDCO will start alarming again. An alarm activated by exceeding the second alarm threshold could not be silenced by pressing the button.

● *Recalibration*

The SDCO will calibrate its smoke detector sensor every time when power is applied to ensure optimal smoke sensitivity. After installation, the operation condition of the Smoke Detector may vary after some time, which may affect its smoke detection function and requires recalibration. There are two ways to recalibrate the Smoke Detector: auto calibration and manual calibration.

Auto Calibration:

- After power up, the Smoke Detector will perform auto-calibration after 4 hours.
- After the first auto-calibration, the Smoke Detector will perform auto calibration every month. During the auto-calibration process, the Smoke Detector will not emit any sound.
- If auto-calibration fails, the Amber LED will flash every second along with continuous beeps.
- When Smoke Detector auto calibration fails, the smoke alarm function will still work normally using the threshold value taken from the last successful calibration.

Manual Calibration:

- Manual calibration can be performed any time as desired:

1. Press and hold the button for 10 seconds and release when the Smoke Detector emits 2 beeps.
2. The Smoke Detector will enter calibration process. The LED Indicator will flash every 2 seconds.
3. After the Smoke Detector finishes recalibration, it will emit two quick beeps to indicate. The LED will turn off.
4. If calibration process fails, Smoke Detector will emit alarm sound. Please remove and reinsert battery to restart process again.

● *Inditifying the Device*

The function is available for you to identify the SDCO among your devices by sending Z-Wave commands to the Gateway. If the device receives signal successfully, the device LED will begin to flash. The number of flashing cycles is programmable by using Z-Wave Indicator CC commands. Please refer to "***Command Class Data Format"*** section for details.

● *Factory Reset*

(Only use factory reset when network Control Panel/Gateway is missing or inoperable).

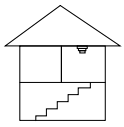
- Press and hold the button of the SDCO for 20 seconds. Release the button when you hear 3 beeps to perform factory reset.

<NOTE>

☞ Factory resetting the SDCO will restore it to factory default settings (excluded from the Z-Wave network). The Z-Wave gateway or control panel will still keep its Z-Wave settings. Please refer to the gateway or control panel manual on how to remove the SDCO's Z-Wave settings.

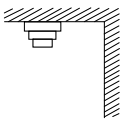
Installation

● *Installation Guideline*



At the top of a stairway

- It is recommended that the installation site be in the center area of the ceiling.
- The ideal mounting height for the SDCO Detector is 2.4 meters to 3 meters. Mounting above 3 meters can affect detection performance.
- Do not install the detector in the following locations:
  - The Kitchen – Smoke from cooking might cause an unwanted alarm.
  - Near a ventilating fan, fluorescent lamp or air-conditioning equipment – air drafts from them may affect the sensitivity of the detector.
  - Near ceiling beams or over a cabinet – stagnant air in these areas may affect the sensitivity of the detector.
  - In the peak of an "A" frame type of ceiling.



At least 60 cm from the wall

● *Installation Recommendation*

- **Limitations**
  - Do not install the SDCO Detector exposed to direct sunlight.
  - Avoid installing the SDCO Detector in areas where devices may cause rapid change of temperature in the detection area, i.e. air conditioner, heaters, etc.
  - Avoid large obstacles in the detection area.
  - Do not point directly at sources of heat e.g. Fires or boilers, and not above radiators.

● *Mounting the SDCO Detector*

Step 1. Before you start, find the circuit breaker or fuse box.
Step 2. Once you have found it, open the door and turn off the main power switch.
Step 3. Place the SDCO Detector at desired mounting location and make sure the SDCO can be received by the Control Panel at mounting location.
Step 4. Two Wago 221 Splicing Connectors are provided. Take out one connector. Pull the lever up and insert the white wire.
Step 5. Push the lever back down. The transparent housing allows you to check if the wire is connected properly. **Make sure the wire is properly connected before you proceed.**

Figure 1

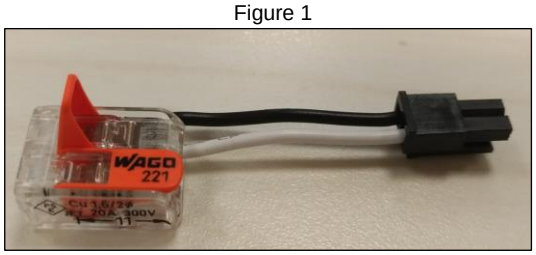
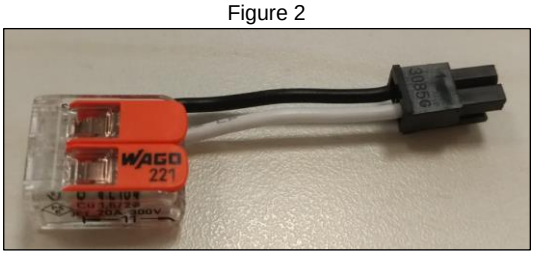


Figure 2



Step 6. Repeat Step 4 and Step 5 to insert the black wire. Insert the white and black wire to the same side (right) as shown below, of the two connectors allows you an easier installation in the following steps.

Step 7. Insert the AC wires to the two connectors respectively, as shown below.

Figure 3

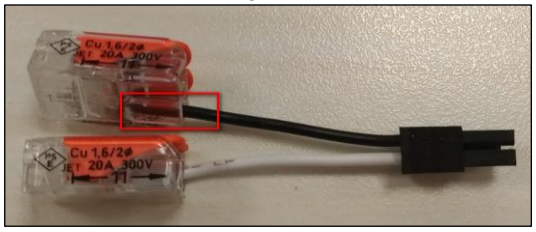
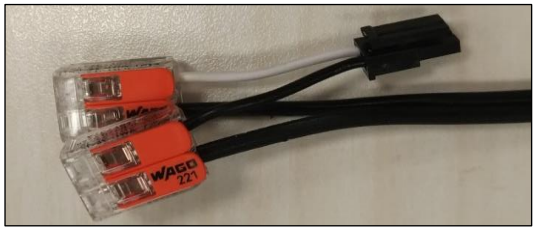


Figure 4



Step 8. The SDCO Detector has a mounting bracket for ceiling installation. Use the holes on the bracket as template; mark the mounting location on ceiling.

Step 9. Screw the mounting bracket onto the ceiling according to the marked locations, drill holes in and insert wall plugs if required.

Step 10. Wipe away dust thoroughly, or it can make the sensor dirty and prevent it from operating properly in case of an emergency.

Step 11. Remove the battery compartment cover and attach the cable to the PCB board of SDCO. The foolproof design provides an easy installation procedure, as shown below.

Figure 5

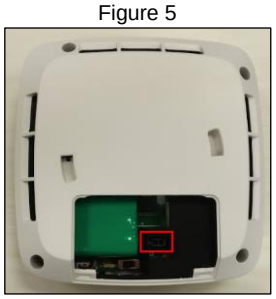
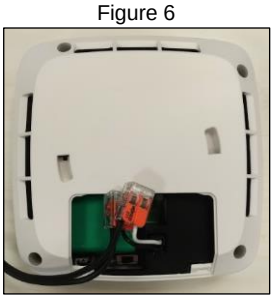


Figure 6



Step 12. Put the two Splicing Connectors in the space next to the rechargeable battery as shown below.

Step 13. Replace the battery compartment cover in its proper place. The pre-punched hole on the cover enhances its flexibility.

Figure 7

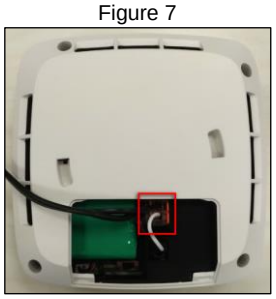
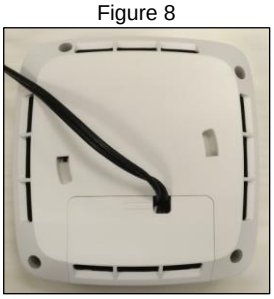


Figure 8



Step 14. Align the mounting holes on the SDCO Detector with the hooks on the mounting bracket. Fit the SDCO Detector onto bracket and rotate clockwise to lock the hook.

Step 15. Installation is now complete. Turn on the main power switch for further operation.

Z-Wave Information

Device Type: Sensor Notification Smoke Alarm
Role Type: Always On Slave (AOS)

Max Association Group: 2

Command Class Support/Control

Mandatory CC Support:
Z-Wave Plus Info CC
Association CC, (S2)
Multi Channel Association CC, (S2)
Association Group Information CC, (S2)
Transport Service CC
Version CC, (S2)
Manufacturer Specific CC, (S2)
Device Reset Locally CC, (S2)
Power Level CC, (S2)
Battery CC, (S2)
Security 2
Notification CC, (S2)
Sensor Multilevel CC, (S2)
Supervision CC, (S2)
Firmware Update Md CC, (S2) (for OTA model)

- ***Z-Wave's Groups (Association Command Class Version 2)***

Group 1 for "LifeLine": (maximum node: one)
Battery CC (COMMAND_CLASS_BATTERY)
Notification CC,V8 (COMMAND_CLASS_NOTIFICATION)
Sensor Multilevel CC, V11 (COMMAND_CLASS_SENSOR_MULTILEVEL)
Device Reset Locally CC (COMMAND_CLASS_DEVICE_RESET_LOCALLY)

Group 2 for "Basic set": (maximum node: one)
Basic CC (COMMAND_CLASS_BASIC)

- When the Smoke Detector is active, it will send Basic Set (0xFF) in Group 2.
- When the Smoke Detector is restored, it will send Basic Set (0x00) in Group 2.

- ***Command Class Data Format***
  - **AC Failure/Restore: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
    - When an AC power failure is detected, the SDCO will send an AC failure signal to the Control Panel. When AC power is restored, the SDCO will send a restore signal to the Control Panel.
    - AC Failure: 00 00 00 FF 08 02 00
    - AC Restore: 00 00 00 FF 08 03 00
  - **Battery: [COMMAND_CLASS_BATTERY] [BATTERY_REPORT]**
    - 0x64 --- 100% Battery Full
    - 0x5A --- 90% Battery
    - 0x50 --- 80% Battery
    - 0x46 --- 70% Battery
    - 0x3C --- 60% Battery
    - 0x32 --- 50% Battery
    - 0x28 --- 40% Battery
    - 0x1E --- 30% Battery
    - 0x14 --- 20% Low Battery
    - 0xFF --- Battery Dead (Cut Off)
    - Cut Off --- The device will stop working and both Red and Amber LEDs will flash every 4 seconds.
    - If the battery switch is set as OFF, the SDCO will send 00% to notify the user. Please note when set as OFF, the battery will not be charged when AC power is connected and nor will it serve as a backup power source when AC power is missing.
    - When AC power is applied, the rechargeable battery will be charging at the same time, and the SDCO will report its battery percentage to the Gateway/Control Panel respectively at 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, and 100%.
    - When AC power is removed or power failure takes place, the SDCO will use its built-in rechargeable battery and report its battery percentage. After AC power is reapplied, the SDCO will report its battery percentage detected. When the battery voltage detected is 4.3V or above, the SDCO will report its battery percentage at 60% and begin to charge the battery. When the battery voltage detected is under 4.3V, the SDCO will report its battery percentage respectively and begin to charge the battery.

  - **Temperature/Humidity Report: [COMMAND_CLASS_SENSOR_MULTILEVEL] [SENSOR_MULTILEVEL_REPORT]**
    - The user can press the button once to send temperature and humidity information to the Control Panel.

- Temperature: 01 42 09 D1
- If temperature signal 01 42 **09 D1** is transmitted:
  09D1 can be viewed as 0x**09D1** in Hexadecimal number. You can convert hexadecimal to decimal and divide by 100 to check the temperature data (in Celsius).
  0x09D1=2513=25.13℃.
- Humidity: 05 02 00 3B
- If humidity signal 05 02 **00 3B** is transmitted:
  003B can be viewed as 0x**003B** in Hexadecimal number. You can convert hexadecimal to decimal to check the humidity level (in percentage).
  003B=0x003B=59%

- **Smoke Alarm Test: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
  - The user can press the button once to send smoke alarm test report to the Control Panel.
  - Smoke Alarm Test: 00 00 00 FF 01 03 00
  - 01=alarm type; 03=smoke alarm test
- **Smoke Emergency/Smoke Emergency Cleared: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
  - Smoke Alarm: 00 00 00 FF 01 02 00
  - A smoke alarm will be activated after the smoke concentration exceeds the detection threshold, or either manually activated by sending commands, the SDCO can be silenced and enter Alarm Silence mode. Please refer to "***Alarm Silence**" section for details.* The SDCO will send an alarm silence report in the following three conditions:
  - When the smoke concentration has dropped below alarm threshold, the SDCO will send: 00 00 00 FF 01 06 01 01
  - When the user presses the button to stop the alarm, the SDCO will send: 00 00 00 FF 01 06 01 02
  - When the user sends a siren off command to stop the alarm, the SDCO will send: 00 00 00 FF 01 06 01 03
    Please refer to "**Siren On/Off Control Command**" for details.
  - Note: If multiple alarms are activated, the alarm silence events will be sent respectively.
  - After the SDCO is silenced, if no smoke is detected for 20 continuous detection times, the SDCO will transmit a restore signal: 00 00 00 FF 01 00 01 02.
- **Heat Emergency/Heat Emergency Cleared: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
  - Heat Alarm: 00 00 00 FF 04 02 00
  - A heat alarm will be activated after the SDCO meets the Rate of Rise or High Heat condition, or either manually activated by sending commands, the SDCO can be silenced and enter Alarm Silence mode. Please refer to "***Alarm Silence**" section for details.* The SDCO will send an alarm silence report in the following three conditions:
  - When the temperature has dropped below alarm threshold, the SDCO will send: 00 00 00 FF 04 09 01 01
  - When the user presses the button to stop the alarm, the SDCO will send: 00 00 00 FF 04 09 01 02
  - When the user sends a siren off command to stop the alarm, the SDCO will send: 00 00 00 FF 01 06 01 03
    Please refer to "**Siren On/Off Control Command**" for details.
  - Note: If multiple alarms are activated, the alarm silence events will be sent respectively.
  - After the SDCO is silenced, if no high heat is detected for 16 continuous detection times, the SDCO will transmit a restore signal: 00 00 00 FF 04 00 01 02
- **CO Emergency/CO Emergency Cleared: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
  - CO Alarm: 00 00 00 FF 02 02 00
  - A CO alarm will be activated after the CO concentration exceeds the detection threshold, or either manually activated by sending commands, the SDCO can be silenced and enter Alarm Silence mode. Please refer to "***Alarm Silence**" section for details.* The SDCO will send an alarm silence report in the following three conditions:
  - When the CO concentration has dropped below 30ppm, the SDCO will send: 00 00 00 FF 02 06 01 01
  - When the user presses the button to stop the alarm, the SDCO will send: 00 00 00 FF 02 06 01 02
    Please note an alarm activated by exceeding the second alarm threshold CANNOT be silenced by pressing the button.
  - When the user sends a siren off command to stop the alarm, the SDCO will send: 00 00 00 FF 01 06 01 03
  - Note: If multiple alarms are activated, the alarm silence events will be sent respectively.
  - After the SDCO is silenced, if CO drops below 30ppm for 10 continuous detection times, the SDCO will transmit a restore signal: 00 00 00 FF 02 00 01 02
- **Tamper Open/Close report: [COMMAND_CLASS_NOTIFICATION] [NOTIFICATION_REPORT]**
  - The SDCO is protected by a tamper switch which is compressed when the SDCO is hooked onto the mounting bracket. When the SDCO is removed from the mounting bracket, the tamper switch will be activated and the SDCO will send a tamper open signal to the system control panel to remind the user of this condition.
  - Tamper Open : 00 00 00 07 03 00
  - Tamper Close: 00 00 00 07 00 01 03