

Shutter Control (SCM-1ZBS)

Introduction

SCM-1ZBS is a ZigBee Shutter Control. The user can control the SCM via ZigBee network at a remote distance or manually by linking a switch to the Shutter Control.

The Shutter Control utilizes ZigBee technology for wireless signal transmission. ZigBee is a wireless communication protocol that is reliable, has low power consumption and has high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and coordinated for data exchange and signal transmission.

The Shutter Control serves as an end device in the ZigBee network. It can be included in the ZigBee network to transmit or receive signal, but cannot permit any other ZigBee device to join the network through the Shutter Control.

Parts Identification

1. LED indicator

The LED indicator is used to indicate Shutter Control status:

- Flashes once: The Shutter Control has reset.
- Flashes twice: The Shutter Control has successfully joined a ZigBee network.
- Flashes once every 20 minutes: The Shutter Control has lost connection to its current ZigBee network.

2. Function Button

- Press once: Transmit a supervision signal.
- Press and hold for 3~10 seconds: Enter calibration mode.
- Press and hold for 10 seconds: Reset the Shutter Control to join ZigBee network.

3. Insertion Hole Clipper Opener

Press the button to open the clipper of the respective insertion hole

4. Wire Insertion Holes (With clippers)

5. Power Input Terminal L (Live Lead)

6. Power input Terminal N (Neutral Lead)

7. Local Switch Terminal S1 (Open Direction)

Connect an external switch to this terminal. Activate this switch to control the shutter to roll toward "Open" direction by activating the Motor Output O1. Activating this switch when the shutter is rolling towards the "Close" direction will stop the shutter.

8. Local Switch Terminal S2 (Close Direction)

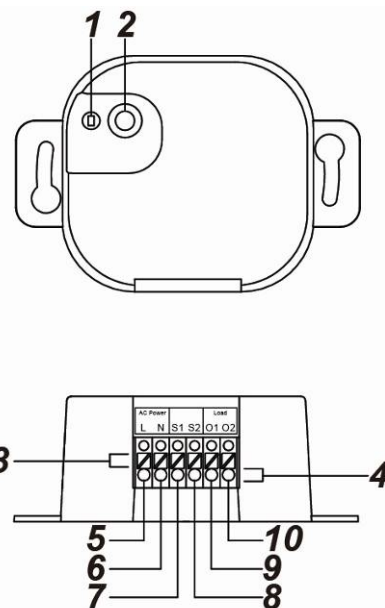
Connect an external switch to this terminal. Activate this switch to control the shutter to roll toward "Close" direction by activating the Motor Output O2. Activating this switch when the shutter is rolling towards the open direction will stop the shutter.

9. Motor Output O1 (Open Direction)

Connect to the Open terminal of the Shutter Motor.

10. Motor Output O2 (Close Direction)

Connect to the Close terminal of the Shutter Motor.



ZigBee Network Setup

● ZigBee Device Guideline

ZigBee is a wireless communication protocol that is reliable, has low power consumption and has high transmission efficiency. Based on the IEEE802.15.4 standard, ZigBee allows a large amount of devices to be included in a network and are coordinated for data exchange and signal transmission.

● **Joining the ZigBee Network**

As a ZigBee device, the Shutter Control needs to join a ZigBee network to receive commands. Please follow the steps below to join the Shutter Control into a ZigBee network.

1. Connect the power cable to AC Input connector on Shutter Control.
2. Press and hold the function button for 10 seconds as the Shutter Control resets and starts searching for existing ZigBee network. Please make sure the permit-to-join feature on the router or coordinator of your ZigBee network is enabled.
3. If the Shutter Control successfully joins a ZigBee network, the LED Indicator will flash twice to confirm.
4. After joining the ZigBee network, the Shutter Control will be registered in the network automatically. Please check the ZigBee network coordinator, system control panel or CIE (Control and Indicating Equipment) to confirm if joining and registration is successful.
5. After joining the ZigBee network, if the Shutter Control loses connection to the current ZigBee network, the LED indicator will flash every 20 minutes. Please check your ZigBee network condition and Shutter Control signal range to correct the condition.

● **Removing Device from ZigBee Network (Factory Reset)**

To remove the Shutter Control from current ZigBee network, the Shutter Control must be put to Factory Reset to complete device removal. Factory Reset function will clear the Shutter Control of its stored setting information and prompt the device to search for new ZigBee network.

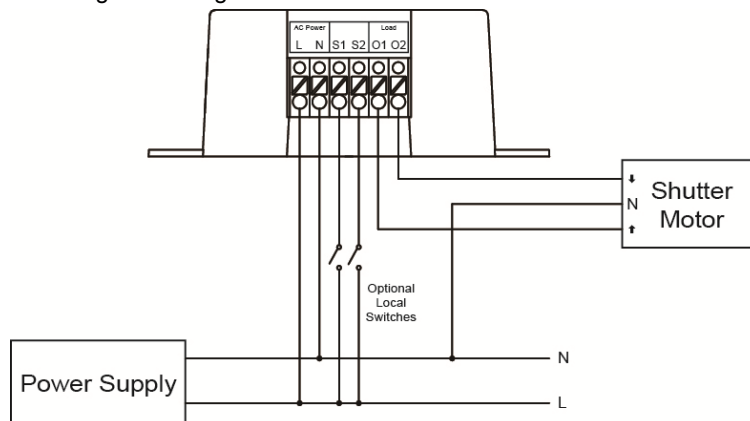
Before removing device, make sure the Shutter Control is within current ZigBee network signal range

1. Press and hold the function button for 10 seconds, then release the button to reset Shutter Control.
2. Upon reset, the Shutter Control will clear current ZigBee network setting and transmit signal to ZigBee coordinator to remove itself from current ZigBee network. It will then actively search for available ZigBee network again and join the network automatically.

Installation

Please use the recommended wire size of AWG 16-26 or \varnothing 1.31-0.129 (mm²).

Connect SCM according to the diagram below:



- Connect L terminal of SCM to the L terminal of Power Supply.
- Connect N terminal of SCM to the N terminal of Power Supply.
- Connect O1 terminal of SCM to the Open terminal of the Shutter Motor.
- Connect O2 terminal of SCM to the Close terminal of the Shutter Motor.
- **(Optional local switch)** Connect S1 and S2 terminals of SCM to the L terminal of Power Supply.

Operation

● **Calibration**

- The Shutter Control default activation time is **4** minutes. When the Up/Down button is pressed or the ZigBee network coordinator transmits Up/Down command, it will activate the Shutter Motor for 4 minutes.
- For the Shutter Control to work properly, its activation time must be calibrated. There are two ways to adjust the activation time:
 - **ZigBee Command:** The activation time can be adjusted by sending command from the ZigBee network coordinator. (See [Appendix – Level Cluster Attribute – OnTransitionTime / OffTransitionTime](#), minimum adjustable unit 100ms)

- **Manual Calibration:** Calibrate the activation according to procedure below:
 1. Before calibration, the external local switches must be connected to the Shutter Control.
 2. Press and hold the Function button for 3~10 seconds and release to enter Calibration mode. The Shutter Control will roll toward the “Open” direction for 4 minutes upon entering Calibration mode.
 3. Wait for 4 minutes for Shutter Control to stop rolling to “Open” direction, then activate the connected external local “Close” switch to close the shutter.
 4. Activate the “Open” external local switch the moment the shutter is fully closed. The Shutter control will record to time it took between step 3 and 4 as the new “close time”.
 5. The Shutter Control will roll toward open direction after step 4.
 6. Activate the “Close” external local switch the moment the shutter is fully opened. The Shutter control will record to time it took between step 5 and 6 as the new “open time”.

Example

If it takes 30 seconds for the shutter to move from Open to Close, and 40 seconds to move from Close to Open, the new **close time** will be **30** seconds and new **open time** will be **40** seconds.

After calibration, whenever the Shutter Control receives close command, it will roll toward close direction for 30 seconds. When it receives open command, it will roll toward open for 40 seconds.

- The activation time will be reset to 4 minutes whenever the Shutter Control joins a ZigBee network.

● Shutter Control

ZigBee Network

- After the Shutter Control has successfully joined a ZigBee network, the coordinator can remotely control the shutter to open, close or stop by transmitting command through ZigBee network.
- When the Shutter Control receives open/close signal from coordinator, it will roll toward open/close direction according to calibrated activation time to fully open/close the shutter.
- The Shutter status can also be adjusted by percentage from 0%, 10%, 20%... to 100% through ZigBee Coordinator.
- The current open percentage is also transmitted to ZigBee coordinator.

Local Switch

- If an optional Local Switch is connected, users can also press the switch button to open/close the shutter.
- Press and release the switch for less than 1 second will control the shutter to fully open or close.
- Press and hold the switch for more than 1 second will control the shutter to open and close until the switch is released. When the switch is released, the shutter will stop.
- Pressing the switch when the shutter is moving to opposite direction will stop the shutter. Press the switch again to open/close the shutter.

For example, pressing the down switch when the shutter is opening will stop the shutter, press down switch again to start closing the shutter.

● Maximum Operation Load

- For 110V: the maximum operation load is 440W and 4A.
- For 230V: the maximum operation load is 920W and 4A.

Appendix (For developers only)

● Power Relay Shutter Control with Meter Cluster ID

Device ID: Shade :0x0200	
Endpoint:0x01	
Server Side	Client Side
Mandatory	
Basic (0x0000)	<i>None</i>
Identify(0x0003)	
On/Off(0x0006)	
Level Control(0x0008)	
Shade Config(0x0x0100)	
Groups(0x0004)	
Scenes(0x0005)	
Optional	

None	None
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• **Attribute of Basic Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>ZCLVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x01	M
0x0001	<i>ApplicationVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x00	O
0x0003	<i>HWVersion</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0	O
0x0004	<i>ManufacturerName</i>	Character String	0 – 32 bytes	Read only	Climax Technology	O
0x0005	<i>ModelIdentifier</i>	Character String	0 – 32 bytes	Read only	(Model Version)	O
0x0006	<i>DateCode</i>	Character String	0 – 16 bytes	Read only		O
0x0007	<i>PowerSource</i>	8-bit	0x00 – 0xff	Read only		M
0x0010	<i>LocationDescription</i>	Character String	0 – 32 bytes	Read / Write		O
0x0011	<i>PhysicalEnvironment</i>	8-bit	0x00 – 0xff	Read / Write	0x00	O
0x0012	<i>DeviceEnabled</i>	Boolean	0x00 – 0x01	Read / Write	0x01	M

• **Attribute of Identify Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>IdentifyTime</i>	Unsigned 16-bit integer	0x00 – 0xffff	Read / Write	0x0000	M

• **Attribute of On/Off Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>OnOff</i>	Boolean	0x00 – 0x01	Read only	0x00	M

• **Attribute of Level Cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>CurrentLevel</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x00	M
0x0012	<i>OnTransitionTime</i>	Unsigned 16-bit integer	0x0000 – 0xFFFF	Read / Write	0x0960	O
0x0013	<i>OffTransitionTime</i>	Unsigned 16-bit integer	0x0000 – 0xFFFF	Read / Write	0x0960	O

• **Attributes of the Shade cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0002	<i>Status</i>	8-bit bitmap	0000xxxx B	Read / Write	00000000 B	M
0x0010	<i>ClosedLimit</i>	Unsigned 16-bit integer	0x0001 – 0xfffe	Read / Write	0x0001	M
0x0011	<i>Mode</i>	8-bit Enumeration	0x00 – 0xfe	Read / Write	0x00	M

• **Attributes of the Groups cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>NameSupport</i>	8-bit bitmap	x0000000	Read only	-	M

• **Attributes of the Scenes cluster Information**

Identifier	Name	Type	Range	Access	Default	Mandatory / Optional
0x0000	<i>SceneCount</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x00	M
0x0001	<i>CurrentScene</i>	Unsigned 8-bit integer	0x00 – 0xff	Read only	0x00	M
0x0002	<i>CurrentGroup</i>	Unsigned 16-bit integer	0x0000 – 0xffff7	Read only	0x00	M
0x0003	<i>SceneValid</i>	Boolean	0x00 – 0x01	Read only	0x00	M
0x0004	<i>NameSupport</i>	8-bit bitmap	x0000000	Read only	-	M

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- . Reorient or relocate the receiving antenna.
- . Increase the separation between the equipment and receiver.
- . Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- . Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example – use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.