



### Black Cat Lite 1 Relay (BCL1)

Product Code	Z Wave Frequency
ZWBCL1-AUS	921.4
ZWBCL1-EURO	868.4
ZWBCL1-USA/Canada	908.4
ZWBCL1-JP	922.5

The **Black Cat LITE 1** is an in-wall switch module that is a transceiver which is a security enabled module. Communication is based on Z-Wave Plus technology, and it is fully compatible with any Z-Wave™ enabled network.

The mini size design of the module enables the module to be easily concealed into a wall box or cavity. The BCL1 supports the Security Command Class and is able to learn with a secured controller. Its functionality and supported command classes are identical when included as a secure and non-secure module.

There are many different kinds of application for this module to switch a Load On or Off. One main application is a light control. If the **COM** terminal is directly connected to the AC Line terminal, the new smart relay calibration technology can reduce the inrush current caused by the load and let the module work perfectly with many kinds of light such as incandescent, fluorescent and LED light.

This module can also connect to Alternative power supplies like DC 12V to switch on/off a 12V Load.

#### Supported Switches.

The module supports mono-stable switches (push button) and bi-stable switches (On/Off).

The module is factory set to operate with bi-stable switches in Edge mode.

#### Important ..... Danger of electrocution!

- This module installation requires a great degree of skill and may be performed only by a qualified and licensed electrician. The Warranty may be voided if not installed by a Qualified REC/Installer.
- Even when the module is turned off, voltage may be present on its terminals. Any works on configuration changes related to connection mode or load must be always performed by disconnected power supply (disable at the fuse box).

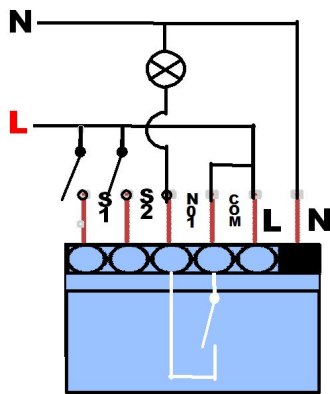
#### Installation

- Before installation, choose a suitable location avoiding facing direct sunlight, humid or dusty environments. Suitable ambient Temperature is 0-40°C and do not locate where combustible substances or any source of heat is present. i.e. fires, boilers, radiators etc.
- Disconnect and isolate the power supply.
- Connect the module according to electrical diagram.
- Locate the antenna far from metal elements (as far as possible).
- Do not shorten the antenna.
- After putting it into service, the body of Switch will become warm to touch, this phenomenon is normal.

#### Note!

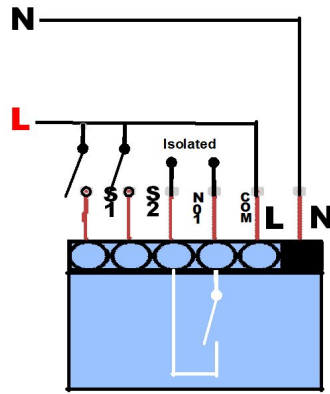
Do not connect the module to loads exceeding recommended values. Connect the module only in accordance to the below diagrams. Improper connections may be dangerous and may result in damage to the module.

Electrical Diagram for 240V AC

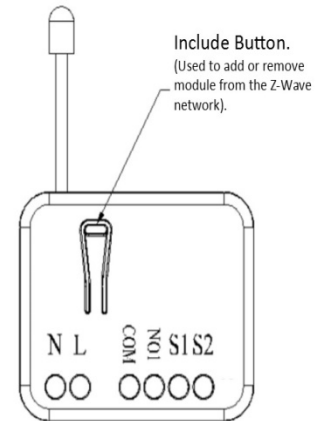


COM Input for Electrical device power supply  
 NO1 Output for Electrical device  
 S2 Input for switch /push button or sensor  
 S1 Input for switch /push button  
 N Neutral lead  
 A Active lead

Alternative Electrical Diagram for 240V AC



Note: If the COM terminal is directly connected to L (Line terminal), smart relay calibration technology can reduce the inrush current caused by the load and let the module work perfectly with many different types of light.



### Module Inclusion Adding to Z-Wave™ Network.

On the front casing, there is an on/off button (Include Button) with LED indicator below which is used to toggle the switch on and off or carry out the inclusion, exclusion, reset or association process. When first power applied, its LED flashes on and off alternately and repeatedly at 0.5 second intervals. It implies that it has not been assigned a node ID and starts Auto Inclusion.

The function of Auto Inclusion will be executed as long as the in wall switch does not have Node ID and has just been connected to the mains power.

**Note:** Auto inclusion timeout is 2 minutes during which the node information of the explorer frame will be emitted once every several seconds. Unlike the “inclusion” function as shown in the table below, the execution of auto inclusion is free from pressing the On/Off button on the Switch.

### LED Indicators.

State Type	LED Identification
Normal	Whenever the device is switched ON or OFF by S1 or S2, the ON/OFF button or RF command, the LED will light up when the device is switched ON
No Node ID	Under normal operation, where the device has not been allocated a node ID, the LED flashes on and off alternately at 2 second intervals. By pressing S1 or S2 or the ON/OFF button, it will stop flashing temporarily.
Learning	When the device is in learning mode, the LED flashed on and off at second intervals.
Overload	When overload state occurs, the device is disabled and the LED flashes on and off at second intervals. Overload state can be cleared by disconnecting and reconnecting the device to Mains power.

### Installation.

- Connect module to power supply
- Enable add/remove mode on main controller
- Auto-inclusion timeout is 2 minute after connected to power supply or
- Press Include button for more than 2 second or
- Press push button S1 three times within 3s (3 times change switch state within 3 seconds).

NOTE 1: For auto-inclusion procedure, first set main controller into inclusion mode and then connect module to power supply.

The table below lists the operation summary of basic Z-Wave functions. Please refer to the instructions for your Z-Wave™ Certified Primary Controller to access the Setup function, and to include/exclude or associate the module.

Function	Description	Indication
No Node ID	The Z-Wave Controller does not allocate a node ID to the Switch	LED 2 Second on, 2Second off
Inclusion	1. Put your Z-Wave controller into Inclusion Mode by following the instructions provided by the controller manufacturer. 2. Press the Include button 3 times within 2 seconds will enter Inclusion Mode.	One press, one flash LED
Exclusion	1. Put your Z-Wave controller into Exclusion Mode by following the instructions provided by the controller manufacturer. 2. Press the Include button 3 times within 2 seconds will enter Exclusion Mode.  Node ID has been excluded.	0.5s On, 0.5s Off & enters Auto Inclusion Mode
Reset	1. Press the Include button 3 times within 2 seconds will enter Exclusion Mode. 2. Within 1 second, press Include button for 5 seconds. 3. Node ID is excluded.	Use this procedure only id Primary controller is lost or wise inoperable. 0.5s On, 0.5s Off & enters Auto Inclusion Mode
Association	1. The Module isan always listening Z-wave device. Associations may be added or removed by a controller at any time. Or If your controller requires to have the Module to send a Node Information Frame for Associations, then press the On/Off Button 3 times within 2 seconds. 2. There is only 1 Association group for this device.	

## 1. Z-Wave's Groups (Association Command Class Version 2)

The Switch can be set to send reports to associated Z-Wave modules. It supports only one association group and the group has one node support.

Group 1 support SWITCH\_BINARY\_REPORT

For group 1, the Switch will report ON/OFF status of Relay to controller.

### 2-1 Auto report to Grouping 1 (Maximum Node 1)

#### 2-1-1 On/Off Event Report

When an "on" or "off" state has changed (such as Pressing S1, S2 or include on/off button), it will send Binary Switch Report to the nodes of Group1.

Binary Switch Report

ON:[Command Class Switch Binary, Switch Binary Report, Value=(255)0xFF]

OFF:[Command Class Switch Binary, Switch Binary Report, Value=0(0x00)]

#### 2-1-2 Overload alarm report command

When Module detects an overload, it will send Alarm Report to the node of Group1.

The content of Alarm Report

Alarm report command:[Command Class Alarm, Alarm Report, Alarm Type= 0x08, Alarm Level = 0xFF]

## Configuration Parameters.

Configuration Parameter	Function	Size (Byte)	Value	Unit	Default	Description
1	Switch	1	1 to 3		1	1 2 3
2	Restore Switch state mode	1	0 to 2		1	0: Switch Off 1:Last Switch State 2:Switch On
3	Manual On/Off mode	1	0 to 1		1	0:Disable manual On/Off 1:Enable manual On/Off
4	LED Indication mode	1	1 to 3		1	1:Show switch state. 2:Show night mode 3One flash mode
5	Auto Delay	1	0-0x7FFF	Second	0	0: Disable Auto Delay seconds 1-0x7FFF: 1 to 32767 seconds
6	RF Off command mode	1	0 to 3		0	0:Switch off 1:Ignore 2:Switch toggle 3:Switch on

### 3-1 Edge / Bi-Stable (Push Button) / Edge-Toggle mode

Manual switch S1 and S2 can set to Edge mode or Pulse mode or Edge-Toggle mode, default value is Edge mode.

#### 3-1-1 Edge mode:



This mode is suitable for the bi stable wall switch that has indicator on the switch in which the same position corresponds to same state of relay 1.

If the BCL1 relay changes state because of receiving a Z-Wave RF command, the switch position may need to be altered two times (switch on to off or switch off to on) to bring the relay back to its corresponding state.

**Note: Manual switch S2 is disabled in this mode.**

#### 3-1-2 Bi-Stable (Push Button) mode



This mode is suitable for the toggle type wall switch to swap the state of Relay 1.

**3-1-3 Edge-Toggle mode:** this mode is suitable for the normal bi-stable switch, every time when the state of the wall switch changes this will also swap the state of Relay 1. Use this mode if using S2 switch.

### 3-2 Restore Switch State Mode

Whenever the AC power reconnected to module, it will set the switch to Off、 On or Last switch state, default value is Last switch state.

#### 3-3 Manual On/Off Mode

The On/Off function of S1,S2 and learn switch can be disabled or enabled by this parameter, default value is Enable. The learning operation won't be affected when the manual On/Off function is disabled, the RF command can only switch On but not Off. This is useful function for keeping the module in switch on state.

#### 3-4 LED indication Mode

**3-4-1 Show switch state :** LED on for switch on and off for switch off. The default value is Show switch state.

**3-4-2 Show night mode :** LED off for switch on and on for switch off.

**3-4-3 One Flash mode :** When the state of switch changes, LED will be on only one second, then LED stays off.

#### 3-5 Auto Off timer

When auto off timer is equal to 0, the auto off function will be disabled. Whenever the switch is set to on, the auto off timer begin to count down. After the timer counts to zero the module will switch off automatically. The default value is disable auto off function.

#### 3-6 RF Off command mode

Whenever a RF Off command is received, BASIC\_SET、 BINARY\_SWITCH\_SET SWITCH\_ALL\_OFF, it could be interpreted as Switch Off、 Switch On、 Switch Toggle, or it would be ignored. The default value is Switch Off.

#### 4. Protection Command Classes

The module supports Protection Command Class version 2, it can protect the switch against unintentional control by e.g. a child. And it can also protect the switch from being turned off by setting it in “No RF Control” state.

After being set to the “Protection by sequence” state, any intentional pressing of the Include button or S1/S2 should be hold longer than 1 second, or the switch state will not change. However, the operation of learn function does not change, because learning will not be protected.

#### 5. Command Classes

The Switch supports Command Classes including...

- \* COMMAND\_CLASS\_ZWAVEPLUS\_INFO\_V2
- \* COMMAND\_CLASS\_VERSION\_V2
- \* COMMAND\_CLASS\_MANUFACTURER\_SPECIFIC\_V2
- \* COMMAND\_CLASS\_SECURITY
- \* COMMAND\_CLASS\_MODULE\_RESET\_LOCALLY
- \* COMMAND\_CLASS\_ASSOCIATION\_V2
- \* COMMAND\_CLASS\_ASSOCIATION\_GRP\_INFO
- \* COMMAND\_CLASS\_POWERLEVEL
- \* COMMAND\_CLASS\_SWITCH\_BINARY
- \* COMMAND\_CLASS\_BASIC
- \* COMMAND\_CLASS\_SWITCH\_ALL
- \* COMMAND\_CLASS\_CONFIGURATION
- \* COMMAND\_CLASS\_ALARM
- \* COMMAND\_CLASS\_PROTECTION\_V2
- \* COMMAND\_CLASS\_FIRMWARE\_UPDATE\_MD\_V2

#### 7. Technical Specifications

Technical Specifications	
Operating Voltage	100-240VAC 50/60Hz
Maximum Load	11A (230VAC/120VAC) Resistive Load
Range	40M indoor, 100M outdoor line of sight
Operating Temperature	0C - 40C
Dimensions	47.5*39.2*16.0mm
Package Dimensions	142*67*25mm
Weight	55.5g inc. packaging
Installation	Behind switch in cavity or 60mm Box
Switching	Relay
*Specifications are subject to change due to improvement without notice	

This device can be included and operated in any Z-Wave network with other Z-Wave certified modules from any other manufacturers. All constantly powered nodes in the same network will act as repeaters regardless of the vendor in order to increase reliability of the network.

#### Important disclaimer.

Z-Wave wireless communication is inherently not always 100% reliable, and as such, this product should not be used in situations in which life and/or valuables are solely dependent on its function.

## Trouble Shooting.

Symptom	Cause of failure	Recommendation
The Device is not working and LED is Off	1. The device is not connected to the Main Power supply. 2.The device is faulty.	1. Check power connections  2. Don't open the device. Contact us for instructions.
The Device LED is illuminating but cannot control the ON/OFF function.	Check to see if the Load is correctly connected and doesn't have an independent ON/OFF Switch	Set the ON/OFF switch of the Load to ON.
The Device LED is illuminating but a sensor cannot control the device	1. Association not carried out. 2. Possible frequency interference.	1. Perform Association 2. Wait for a while, then retry.
LED Keeps Flashing continually and cannot control	Overload Condition	Remove the Load and check max. Load. Do Not Exceed 85C 230VAC/120VAC Resistive Load.




FCC ID : RHPAN05

### Warning:

1. Plug out to disconnect from power supply; do not plug in line.
2. Do not exceed the max rating

## Disposal

	<p>This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.</p>
---	---

Manufactured for Black Cat Control Systems  
26 Tiller Lane, Patterson Lakes 3197 Australia by:  
Philio Technology Corporation.  
8F.,No.653-2,Zhongzheng Rd., Xinzhuang Dist., New  
Taipei City 24257,Taiwan(R.O.C)

### FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital module, 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.



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

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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



[www.blackcatcontrolsystems.com.au](http://www.blackcatcontrolsystems.com.au)

Date: 25/05/2016

Document: Black Cat Lite 1 User Manual

Version 1.02