BE NEXT

Quick start
MoLiTe sensor EU

Movement sensor

Technical specs

Normal operating voltage	2x AA 1,5V batteries
Frequency range	868.42 MHz
Wireless Range	Up to 30 meters in line of sight
Temperature sensor accuracy	+/- 2,5° C from -55° C to +130° C
Motion sensor range	Max. 10 meters under a 110° angle

Light and temperature sensor

Indicator light

Basic Operations

- The *MoLiTe* can detect movement,
- The *MoLiTe* can measure light intensity
- The *MoLiTe* can measure the temperature.
- The *MoLiTe* can trigger a security system.

How it operates

After a successful inclusion the *MoLiTe* can be mounted on the wall directly or with a bracket.
When movement is detected the indicator light will blink shortly, this indicates that a z-wave message has been send successfully.
With a controller you can request the temperature and battery level.

Mounting

1. Before mount, the *MoLiTe Sensor* should be included into a Z-Wave network and associated.
2. Use a flat screwdriver at the inlets on the sides to gently unlock the back cover.
3. Use the supplied screws to mount the cover or bracket to the wall.
   For optimal use, mount the *MoLiTe* between 1,5m and 2,5m above ground
   (A rotating bracket is available to adjust the direction the *MoLiTe* is pointing to).
4. Place two AA 1,5V batteries into the device.
5. Mount the *MoLiTe* onto the back cover and be sure to close it on all sides.
6. Mounting is completed when the led blinks for a full 1 sec.
7. The MoLiTe sensor has to start up for ca 10 seconds.
8. After ca 10 seconds the MoLiTe is ready for detection.
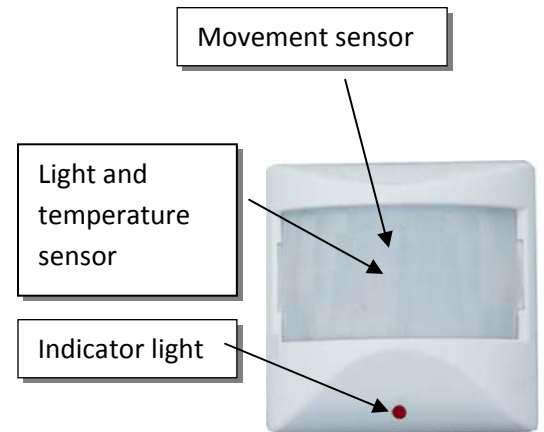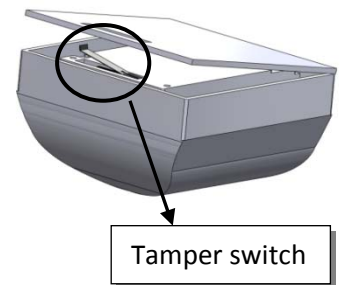
Tamper switch

Include or exclude in Z-Wave network [1]

1. When the *MoLiTe* is mounted, remove it from the back cover.
2. Press and hold the *Tamper switch* for 2 seconds and release to start the inclusion or exclude process.
3. When classic inclusion failed, the product will start Network Wide Inclusion automatically.

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[1] Make sure your Z-Wave controller is in de correct operation mode (include or exclude).

![BENEXT logo]

Technical Manual

Caution:

- **This device is using a radio signal that passes through walls, windows and doors. The range is strongly influenced by local conditions such as large metal objects, house wiring, concrete, furniture, refrigerators, microwaves and similar items. On average, the indoor range is approximately 30 meters.**
- **Do not expose this product to excessive heat or moisture.**
- **Prevent long term exposure to direct sunlight.**
- **Do not attempt to repair this product. If the product is damaged or if you are in doubt about the proper operation, take the product back to the place of purchase.**
- **Do not clean the product with any liquid.**
- **Indoor use only.**
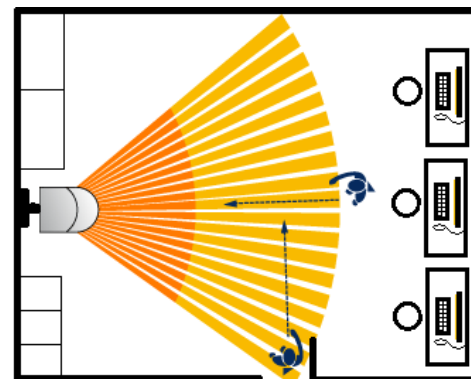
Technical details

Normal operating voltage	2x AA 1,5V batteries From 2,3 to 4,0V do not use rechargeable batteries
Frequency range	868.42 MHz
Wireless Range	Up to 30 meters in line of sight
Temperature sensor accuracy	+/- 2,5° C from -55° C to +130° C
Motion sensor range	Max. 10 meters under a 110° angle
Storage temperature	-5°C to +65°C
Storage humidity	10% to 70%
Operating temperature	0°C to 50°C
Operating humidity:	30% to 80%

Detailed instruction

We advise the *MoLiTe* to be mounted between 1,5m and 2,5m from the ground, flat on the wall and not facing down. With an optional bracket, the direction the *MoLiTe* is points at can be changed (up/down and left/right). The *MoLiTe* detects movement up to 10 meters. Without bracket attached, it is recommended to place to *MoLiTe* in the middle of the wall (see 'Good sensor positioning').

1,8 METER
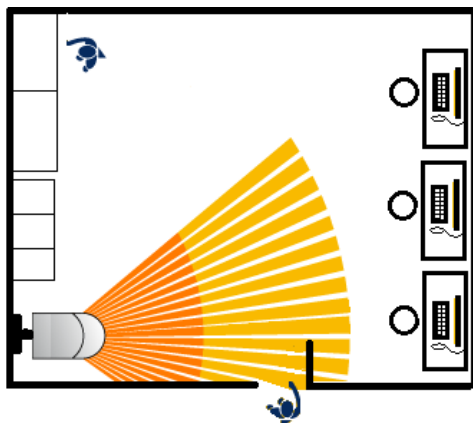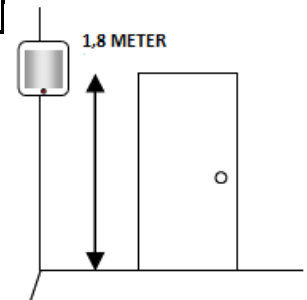
Bad sensor positioning (poor area coverage)   **Good sensor positioning**

Indication mode

The indicator light gives various statuses of the device as follows:

1. Ready for learn mode: indicator light blinks every second.
2. Learn in progress (add):   indicator light 2 times every second.
3. Learn in progress (remove):   indicator light 3 times every second.
4. Learn mode success: indicator light is on for one second.
5. Learn mode failed: indicator light blinks 8 times rapidly.
6. Tamper pressed/released   indicator light blinks 3 times rapidly.
7. Mounting successful   indicator light is on for 1 second.
8. RF message send failed   indicator light blinks 6 times rapidly

Supporting Command Classes

Basic type: BASIC_TYPE_ROUTING_SLAVE

Generic type: GENERIC_TYPE_SENSOR_BINARY

Specific type: SPECIFIC_TYPE_NOT_USED

Listening: False, Z-Wave Lib: 4.51

class: 0x30 COMMAND_CLASS_SENSOR_BINARY

class: 0x31 COMMAND_CLASS_SENSOR_MULTILEVEL

class: 0x60 COMMAND_CLASS_MULTI_CHANNEL_V2

class: 0x70 COMMAND_CLASS_CONFIGURATION

class: 0x71 COMMAND_CLASS_ALARM

class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC

class: 0x80 COMMAND_CLASS_BATTERY

class: 0x84 COMMAND_CLASS_WAKE_UP

class: 0x85 COMMAND_CLASS_ASSOCIATION

class: 0x86 COMMAND_CLASS_VERSION

class: 0xEF COMMAND_CLASS_MARK

class: 0x20 COMMAND_CLASS_BASIC

Not listening Routing SLAVE

This Z-Wave product will be used as routing slave. Slave nodes are nodes in a Z-Wave network that receive commands and perform actions based on the command. This device will always be in sleep mode because it works on batteries. In sleep mode the device is not active listening, the device will wake up according to the wakeup command class.

Include Initiator

The include initiator is used when Primary and Inclusion Controllers include nodes into the network. When both the include initiator have been activated simultaneously the new node will be included to the network (if the node was not included previously).

Exclude Initiator

The exclude initiator is used by Primary Controllers to exclude nodes from the network. When the exclude initiator and a slave initiator are activated simultaneously, it will result in the slave being excluded from the

network (and reset to Node ID zero). Even if the slave was not part of the network it will still be reset by this action.

Z-Wave compatibility
Because this is a Z-Wave device, it means it can co-operate with other Z-Wave devices of other manufacturers. It can co-exist in a Z-Wave network existing with product from other manufacturers.

Hops & Retries
The Z-Wave range has a range of up to 30 meters in line of sight. This signal is not limited to the 30 meter range due to routing the Z-Wave message to other nodes in the network. This way the range of the Z-Wave network can be expanded to 150 meters indoors (limit of 4 hops).

class 0x20 COMMAND_CLASS_BASIC
When a movement is detected a basic set frame with value 255 is sent to the associated nodes. If the configured time is done with no movement is detected a basic set frame with value 0 is sent to the associated nodes. This is the controlling role of the basic command class.

The supporting role of the basic command class is mapped to the sensor binary command class.

class: 0x30 COMMAND_CLASS_SENSOR_BINARY
The Sensor Binary Command Class can be used to check if motion is detected, value 0 means that there is no motion detected and therefore a associated node is off, value 255 means that a associated node is on.

Class: 0x80 COMMAND_CLASS_BATTERY
This class is used to request and report battery levels for a given device.
When battery level is lower then 20% the MoLiTe will send a battery warning (value 255) after every wake up notification. A battery get will report the actual value even if below 20 %

class: 0x86 COMMAND_CLASS_VERSION
This Command Class is used to obtain information about the *MoLiTe*. The Z-Wave library type, the Z-Wave protocol version and the application version will be reported.

Because the version 2 is supported this command class can also be used to request the serial number of the device with the DEVICE_SPECIFIC_GET command.

class: 0x72 COMMAND_CLASS_MANUFACTURER_SPECIFIC
This will report information about the manufacturer. This product will contain the manufacturer ID of *BeNeXt*.

Manufacturer ID of *BeNeXt* is 138, the ID of this product is 4.

class: 0x70 COMMAND_CLASS_CONFIGURATION
Configure parameters:

0. **Not used**
1. **Set to default**
   Description: Set all config values to default values (factory settings). Read more in
                            chapter configuration Reset.
   Size: 1 byte*
   Param1:   if 0xFF then set to default
   Param2,3,4:   not used

2. **Mode timeout**

Description:	The time used in mode 2 to turn the sensor off. This Time will start running as soon as detection is seen.
Default value:	0x0384 = 900 sec = 15 min
Size:	2 bytes (integer)*
Param1:	the most significant byte of the integer
Param2:	the least significant byte of the integer
Param3,4:	not used

3. **Switch off time**

Description:	The switch off time will start running as soon as mode timeout is done. Motion sensor is turned on and when movement is detected again the mode timeout (cfg param 1) will start running all over again. When switch off time is done a basic off message is sent to the associated node.
Default value:	0x0A8C = 2700 sec = 45 min.
Size:	2 bytes (integer)*
Param1:	the most significant byte of the integer
Param2:	the least significant byte of the integer
Param3,4:	not used

4. **Sensitivity**

Description:	the sensitivity of the motion circuit
Default:	0x50 = 80
Size:	1 byte*
Param1:	Sensitivity value between 0 and 127 (values above 127 will be reported as the set value but will be handled in SW as 127). 0 is least sensitive and 127 is most sensitive.
Param2,3,4:	not used

5. **the mode**

Description:	The mode that is entered after detection
Default:	0x02
Size:	1 byte*
Param1:	mode 1, 2 or 3. Mode 1: no detection possible. Battery save mode Mode 2: normal operation mode: send on after detection and off after given time no detection. Mode 3: Z-Wave chip is always on to request e.g. version or manufacturer id. If mode is 0 or higher then 3, that value will be reported after a get but will be handled in SW as mode 2.
Param2,3:	not used.

6. **The temperature offset**

Description:	A offset for the temperature.

Default: 0x00

Size: 2 bytes*
Param1,2:   A signed integer to determine the offset off the temperature.
Param3,4:   not used.

* if a size is other then given size the frame is ignored totally so configuration values are **not** changed

class: 0x31 COMMAND_CLASS_SENSOR_MULTILEVEL

Sensor_multilevel_get

The Sensor Multilevel Command Class is used to get a report from the MoLiTe. The returned value is the measured temperatue inside the housing with 2 decimals.

class: 0x60 COMMAND_CLASS_MULTI_CHANNEL_V2

Request temperature

Channel 1

Note: The returned value is the measured temperature (+/- offset) inside the housing with 2 decimals.

Request light / lux

Channel 2

Note: The returned value is the measured LDR resistance in %.

class: 0x85 COMMAND_CLASS_ASSOCIATION

The Association Command Class is used to associate other devices with the *MoLiTe*. The devices that are associated can be controlled on application level. Every node associated in the group will be switched on with a BASIC_SET very time motion is detected.

Number of groupings: 1
Maximum supported nodes per group: 5

Because only one group is supported grouping identifier is ignored in all cases.

class: 0x84 COMMAND_CLASS_WAKE_UP

The Wake Up Command Class is used at battery-operated devices. This class allows the *MoLiTe* to wake up occasionally to notify others devices, that the *MoLiTe* is ready to receive commands. After receiving the commands the *MoLiTe* will go into sleep mode again. The wake up interval can be set using the WAKE_UP_INTERVAL_SET command.

The default value is 0x1C20 = 7200 sec = 2 hour
The default node is 0xFF = 255 (broadcast)

It is possible to send a **wake up notification** on user interaction. To do this press and hold the tamper switch for 4 seconds (mount the device).

When the wake up time is set to 0 a **wake up notification** is never send periodically, only on user interaction.

class: 0x71 COMMAND_CLASS_ALARM

This command class is used to identify the state of the tamper alarm. The device will send an unsolicited report to the controller if the status is changed, the value 0x00 will indicate that the tamper is placed correctly on the wall. The value 0xFF will indicate a tamper alarm.

There is 1 alarm type:

3: Tamper switch

Every other alarm type that is requested will be ignored by application.

Configuration Reset

The MoLiTe Supports a configuration reset function. Configuration reset means
- All configuration values are defaulted.
- Wake up interval is defaulted.

Note: All configurations will also be defaulted after exclusion the device.

This function can be activated by sending a configuration set frame:

CONFIGURATION_SET
Parameter: 0x01
Size: 0x01 (can't be different from 1)
Value: 0xFF (can be any value except for 0x55 or 0xAA)

When the value of configuration value is requested 2 possible values can be returned

CONFIGURATION_REPORT
Parameter: 0x01
Value 0x55:   Device doesn't have all his default configuration settings anymore.
                Even when a configuration parameter is changed back to the default value
Value 0xAA: Devices still has all his factory settings.
                This are only configuration parameters, wake up interval can be changed.

Always awake mode

The always awake mode is used to request different values from the device e.g. version and manufacturer specific.

The always awake mode can be activated by:

CONFIGURATION_SET
Parameter: 0x05
Size: 0x01 (can't be different from 1)
Value: 0x03 (mode 3)

The always awake mode can be deactivated by:

CONFIGURATION_SET
Parameter: 0x05
Size: 0x01 (can't be different from 1)
Value: Any value except 3

A second option to deactivate mode 3 is
1. Remove batteries.
2. Wait ca 10 seconds.
3. Replace batteries

Note: in always awake mode the batteries will be drain very fast, we do not recommend to use this mode.

Frequently Asked Questions

Q: I can't have my *MoLiTe* included into my Z-Wave network, what am I doing wrong?
A: **1**. Is the controller ready to include any device into the Z-Wave network? If the controller is not in Include or exclude mode, the *MoLiTe* can not be included or excluded.
     2. The *MoLiTe* is already included in a Z-Wave network. Exclude the *MoLiTe* and Try to include it again.

Q: Why doesn't the *MoLiTe* detect any movement?
A: **1**. The *MoLiTe* isn't included in a Z-Wave network. Include it and try it again.
     2. The batteries are almost empty, try putting new ones in.

Q: The temperature report of the *MoLiTe* is incorrect.
A: **1**. The *MoLiTe* is placed directly in the sun, which makes the temperature in the housing of the *MoLiTe* hotter than elsewhere in the room.
     2. The calibration is not the same as your other temperature sensor, it is possible to do a re-calibration of the temperature sensor with 2myhome and the myGate.

Q: I have configured a value but when I request it, it is not changed?
A: It is mandatory that the correct size is used while configure a parameter; go to the documentation about the configuration command class to check if the right size is used during configuration. If the wrong size is used the frame is ignored totally.

Q: I have configured a new value and when I request it the correct value is returned but the behavior is still the same?
A: Some configuration parameters have limits of what they can do, go to the documentation about configuration to check if the value of the configured parameter is out off limit.

Q: When I mount the MoLiTe it performs its standard mounting routine but after 4 seconds the indicator light doesn't go on for 1 second but blinks 6 times.
A: blinking 6 times can mean:
  1.   MoLiTe is not included
  2.   MoLiTe is not associated
  3.   MoLiTe can't reached his destination
If all three options are corrected, MoLiTe is will operate correctly and can be mounted again.

Q: When I exclude the MoLiTe the configuration times(idle and switch off) are reset back to default.
A: That is correct when the MoLiTe is excluded all configurations including wake up timings are reset back to default. You will need to configure the device again after included into the controller.
By forcing the tamper switch a wake up message (broadcast) will be send to easily change the configuration.