

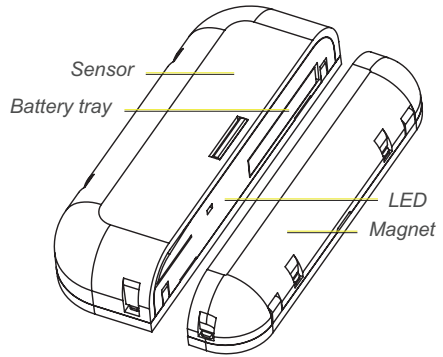
Echoflex Installation Guide

Magnetic Contact Sensor

MC-31

Overview

The Magnetic Contact Sensor (MC-31) is a battery-operated contact sensor that monitors the status of an interior window or door and provides a reliable and simple method to detect occupancy at entry points. The MC-31 can be configured to monitor closed-to-open, and/or open-to-closed transitions, or the current state of the device.



The MC-31 is well suited for occupancy-based hospitality applications that require control to power a room or setback temperature control devices.

The MC-31 incorporates features that assist the installer to position it properly without the need for signal strength indicators and configuration tools.

This document covers installation, testing, and setup of all MC-31 models. The product package includes the contact tray sensor, magnet, and battery.

Prepare for Installation

To ensure optimal function, consider the installation environment and the following guidelines:

- For indoor use only. Operating temperature -25°C to 60°C (-13°F to 140°F), 5%–92% relative humidity (non-condensing).
- High-density construction materials and large metal appliances or fixtures in the space may disrupt wireless transmissions.
- One CR2032 coin cell battery is provided with the MC-31. Install the battery or activate it if factory-installed by removing the protective plastic tab in the battery housing. See [Battery Power on page 4](#).
- Avoid mounting transmitters and receivers on the same wall.



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8188M2101 Rev C Released 2024-09

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Supplies required to install (not provided):

- Four #6 screws, double-sided tape, or Velcro®
- A small magnet for entry door applications

Installation

The MC-31 sensor has two parts: the contact sensor and the magnet. The sensor should be installed on the casing and the magnet on the moving window or door. The location of the MC-31 directly affects the quality of the controller's message reception.

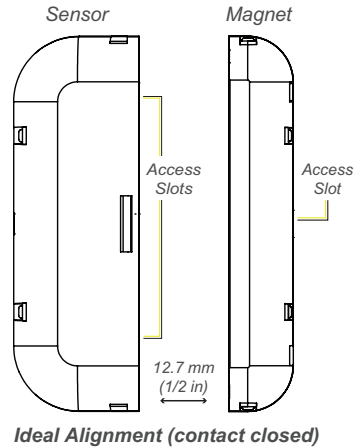
If installing on a beveled window or door trim, ensure the magnet is oriented to accommodate the angle. See [Magnet Position Test on page 6](#) to confirm the location.

Use hand tools for the installation. Over-torquing with a power tool can damage the device.

Mount the Sensor

The sensor can be mounted using screws through the mounting plate, with double-sided tape, or with Velcro.

1. Insert a precision flatblade screwdriver into one of the two access slots on the side and gently pry to remove the sensor from the mounting plate.
2. Mount the mounting plate using two #6 screws.
3. Snap the sensor back into place.



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Mount the Magnet

Orienting the magnet in relation to the sensor is critical. Mount the magnet using screws through the mounting plate, with double-sided tape, or with Velcro.



Note: *If installing the MC-31 for an entry door application, link the sensor to a controller before installing the magnet. See [Link to a Controller below](#).*

1. Insert a precision flatblade screwdriver into the single access slot on the side and gently pry to remove the magnet from the mounting plate.
2. Mount the mounting plate using two #6 screws. To confirm the location relative to the sensor, see [Magnet Position Test on page 6](#).
3. Perform a thorough check to ensure normal use of the window or door does not damage the device.
4. Snap the magnet back in place.

The gap between the sensor and magnet should not exceed 12.7 mm (1/2 in) to prevent damage when opening and closing the door. The ideal planar alignment of the magnet is level with the sensor.

Contact Operation

The MC-31 can be configured to transmit a message when the contact opens, closes, or both (default). See [Operating Mode on page 8](#). The current contact status can also be transmitted as a heartbeat message. See [Heartbeat Messaging on page 9](#) to select the interval.

Link to a Controller

The compatible target controller must be installed, powered, and within range of the MC-31.



Note: *The linking process can be used both to link a device to a controller and to unlink a linked device from a controller.*

1. Press the **[Learn]** button on the controller to activate Link mode. If necessary, refer to controller product documentation.
2. Press the lever-type **[Teach]** button on the sensor once to send a link message. An LED blinks to confirm successful transmission.
3. Deactivate Link mode on the controller before attempting to link to any other controllers.

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Note: For an entry door application, link the sensor in the closed position before mounting the magnet or use a separate small magnet to simulate a closed position. For a window sensor application, link the sensor in the open position.

Battery Power

A CR2032 battery is included with the MC-31. The battery may be factory installed or packed separately according to shipping regulations. Insert the battery if required or remove the protective plastic tab before installing the MC-31.



Note: When the battery is low, a single red LED blinks every 15 seconds or double-blinks if critically low. Replace battery immediately to ensure messages are transmitted.

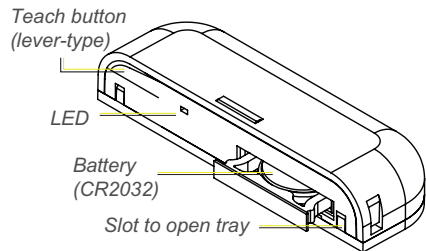
The battery can be replaced while the sensor is in its mounted position.

To replace the battery:

1. Insert a precision flatblade screwdriver into the slot and gently pry to open the tray.
2. Insert the new battery in the tray with the positive side (+) up.
3. Close the battery tray and press the lever-type **[Teach]** button to test.

The blue LED blinks to confirm success.

Estimated battery life is up to 10 years based on an average of 10 operations per day. Configuration settings that require many transmissions affect the life of the battery.



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Tests and Settings

Use the lever-type **[Teach]** button and color LEDs to navigate the Tests and Settings menu. The **[Teach]** button and LED display are on the flat side of sensor.

- *Exit and Start Over* (green LED single blink)
- *Range Confirmation* (blue LED single blink)
- *Magnet Position Test* (red LED single blink)
- *LED Display* (green LED double-blink)
- *EEP Select* (blue LED double-blink)
- *Operating Mode* (red LED double-blink)
- *Heartbeat Messaging* (green LED triple-blink)
- *Energy Status Messaging* (blue LED triple-blink)
- *Redundant Messaging* (red LED triple-blink)
- *Restore Defaults* (blue, then red, then blue LED triple-blink)

Blink intervals make it easy to distinguish between single, double, and triple-blinks. The menu times out after two minutes of inactivity.



Note: *A simultaneous blink combination of green, blue, and red LEDs creates a white LED. The white LED blinks twice to confirm a selection.*

Exit and Start Over

It may be convenient to enter the menu once to run tests and configure settings. However, if you want to exit the menu without waiting for it to time out you can use the first menu item.

- When the green LED blinks once, press and hold the **[Teach]** button until the white LED blinks twice. The MC-31 then flashes all the LEDs and exits the menu.

Range Confirmation

The Range Confirmation test quantifies the wireless signal strength with a linked controller that has range confirmation capability.



Note: *The MC-31 should be linked to one controller only to run the test properly. Disable repeaters in range.*

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the blue LED blinks once.
3. Press and hold the **[Teach]** button until the white LED blinks twice to initiate the Range Confirmation Test.

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After the MC-31 transmits and receives a Range Confirmation message, the signal strength status is then displayed (see table below).

LED Blinks	Signal Strength
1 white followed by 5 green	-41 to -70 dBm (best)
1 white followed by 5 blue	-70 to -80 dBm (good)
1 white followed by 5 red	-80 to -95 dBm (poor, move closer)
1 white	No linked controllers detected

The test runs for 50 seconds. To exit before time-out, press and hold the **[Teach]** button until the white LED blinks twice.

Magnet Position Test

The Magnet Position Test uses a red blinking LED to indicate whether the magnet is properly positioned to be detected by the sensor. The LED indication for this test operates even if the [LED Display on the facing page](#) setting is disabled.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the red LED blinks once.
3. Press and hold the **[Teach]** button until the white LED blinks twice to initiate the Magnet Position Test.
 - Rapid red LED blinks indicate the magnet is in range
 - No LED if out of range

To exit before time-out, press and hold the **[Teach]** button until the white LED blinks twice.

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LED Display

During normal operation, a green LED blinks to indicate a contact open event and a red LED blinks to indicate a contact close event. The LED Display setting controls whether the operating mode LEDs are enabled or disabled.

Disabling the LEDs eliminates distractions as well as conserves battery power. The LEDs still operate to run tests and indicate low battery even if the display is disabled.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the green LED double-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select LED Display. The green LED blink code displays the current setting. Press and release the **[Teach]** button to navigate the options.

LED Blinks	Setting
1 green blink	Disabled: no LED blink
2 green blinks	Enabled: LED blink on contact (default)

4. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

EEP Select

The default EEP setting is configured to work with Echoflex controllers. The MC-31 can be configured to be compatible with controllers that use an alternate profile.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the blue LED double-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select EEP Select. The blue LED blink code displays the current setting.
4. Press and release the **[Teach]** button to navigate the options.

LED Blinks	Setting
1 blue blink	A5-30-02 (default)
2 blue blinks	D5-00-01

5. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

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Operating Mode

The Operating Mode determines what type of event will trigger the MC-31 to send a message. Minimizing transmissions conserves battery power, which may be a consideration in high-activity installations.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the red LED double-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select Operating Mode. The red LED blink code displays the current setting. Press and release the **[Teach]** button to navigate the options.

LED Blinks	Setting	Behavior
1 red blink	Every open or close event (default)	Sends <i>Contact Open</i> message when the contact goes from closed to open, sends <i>Contact Closed</i> message when contact goes from open to closed
2 red blinks	Open events only	Sends <i>Contact Open</i> messages
3 red blinks	Close events only	Sends <i>Contact Closed</i> messages

4. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

The Operating Mode does not affect transmission of the configured heart-beat message. The two transmission settings are independent.

To exit before time-out, press and hold the **[Teach]** button until the white LED blinks twice.

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Heartbeat Messaging

A heartbeat message indicates the current contact status, regardless of the Operating Mode setting. Heartbeat Messaging can be set to control the frequency that a heartbeat message is sent.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the green LED triple-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select Heartbeat Messaging. The green LED blink code displays the current setting. Press and release the **[Teach]** button to navigate the options.

LED Blinks	Setting
1 green blink	Disabled: No heartbeat
2 green blinks	Every 54 minutes
3 green blinks	Every 27 minutes (default)
4 green blinks	Every 18 minutes
5 green blinks	Every 13.5 minutes

4. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

To exit before time-out, press and hold the **[Teach]** button until the white LED blinks twice.

Energy Status Messaging

Energy Status Messaging can be enabled to provide a battery status message. For installation locations that are difficult to monitor, checking the status of the battery frequently may be a requirement. See [Battery Power on page 4](#).

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the blue LED triple-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select Energy Status Messaging. The blue LED blink code displays the current setting. Press and release the **[Teach]** button to navigate the options.

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LED Blinks	Setting
1 blue blink	Disabled: No messages (default)
2 blue blinks	Status message every hour
3 blue blinks	Status message every 2 hours
4 blue blinks	Status message every 4 hours
5 blue blinks	Status message every 8 hours

4. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

Redundant Messaging

Redundant Messaging can be enabled to provide a backup to the original contact state message. For installation locations not ideal for wireless communications and where hardwired devices are not an option, enabling redundant transmissions may improve reliability.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when the red LED triple-blinks.
3. Press and hold the **[Teach]** button until the white LED blinks twice to select Redundant Messaging. The red LED blink code displays the current setting. Press and release the **[Teach]** button to navigate the options.

LED Blinks	Setting
1 red blink	Disable (default)
2 red blinks	Enable

4. Press and hold the **[Teach]** button until the white LED blinks twice when the target indication displays. The MC-31 saves the setting and then restarts.

Restore Defaults

Make sure you want to restore all the factory defaults for the MC-31. You cannot undo this command.

1. Press and hold the **[Teach]** button until the white LED blinks twice.
2. Press and release the **[Teach]** button to cycle through the menu of color LEDs and stop when blue, red, blue LEDs triple-blink.
3. Press and hold the **[Teach]** button until the white LED blinks twice to restore defaults and restart.
4. Press and hold the **[Teach]** button until the white LED blinks twice to select EEPROM Select.

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Compliance

For complete regulatory compliance information, see the Magnetic Contact Sensor datasheet at echoflexsolutions.com.

FCC Compliance

Echoflex Magnetic Contact Sensor

(For any FCC matters):

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echoflexsolutions.com

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.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Any modifications or changes to this product not expressly approved by Electronic Theatre Controls, Inc. could void the user's authority to operate the product. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

Contains FCC ID: SZV-STM300U

ISED Compliance

This device contains a license-exempt transmitter/receiver that complies with Innovation, Science, and Economic Development Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Contains IC ID: 5713A-STM300U

Conformité ISDE

Cet appareil contient un émetteur/récepteur conforme aux CNR d'Innovation, Sciences et Développement économique Canada (ISDE) applicables aux appareils radio exempt de licence. Son fonctionnement est soumis aux deux conditions suivantes:

1. L'appareil ne doit pas produire d'interférences.
2. L'utilisateur de l'appareil doit accepter toute interférence, même si l'interférence est susceptible d'en compromettre le fonctionnement.

Contient ID IC: 5713A-STM300U

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