C-Max RF™

EasyRF™ LIGHTING CONTROLS

COMMISSIONING GUIDE
Wireless Lighting Control System

C-Max™
LIGHTING CONTROLS

MaxLite®
A NEW WAVE OF LIGHT

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Overview

EasyRF™ is a room-based wireless lighting control system designed for effortless integration of luminaire-level lighting controls (LLLC) in both new construction and retrofit projects. As part of the versatile and multi-tiered c-Max Lighting controls platform, EasyRF™ simplifies commissioning by enabling groupable wireless controls without the need for a mobile app or gateway. Compliant with energy codes and budget-friendly, EasyRF™ provides an effortless solution for your lighting control needs for any small to medium size projects. EasyRF™ supports long range communication due to its proprietary Sub-GHz RF technology. The system allows for easy zoning capabilities through use of floors and channels making it suitable for multiple-floor layouts. Combining simplicity with powerful functionality, EasyRF™ empowers contractors and facility managers with a straightforward solution of wireless grouping and control.
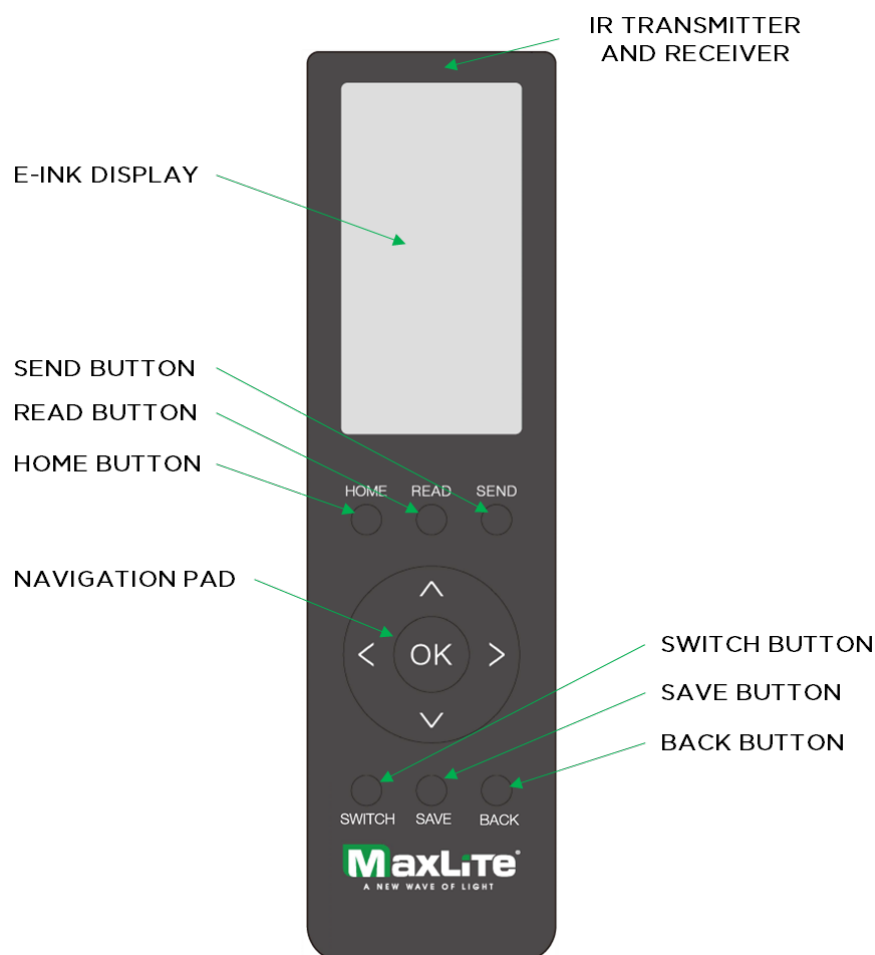
The RF-Remote is a crucial tool for managing c-Max EasyRF™ controls, offering a perfect blend of simplicity, safety, and advanced functionality. Equipped with an E-ink display, RF-Remote is a portable handheld device engineered for modifying default settings, programming and testing EasyRF™ devices. Its design emphasizes user convenience and efficiency by providing wireless access to devices facilitating swift and safe modifications without physical contact.

Thanks to its bi-directional IR communication capabilities, RF-Remote can both send and receive data from up to 50 feet out. Simple menu screens enable users to recall current sensor profiles and make necessary changes, ensuring accurate adjustments that reflect each device's status. The buttons on the remote serve different functions including easy navigation of the main and sub-menus, sending and reading sensor settings and pairing wall switches.

EasyRF™ was designed with scalability in mind, and it offers many advanced level features typically found in a networked system. RF-Remote is used to not only set and fine tune program device parameters but also assign zone hierarchies such as channels and floors. This is particularly useful in multi-floor buildings where multiple devices need to be managed simultaneously without interference.

RF-Remote significantly simplifies the commissioning and management of EasyRF™ system for installers and facilities managers alike with its *Point, Click and Group* functionality.

Navigation

IR TRANSMITTER
AND RECEIVER

E-INK DISPLAY

SEND BUTTON
READ BUTTON
HOME BUTTON

HOME   READ   SEND

NAVIGATION PAD

< OK >

SWITCH BUTTON
SAVE BUTTON
BACK BUTTON

SWITCH   SAVE   BACK

MaxLite
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HOME: To power on the RF-REMOTE, press the **HOME** button. The remote will automatically turn off after 3 minutes of inactivity. Pressing the HOME button brings the main menu on the screen.

READ: To read the sensor settings, point the remote to the sensor and press **READ**.

SEND: To program sensors with a new profile or new settings press **SEND**.

NAVIGATION PAD: Use the navigation pad to scroll between fields by pressing the **UP** or **DOWN** arrow keys. The active field is highlighted with a darker background. To choose an option, press the **OK** button on the navigation pad. To adjust a selected setting, press the **LEFT** or **RIGHT** arrow buttons to toggle between options.

SWITCH: To pair a wall switch to a channel.

SAVE: To save sensor settings to one of the 5 profiles.

BACK: To return to the previous screen.

The firmware version number of RF-REMOTE will be displayed on the MAIN SCREEN.

Batteries

The RF-REMOTE is powered by two (2) AAA alkaline batteries. The **MAIN SCREEN** displays the battery status as a percentage of life remaining. When the batteries are running low, the battery symbol on the remote screen will begin to blink.

The WRF2RB-W wall switch is powered by one (1) CR2430 coin cell battery. When the battery is running low, the LED indicator in the wall switch will turn green.

RF-REMOTE Range

The IR transmitter and receiver allow for up to 50ft of send/receive commands.

Operation

Press the **HOME** button to turn on the remote to display the main menu. Press the up or down buttons to highlight the desired function, then press OK to access the sub-menus. The remote will automatically turn off after 3 minutes of inactivity. Use the **BACK** button to return to the previous screen.

Main Screen

Press the HOME button to turn on the remote. Press the up or down buttons to highlight the desired setting, then press OK.
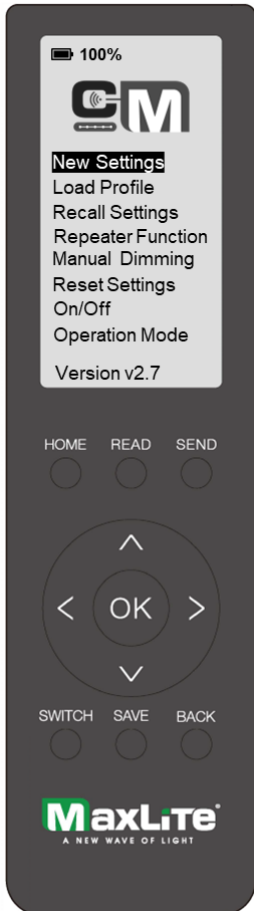
NEW SETTINGS: Enables you to choose various sensor parameters, such as High Mode, Hold Time, Standby Dimming Level, Standby Time, Sensitivity Detection Range, Daylight Threshold, Continuous Adjustment Mode, Ramp Up/Down, and RF Channel.

LOAD PROFILE: Lets you select saved parameter profiles, useful for programming multiple sensors with identical settings.

RECALL SETTINGS: Point the remote at a programmed sensor to read its current settings. You can then save this setting as a new profile.

REPEATER FUNCTION: Lets you select a sensor to relay or repeat a message in the channel to extend the range. Note: assigning too many sensors as repeaters will flood the channel, which will cause false triggers. Repeaters should be used sparingly and only in applications where extended coverage is required due to layout limitations.

MANUAL DIMMING: Allows you to manually control the light intensity from 0-100%.

RESET SETTINGS: Restores the sensor to its factory default.

ON/OFF: Turn an individual light on or off.

OPERATION MODE: Supports programming of sensors embedded with different firmware.

Definitions and Default Settings

FLOOR: Representing an area, a floor logically consists of multiple groups/zones of luminaires. Assign a project as a unique floor with a maximum of 8 floors per location. Floor represents the highest tier of the zoning hierarchy.
Default FLOOR = "A"

CHANNEL: Representing a logical group or zone of lights, it is expected that all lights in the same channel have the same control behavior. Assign up to 50 sensors to a channel for grouping capabilities with a maximum of 50 channels per floor.
Default CHANNEL = "1"

HIGH: High Trim Mode, set maximum threshold high trim value 50-100% increments of 1%
Default HIGH = "100%"

LOW: Low Trim Mode, set minimum dimming threshold low trim value 1-25% increments of 1%
Default LOW = "10%"

AUTO: Auto brightness level, set a partial ON level. The selectable range is limited by the LOW and HIGH trim settings, in increments of 1%
Default AUTO = "100%"

HOLD: Hold Time or 1st time delay time of no occupancy after which fixture goes to standby: 2s / 30s / 1min / 5min / 10min / 15min / 20min/ 30min / 60min / ∞
Default HOLD = "10min"

SDL: Standby dim level, sets the light output during standby after the hold time expires. The selectable range is limited by the LOW and HIGH trim settings, in increments of 1%
Default SDL = "50%"

STAND: Standby time or 2nd time delay, choose a standby time or second time delay to set the duration for SDL to maintain. 0s / 10s / 1min / 5min/ 10min / 30min / 1hr / ∞ (0s means on/off control, and ∞ means the standby time is infinite)
Default STAND = "30min"

SDR: Adjust PIR Sensitivity Detection Range, 10/25/50/75/100%
Default SDR = "100%"

VAC: Vacancy Mode, switching motion detection mode between occupancy (Auto ON/Disable) and vacancy (Manual ON/Enable)
Default VAC = "Disabled"

CAM: Continuous Adjustment Mode (Daylight Harvesting), Measure and set feature to allow lights to maintain a light level between 26-100% or set as disabled (No Daylight Harvesting)
Default CAM = "Disabled"

DAY: Daylight Threshold, set lowest dimming level during Daylight 5-25%, increments of 5% or disabled.
Default DAY = "Disabled"

R-UP: Ramp-up time, fade time to gradually bring lights up to a set value. 0-60 seconds increments of 1 second
Default R-UP = "2s"

R-DOWN: Ramp-down time, fade time to gradually dim lights to a set value. 0-60 seconds increments of 1 second
Default R-DOWN = "2s"

LINK: Linkage, synchronize lights in the same channel Enable/Disable. When enabled, all members are grouped. When disabled, each sensor acts like a stand-alone
Default = "ENABLE

Programming Sensors – New Settings

Enables you to choose various sensor parameters, such as High Mode, Hold Time, Standby Dimming Level, Standby Time, Sensitivity Detection Range, Daylight Threshold, Continuous Adjustment Mode, Ramp Up/Down, and RF Channel.

Fig 1A   Fig 1B   Fig 1C   Fig 1D   Fig 1E
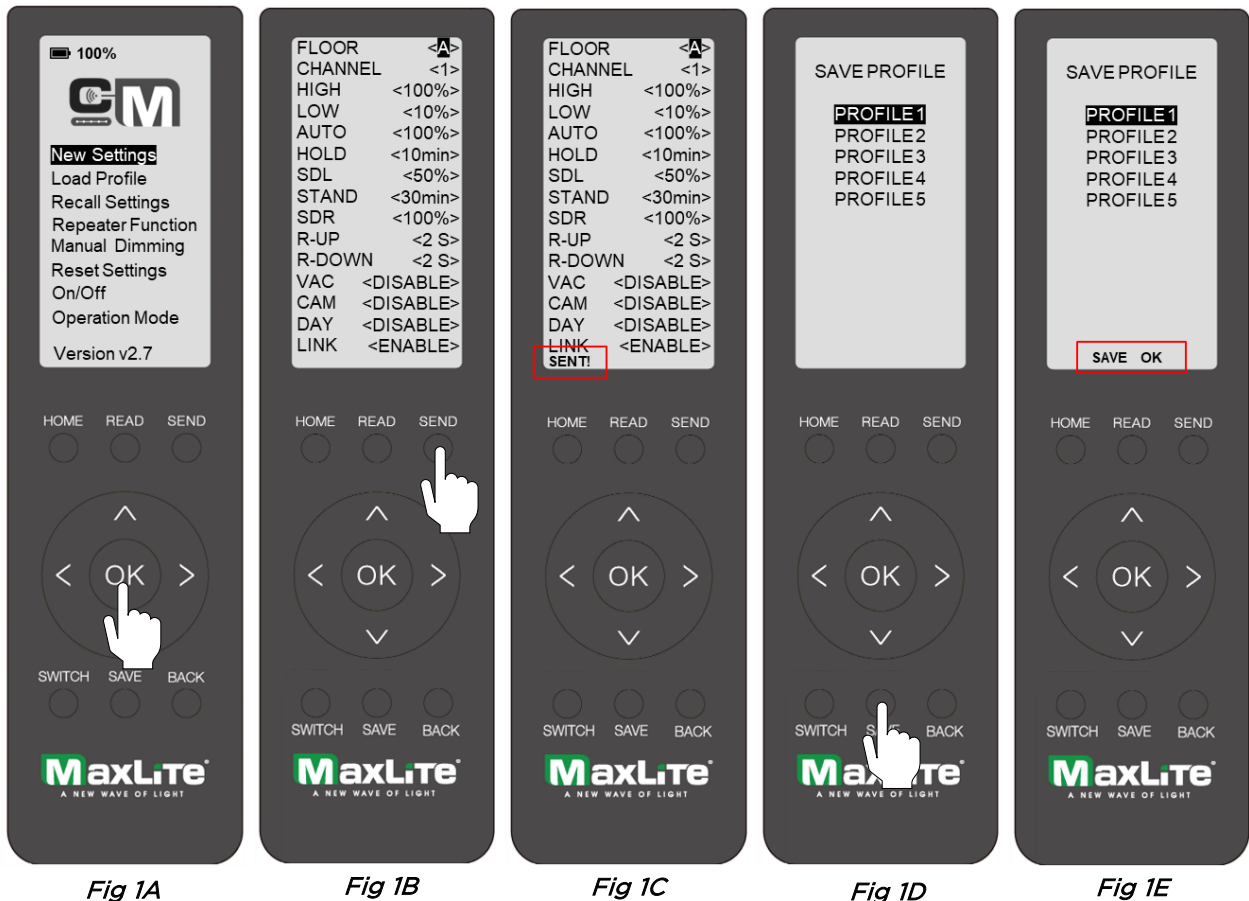
1. Once the **HOME** screen is displayed, navigate to **NEW SETTINGS** and highlight it, then press **OK** to enter **NEW SETTINGS** (Fig 1A).
2. Scroll up and down to highlight each configuration. Use the **LEFT/RIGHT** buttons to adjust the settings. After configuring all parameters, point the remote at the sensor and press **SEND** (Fig 1B). This step can be repeated to program sensors in any channel.
3. If the configuration is successfully sent, a confirmation message will appear at the bottom left of the screen (Fig 1C) and lights will blink.
4. After the configuration settings are sent, you can save it by pressing the **SAVE** button (Fig 1D). The screen will prompt you to select from 5 PROFILES. Choose a profile and press SAVE to save the setting. A confirmation message will appear on the screen saying *SAVE OK* (Fig 1E).

Load Profile

Load profiles will allow you to select saved parameter profiles, useful for programming multiple sensors with identical settings.
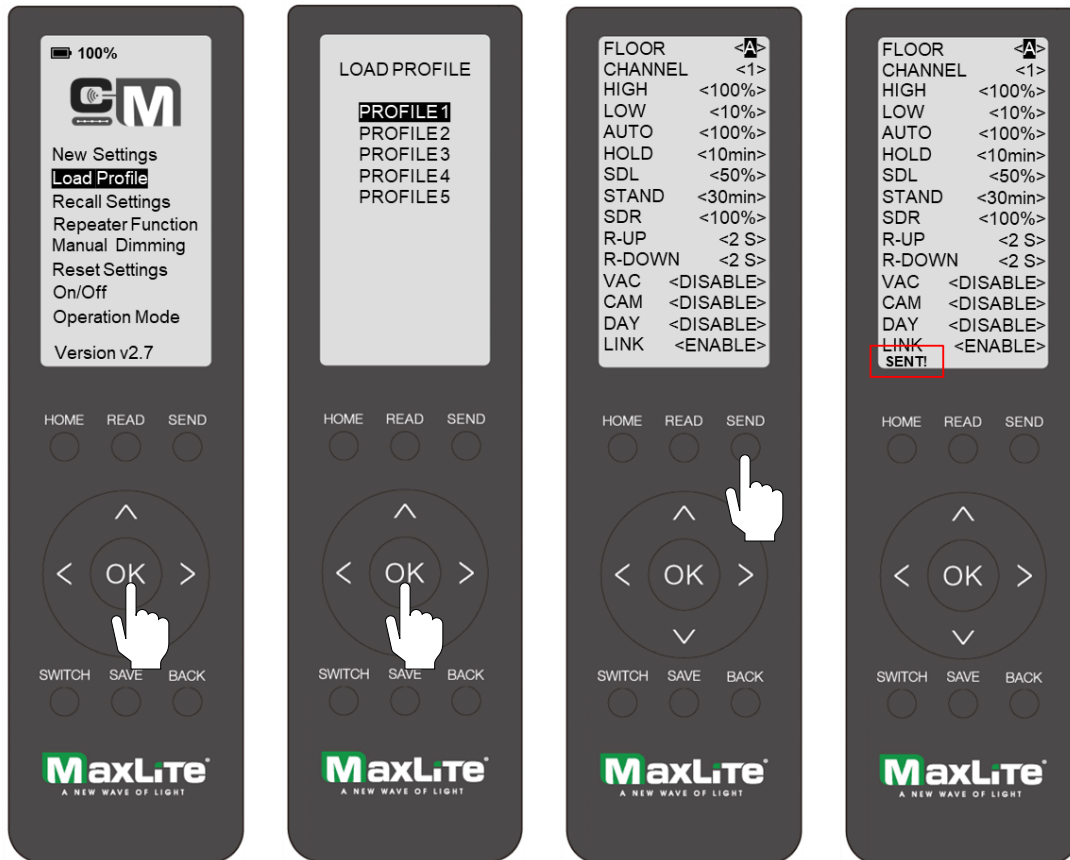

| Fig 2A | Fig 2B | Fig 2C | Fig 2D |

1. Once the **HOME** screen is displayed, navigate to **LOAD PROFILE** and highlight it, then press **OK** to enter **LOAD PROFILE** (Fig 2A).
2. The screen will prompt you to select from 5 PROFILES. Choose a profile and press **OK** to load the settings (Fig 2B). A new screen will appear with all the settings that were previously saved. If using the remote for the first time, preset configurations will appear on the screen. If those settings are adequate, then point the remote at the sensor and press **SEND** to send the loaded profile (Fig 2C). If any of the preset settings need changing, use the navigation pad to adjust those settings and press the **SAVE** button to save the settings to that profile. You will see a momentary **OK** message displayed on the screen indicating the Profile has been updated with the new settings.
3. If the configuration is successfully sent by pressing the **SEND** button, a confirmation message **"SENT!"** will appear at the bottom left of the screen (Fig 2D).

Recall Settings

Point the remote at a programmed sensor to read its current settings. You have the option to save this setting as a new profile. Recall settings are particularly useful when a room is partially commissioned or when there is a hand-off from one installer to another.
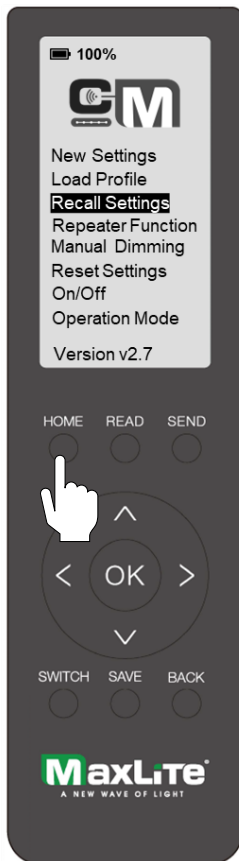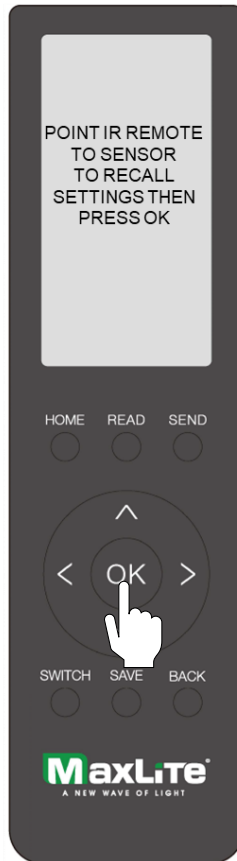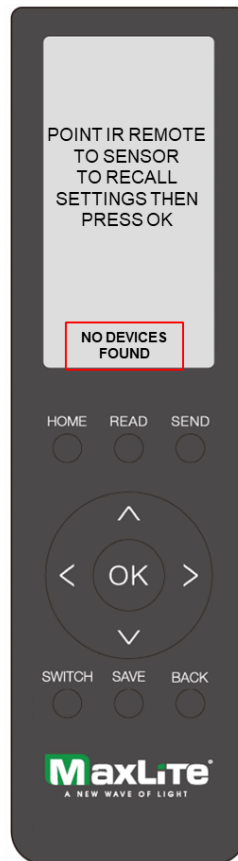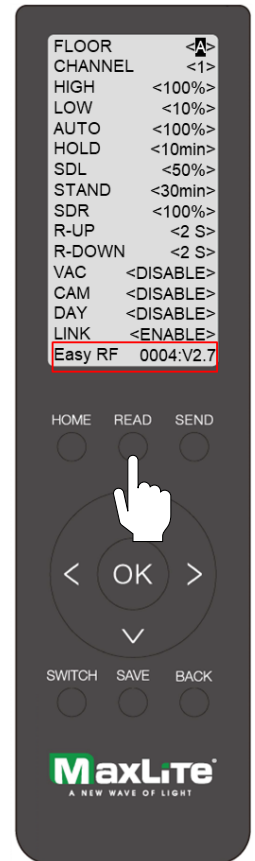

| Fig 3A | Fig 3B | Fig 3C | Fig 3D | Fig 3E |

1. Once the **HOME** screen is displayed, navigate to **RECALL SETTINGS** and highlight it, then press **OK** to enter **RECALL SETTINGS** (Fig 3A).
2. The screen will prompt you to point the RF-REMOTE at a sensor to recall settings and press **OK** (Fig 3B).
3. If the remote does not recall the settings, a message will appear on the screen saying *NO DEVICES FOUND*. Repeat step 2 to successfully recall settings.
4. If the recall is successful, a new screen will appear with all the settings previously saved on the sensor. If the sensor is configured for the first time, the default settings will be displayed (Fig 3D).
5. At this point, you can either **SEND** the settings to another sensor (Follow step #2 in **NEW SETTINGS)** or **SAVE** the settings to a **NEW PROFILE** (Follow step #4 in **NEW SETTINGS**).

NOTE: You can quickly access RECALL SETTINGS by pressing the READ button on the remote. If the recall is successful, the configuration settings will be displayed on the screen (Fig 3E). Remote

version V2.7 enables the READ or RECALL function to also display the firmware version of the sensor (Fig 3E).

Repeater Function

This will let you select a sensor to relay or repeat a message in the channel to extend the range.
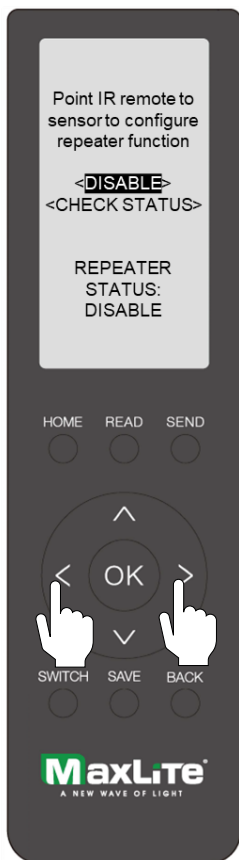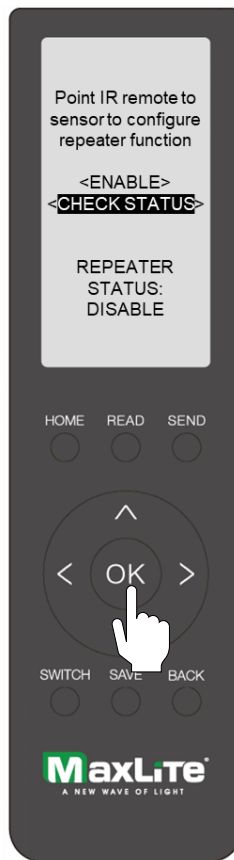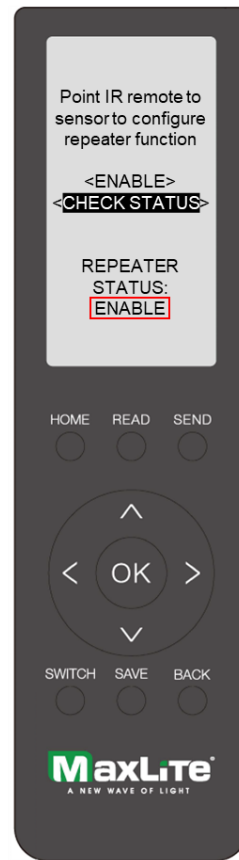

| Fig 4A | Fig 4B | Fig 4C | Fig 4D | Fig 4E |

1. Once the **HOME** screen is displayed, navigate to **REPEATER FUNCTION**, highlight it, and press **OK** to enter **REPEATER FUNCTION** (Fig 4A).
2. The screen will prompt you to point the RF-REMOTE at a sensor to configure the repeater function. Navigate to the first option on the screen to **ENABLE** or **DISABLE** the repeater function (Fig 4B). The repeater function is **DISABLED** by default. Press **LEFT** or **RIGHT** to change the setting to **ENABLE**, and once selected, point the RF-REMOTE at a sensor and press **OK** to send the configuration (Fig 4B).
3. If the remote does not send the setting, a message will appear on the screen saying *NO DEVICES FOUND*. Repeat step 2 to successfully configure the settings.
4. If the configuration is successfully sent, a confirmation message **"SENT!"** will appear at the bottom left of the screen (Fig 4C).

5. To recall or check the status of the repeater function for a sensor, navigate to **CHECK STATUS** on the screen. Point the RF-REMOTE at a sensor and press **OK**. If **CHECK STATUS** is successful, the display message will change to **ENABLE** or **DISABLE** as shown in Fig 4E.

Manual Dimming and Daylight Setting

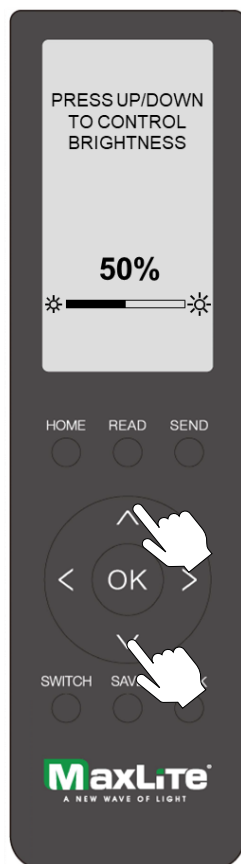Allows you to manually control an individual light's intensity from 0-100%.

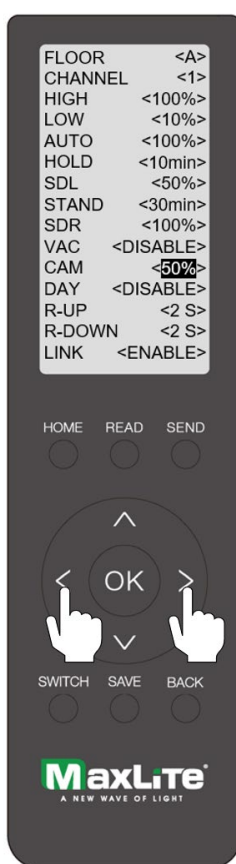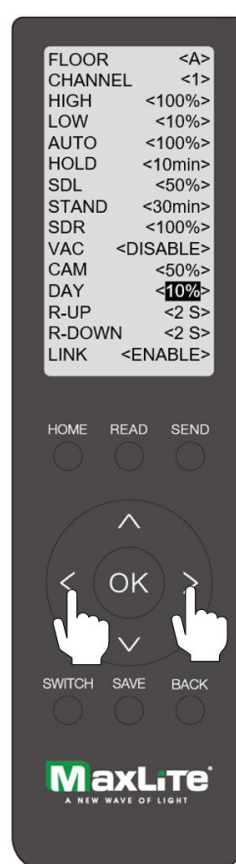| Fig 5A | Fig 5B | Fig 5C | Fig 5D | Fig 5E |

1. Once the **HOME** screen is displayed, navigate to **MANUAL DIMMING**, highlight it, and press **OK** to enter **MANUAL DIMMING** (Fig 5A).
2. The screen will prompt you to control brightness. Point the RF-REMOTE at a sensor and use the **UP** or **DOWN** buttons to increase or decrease the light level from **0–100%** for that individual luminaire (Fig. 5B).
3. Use this step to determine the desired **light level** for the space. Adjust the brightness until the light level is correct and note the dimming percentage shown on the screen.
4. Exit the MANUAL DIMMING menu and return to the sensor profile used to program the luminaire. Set the **CAM (Continuous Adjustment Mode)** value to match the dimming percentage noted in the previous step (Fig. 5C).
5. Set the **DAY (Daylight Threshold)** value to define the minimum dimming level (5–25%) the light can reach when sufficient daylight is available. This ensures the luminaire maintains the task light level while dimming down as natural light increases.

6. After configuring the CAM and DAY settings, point the RF-REMOTE at the sensor and press **SEND**. If the configuration is successful, a **"SENT!"** confirmation message will appear and the luminaire will blink (Fig. 5E).

NOTE: Do not enable CAM (Continuous Adjustment Mode) in spaces where daylight harvesting is not required or where natural light levels are minimal or inconsistent, such as interior rooms, storage areas, corridors without windows, or spaces with frequent manual overrides. Enabling CAM in these applications may result in unnecessary dimming behavior and is not recommended.

Reset Settings

Allows you to reset sensors to factory default settings.

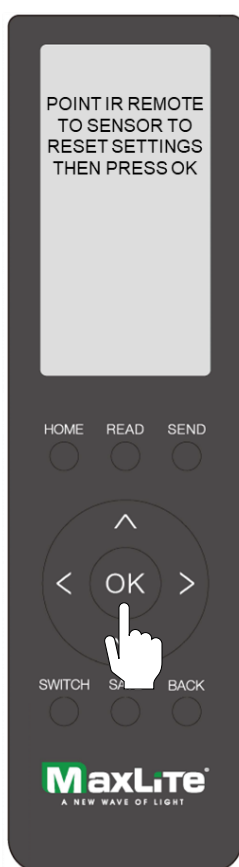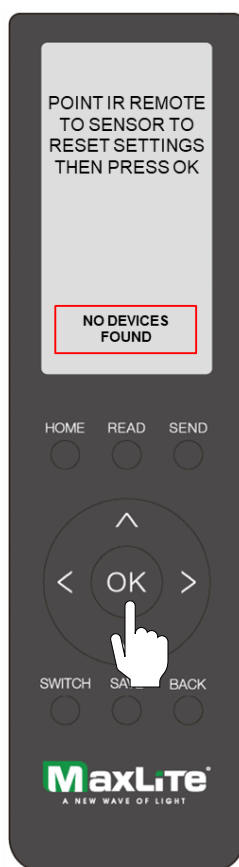
| Fig 6A | Fig 6B | Fig 6C | Fig 6D |

1. Once the **HOME** screen is displayed, navigate to **RESET SETTINGS**, highlight it, and press OK to enter the **RESET SETTINGS** menu (Fig. 6A).
2. The screen will prompt you to point the **RF-REMOTE** at a sensor (Fig. 6B).
3. Point the remote at the sensor and press OK to reset the sensor settings to factory defaults. The luminaire will flash, indicating the command was successful. If the process

fails, a prompt message will display on the screen stating, "*NO DEVICES FOUND*." (Fig 6C).
4. Repeat step 3 until the command is successful (Fig 6D).

On/Off

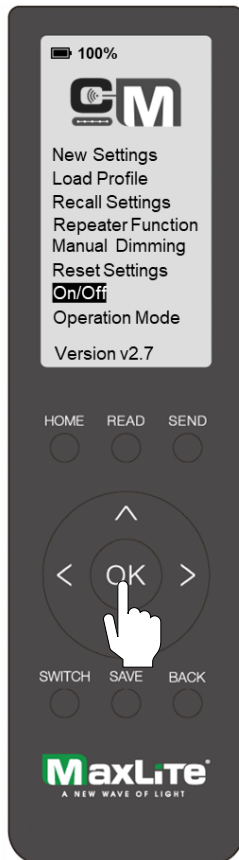Allows you to toggle the luminaires ON or OFF.
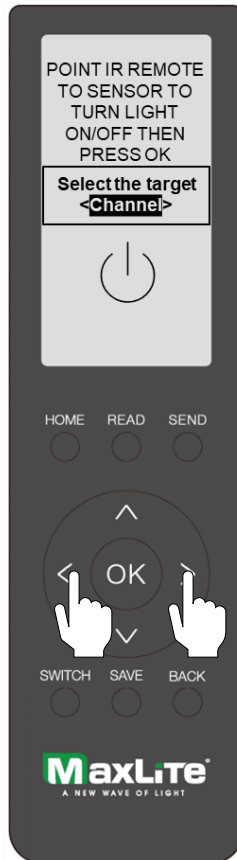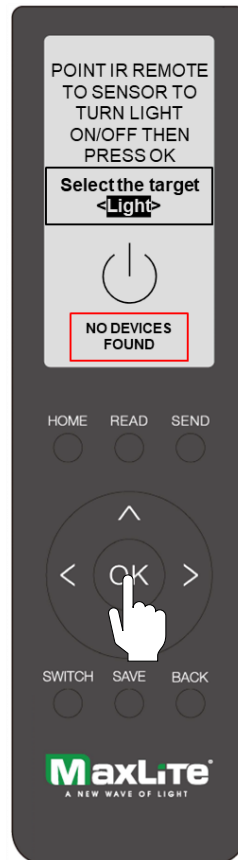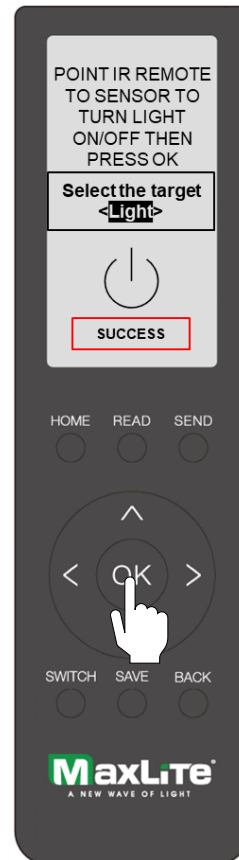

| Fig 7A | Fig 7B | Fig 7C | Fig 7D |

1. Once the **HOME** screen is displayed, navigate to **ON/OFF**, highlight it, and press **OK** to enter the ON/OFF menu (Fig. 7A).
2. Use the LEFT/RIGHT buttons to choose what you want to control: **LIGHT** (one light) or **CHANNEL** (all lights on that channel) (Fig. 7B).
3. The screen will prompt you to point the RF-REMOTE at a sensor. Point the remote at a sensor and press OK to turn the selected light(s) ON or OFF.
4. If the command is successful, the screen will display a *"Success"* message. If it fails, the screen will display *"NO DEVICES FOUND"* (Fig. 7C & 7D).
5. Repeat the previous step until the light(s) respond as expected.

Operation Mode

Allows you to program sensors embedded with different firmware versions, including older versions (V1.12) and newer versions (V1.14+).
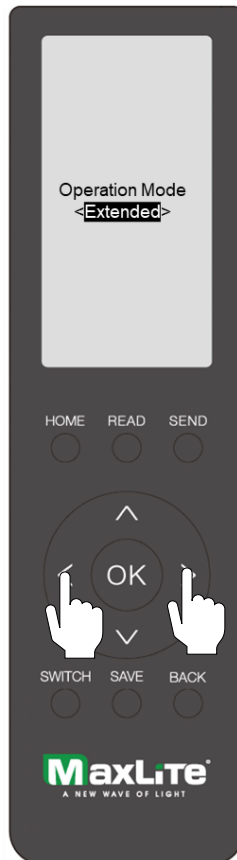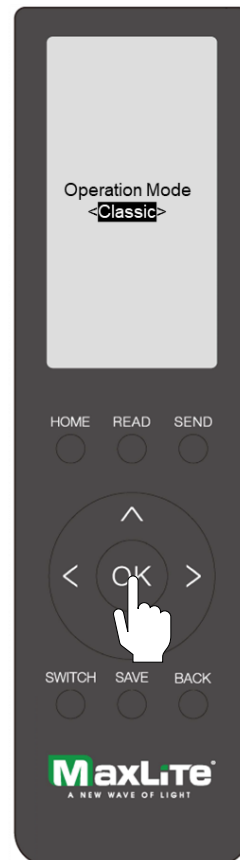
| Fig 8A | Fig 8B | Fig 8C |

1. Once the **HOME** screen is displayed, navigate to **OPERATION MODE**, highlight it, and press **OK** to enter the OPERATION MODE menu (Fig. 8A).
2. When you open this menu, you will see two options: **CLASSIC** and **EXTENDED**. Use the LEFT/RIGHT buttons to switch between them (Fig. 8B & 8C).
3. Select **CLASSIC** when working with **older sensors** (legacy firmware V1.12) (Fig. 8C).
4. Select **EXTENDED** when working with sensors with firmware V1.14 and higher (Fig. 8B).
5. After selecting the desired mode, press **OK** to confirm. If a sensor is not responding, switch the mode and try again. User may verify the sensor firmware by using the READ button and then choose between Classic or Extended.

Switches

The EasyRF system supports personal control by pairing a wall switch to a channel. To pair the battery-operated dual-rocker **WRF2RB-W**:
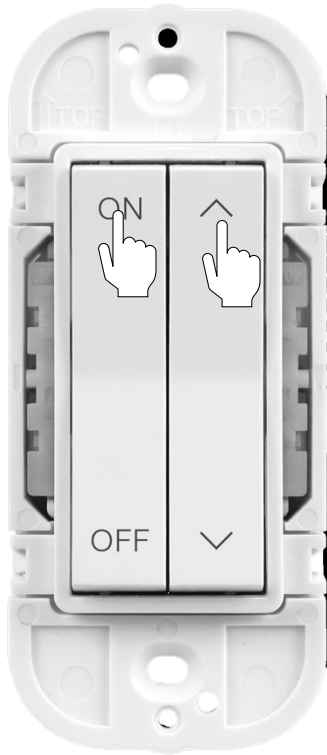
1. Press the **ON** button on the left rocker and the **UP** button on the right rocker together for about 5 seconds, then release.
2. Point the remote at any sensor in that channel and press **SWITCH** on the RF-REMOTE.
3. The lights will blink, indicating the wall switch was paired correctly. The remote display will also indicate the floor and channel to which the remote was paired.

The WRF2RB-W supports *Manual ON, Partial ON, Manual OFF, and Dimming up and down* in 10% increments per click.

20 switches can be added to the same channel to easily control lights in a large room or area.

WRF2RB-W is powered with a CR2430 coin cell battery. Switches are designed to last for many years with moderate usage per day. A green LED indicator becomes visible when the battery approaches end of life.

Repeater Function: Best Practice

A sensor may be enabled as a repeater to help broadcast the signal over longer distances. Note that assigning too many sensors as repeaters may cause the channel to flood resulting in false triggers or a system not performing as intended. Therefore, repeaters should be used sparingly and only in applications where extended coverage is required due to layout limitations preventing direct line of sight to devices. e.g. L shaped corridors or large rooms. Barring such anomalies, a typical room-based layout with a clear line of sight does not require a repeater.

Zoning: Best Practice

Zoning in EasyRF is easy and involves two key concepts: Floors and Channels. The system allows for efficient organization and control of lighting across various spaces without crosstalk or RF interference. When programming the sensor, the user first assigns a Floor and then a Channel.

A Floor represents a logical area that is either an actual building floor as depicted in this 4-story building image or a large area encompassing multiple groups/zones of luminaires. Given RF signals can travel longer distances, Floor assignment helps prevent crosstalk between different areas. As an example, sensors programmed as Floor A will not interfere with sensors programmed as Floor B. EasyRF supports a total of 8 Floors.

A Channel represents a logical group or zone of luminaires that have the same control behavior. Channels ensure that sensors only respond to messages broadcasted on their assigned channel. Like a TV channel, the EasyRF channel ensures that sensors programmed to a particular channel will only be listening to the messages broadcasted on that channel and not a different channel. Users can set up to 50 channels per floor and add up to 50 sensors per channel.

Zoning example for three areas on one floor:
1) *Small Office* – Floor A, Channel 1 (A1)
2) *Conference Room* – Floor A, Channel 2 (A2)
3) *Open Office Space* – Floor A, Channel 3 (A3).

Careful assignment of floors and channels is crucial to prevent crosstalk between areas. Incorrect channel assignment can lead to unintended lighting behaviors. If the *Open Office Space* is set to Channel 1 instead of Channel 3, motion in the *Small Office* will trigger lights in the *Open office space* and vice versa. Proper zoning using Floors and Channels is essential for optimal performance of the EasyRF system.

Troubleshooting

The table below provides examples of common troubleshooting issues that may arise during commissioning of the EasyRF system.

Type	Issue	Resolution
System Operation	Improper selection of channel and floor	EasyRF is designed to operate as a room-based system with RF signals traveling longer distances. To avoid interference, lights can be segregated by Floors and Channels. Each channel functions like a TV remote, where only members subscribed to that channel will receive the broadcast message. Floors could be conceived as broader areas or building floor so that signals from one floor do not interfere with signal from another floor.
	Creating daylight zones within a channel	Daylight zones can be set within a channel by first programming all lights to the correct floor and channel with CAM (daylight harvesting) disabled. Then, select the lights for the daylight zone, enable CAM only for those luminaires, and set daylight thresholds. These lights will respond to ambient light changes, while others remain unaffected.
	Lights in adjacent rooms turning on/off based on motion or manual control	Ensure lights in various rooms are programmed to the correct floor and channel. When using the RF-Remote for commissioning, set the correct channels and floors for different spaces.
	Manual dimming works, but lights return to a different brightness later	Manual dimming only sets a temporary light level. To maintain the desired brightness, update the sensor profile settings and press 'Send' to save the configuration.
Remote Control	Remote not communicating with sensors	Ensure the remote is powered by pressing the Home button. Check and replace the AAA batteries if needed. Aim the remote correctly at the PIR lens and ensure the communication range is less than 50 feet. Use the 'Send' button to communicate with the sensor.
	Sensors not working with remote	Ensure you have the correct sensors installed. Only part numbers beginning with RF-XXXXX will work properly with RF-Remote. For example, the c-Max Basic CN-REMOTE will not work with EasyRF sensors, and RF-REMOTE will not work with c-Max Basic control sensors. Use the READ button on the Remote to verify the sensor firmware and choose the correct Operational Mode on the Remote to communicate with the sensors.

	Lights or sensors not responding to remote commands	Sensors using older firmware (V1.12) may not respond when the remote is set to 'Extended' mode. Navigate to 'Operation Mode', switch to 'Classic', and try again. If working with firmware V1.14 or higher, ensure 'Extended' mode is selected.
Wall Switch Control	Lights not responding to the wall switch	Ensure the wall switch is paired to the correct channel. Point the remote at the closest luminaire, select the Switch button, and test with the on/off button. If the LED indicator on the switch turns green, replace the battery. Check that the wall switch battery (CR2430) is properly installed.
	Certain lights not responding to the wall switch	Ensure that the lights in question are not programmed to the wrong floor or channel.
	Lights not turning on after being programmed	Check the mains power. Without power, the luminaire and sensors won't work. Verify if the sensors are set to vacancy mode instead of occupancy mode. If so, press the ON button on the correctly paired wall switch to turn the lights on. Replace the battery (CR2430) in the wall switch if it's not responding, ensure it is seated properly by inspecting the battery module. When installing a new battery, ensure the positive terminal of the battery is facing upwards.
Light Settings	When to use the Send button	Use the 'Send' button to transfer profile settings to the sensor. This should only be used for sending sensor profile settings and programming sensors
	When to use the Ok button	Use the 'OK' button to save profiles, recall settings, turn on/off luminaires, and set repeater status from the home screen.
	Lights not dimming automatically	The lights might be in manual mode if dimmed using the right rocker on the wall switch. Press the ON button to return to auto mode. Check sensor settings to ensure time delays or bi-level dimming are set correctly.
	Lights not dimming the same way for the entire group	Ensure the Link feature is enabled in sensor profile when programming the sensors. If disabled, each sensor will act independently, causing a "popcorn effect." Also, ensure all members in the same channel have consistent sensor settings, time delays, and the same bi-level standby, high low trim thresholds.
	Lights dim unexpectedly during the day	Check if 'CAM' is enabled. If daylight harvesting is not required for the space, disable CAM and resend the settings to the sensor.