



EasyRF™ LIGHTING CONTROLS

COMMISSIONING GUIDE

Wireless Lighting Control System | 2024



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Overview

EasyRFTM 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.

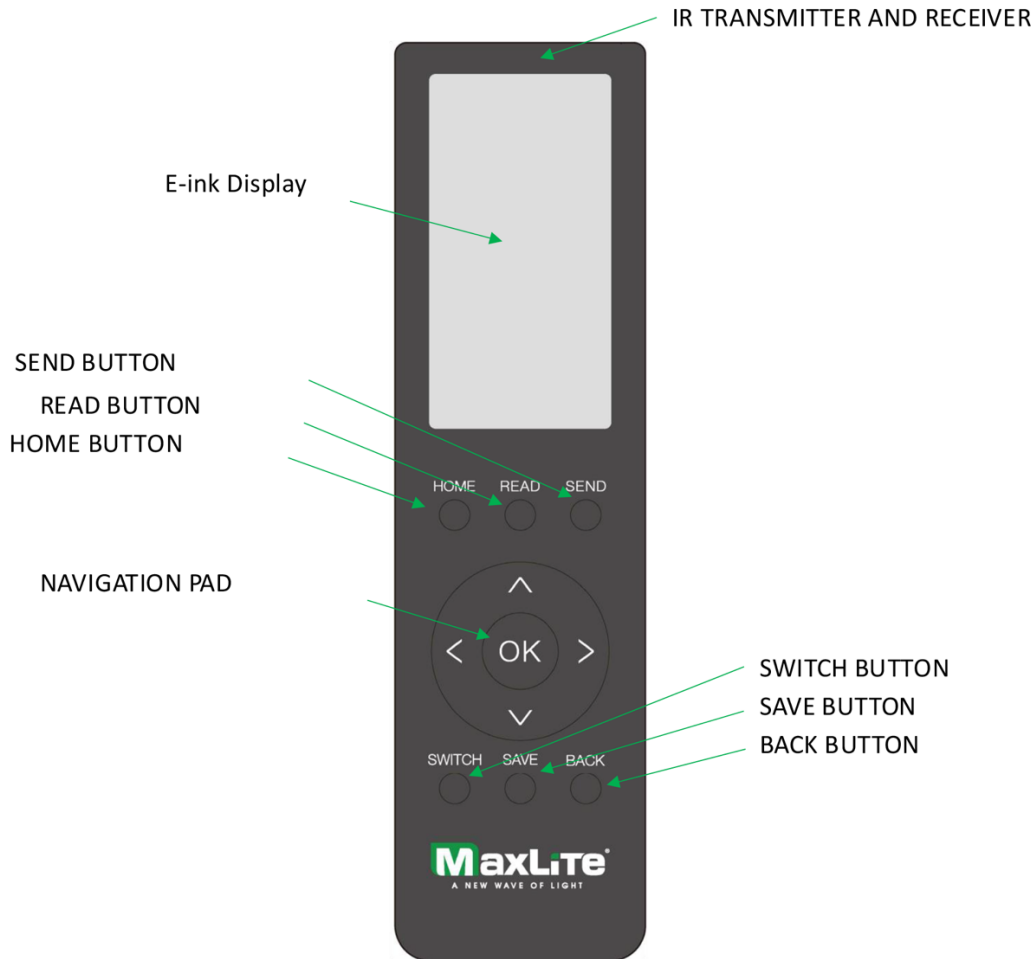
The RF-Remote is a crucial tool for managing c-Max EasyRF controls, offering a perfect blend of simplicity, safety, and advanced functionality. Equipped with an E-ink display, RF-Remote is a portable handheld device engineered for modifying default settings, programming and testing EasyRF devices. Its 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



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 remaining life. When the batteries are running low, the battery symbol on the screen will begin to blink.

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: Enable 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: Let's 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 defaults.

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

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 between 1-100, 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, select any standby dim level between 1-100%. 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 = "50%"

SDR: Adjust PIR Sensitivity Detection Range, 10/50/100%

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

Enable 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

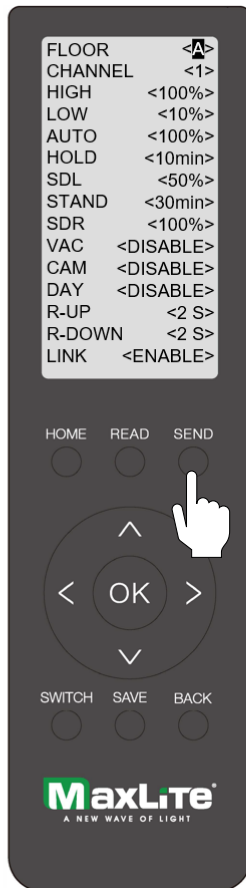


Fig 1B



Fig 1C

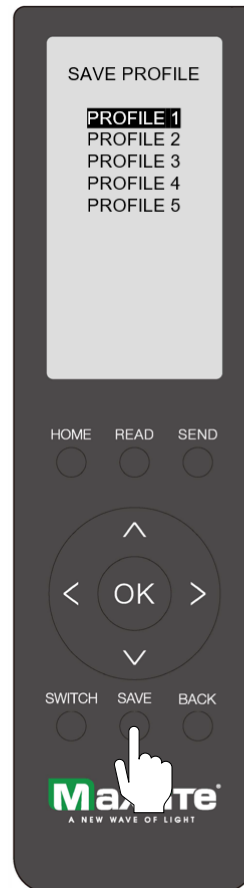


Fig 1D

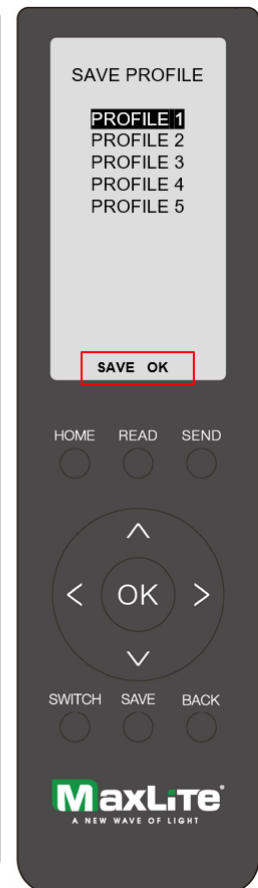


Fig 1E

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

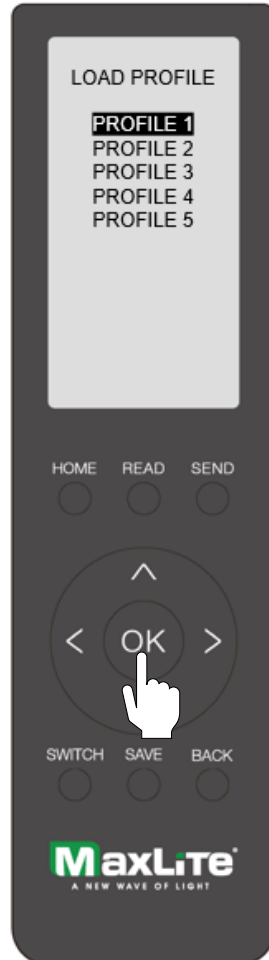


Fig 2B

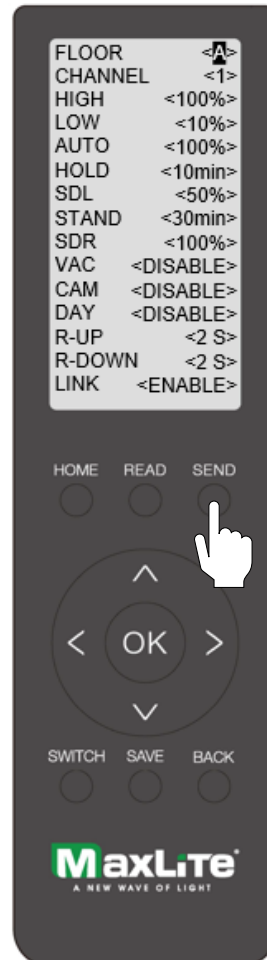


Fig 2C

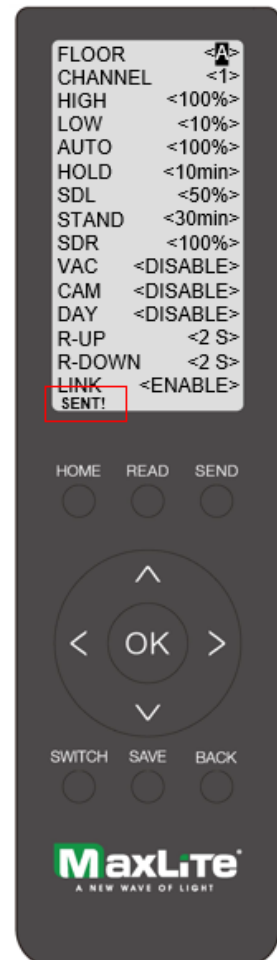


Fig 2D

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 setting 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

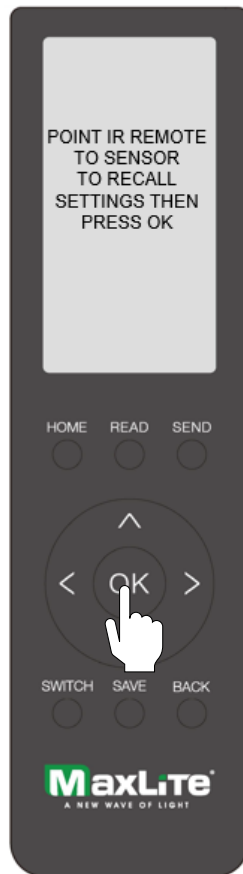


Fig 3B

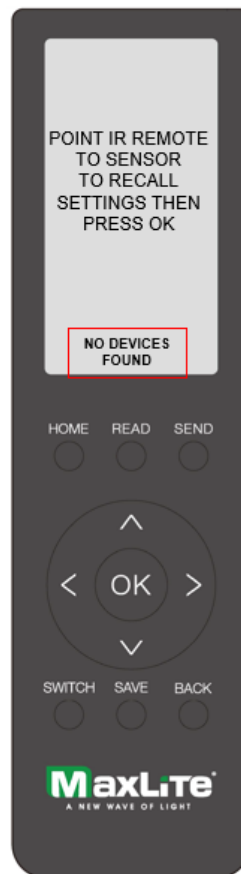


Fig 3C



Fig 3D

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 being 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 3D).

Repeater Function

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



Fig 4A

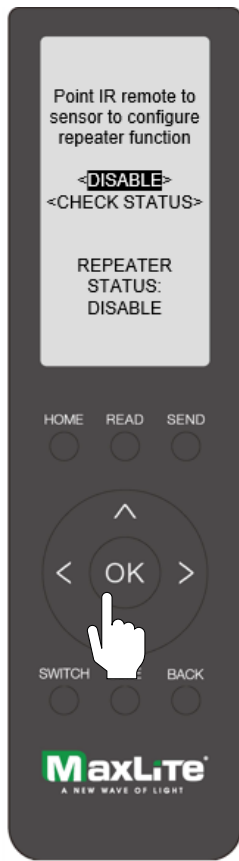


Fig 4B

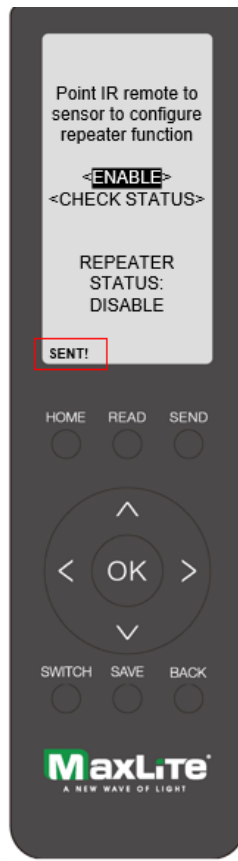


Fig 4C

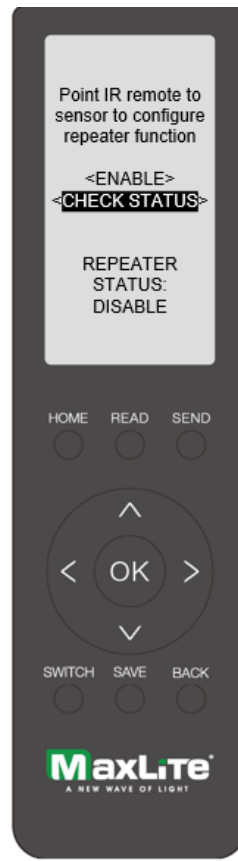


Fig 4D

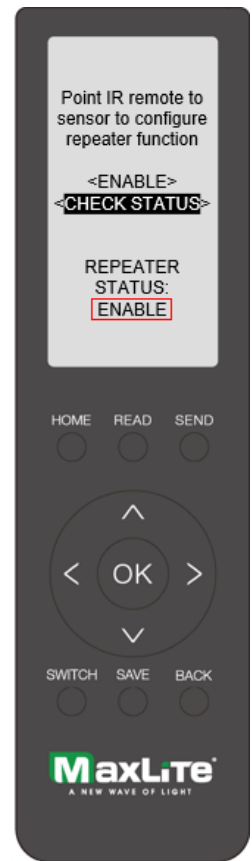


Fig 4E

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 intensity from 0-100%.



Fig 5A

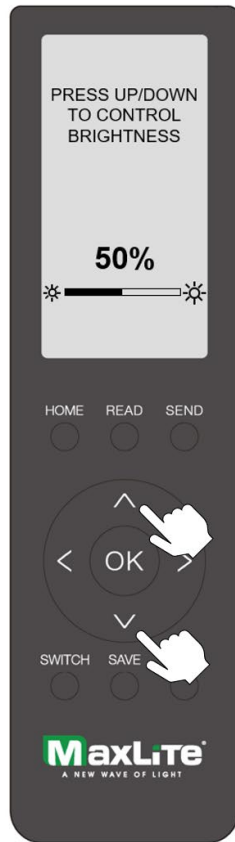


Fig 5B



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 press **UP** or **DOWN** to control the brightness of an individual luminaire. Simply point the **RF-REMOTE** to a sensor and control the brightness levels by pressing **UP** or **DOWN**. (Fig 5B)
3. To set daylight harvesting, use the above two steps to determine the task level lighting required. Adjust the buttons to set the right manual dimming level and note the dimming % on the screen.
4. Go back to the profile that was used to program the sensor and set the **CAM** setting to the dimming value from Step 3 by moving the left and right arrows (Fig 5C)
5. Set the daylight harvesting low trim by setting a value for **DAY** between 5 and 25%. With these steps, the sensors will maintain the task level lighting set under **CAM** and the sensor will dim the lights down to the low trim value set under **DAY** should the natural light exceed the task level light
6. After configuring all parameters, point the remote at the sensor and press **SEND**. If the configuration is successfully sent, a confirmation message "**SENT!**" will appear at the bottom left of the screen. (Fig 5E).

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

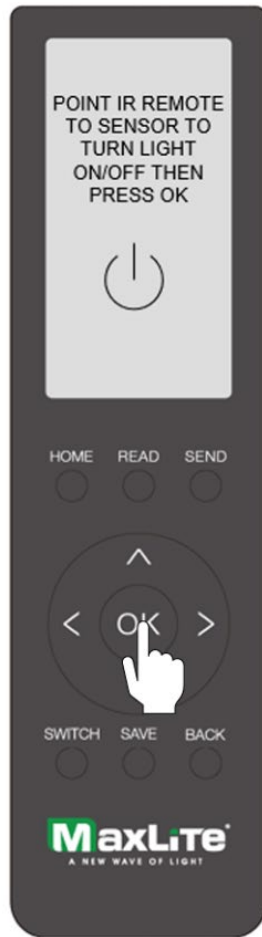


Fig 7B

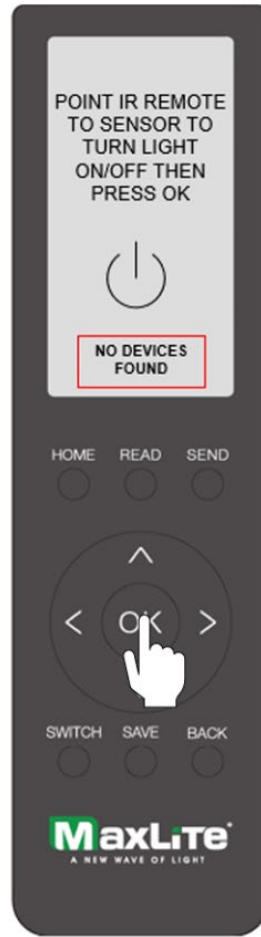


Fig 7C

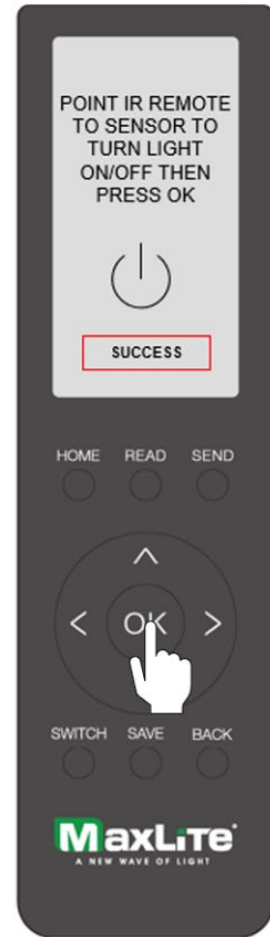


Fig 7D

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. The screen will prompt you to point the **RF-REMOTE** at a sensor. (Fig. 7B).
3. Point the remote at the sensor and press **OK** to turn lights **ON** and **OFF** for a particular luminaire. The screen will display a "*Success*" message indicating the command was successful. If the process fails, a prompt message will display on the screen stating, "*NO DEVICES FOUND*." (Fig. 7C).
4. Repeat step 3 until the command is successful. (Fig. 7D).

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 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.

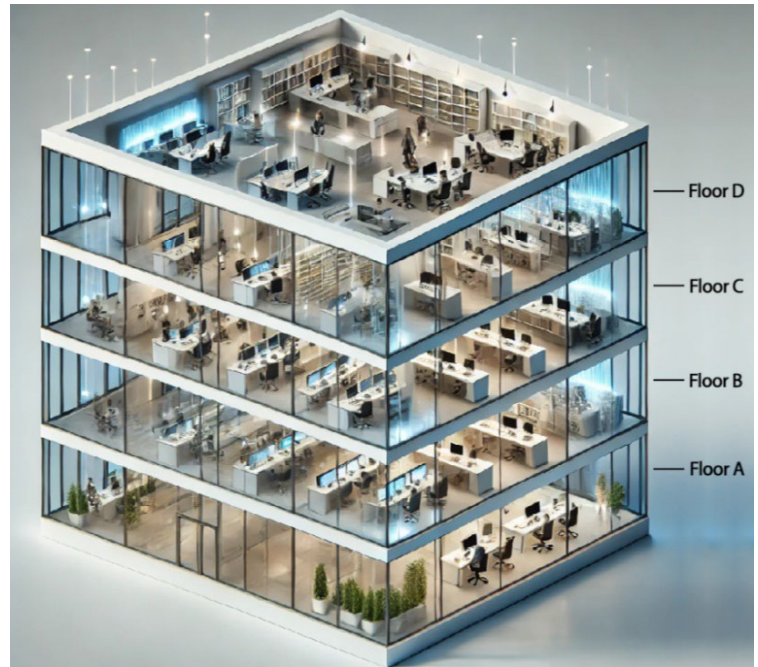
Repeater Function: Best Practice

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 limiting direct line of sight to devices. e.g. L shaped corridor 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 the 4-story building above 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 optional 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.
Remote Control	Remote not communicating with sensors	Ensure the remote is powered by pressing the Home button. Check and replace the AA 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.

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 red, 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 and ensure its seated properly by inspecting the battery module.
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 any 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, especially time delays, and the same bi-level standby, high trim, and low trim thresholds.