MINI-1RL-CASAMBI

User Manual

Made in Italy

FEATURES

- CASAMBI RELAY CONTROL
- Non-dimmable Loads Control
- Power supply AC or DC: 230 Vac (AC/24V INPUT), 24 Vdc (AC/24V INPUT), 12 Vdc (12V INPUT) (SELV recommended)
- Output (RELAY OUT): N.O. (dry contact) relay, drives up to 13 A
- Local Command (PUSH): N° 1 N.O. pushbutton input, programmable for CASAMBI© devices control
- Remote control: via Bluetooth Low Energy (CASAMBI© mobile app)
- Suitable for use in Dry locations
- Extended temperature range
- 100% Functional test

PRODUCT DESCRIPTION

MINI-1RL-CASAMBI is a CASAMBI© Relay with dry-contact N.O. (Normally Open) Relay module for controlling non-dimmable loads and volt-free input (e.g. HVAC systems, automatic garage doors, etc.). It can be controlled remotely via Bluetooth through the CASAMBI© mobile application, Mesh Network, or locally by means one N.O. pushbutton. MINI-1RL-CASAMBI can be supplied by three different Power Supply types: 230 Vac @50/60 Hz, 24 Vdc constant Voltage, or by a 12 Vdc SELV constant voltage and is suitable to drives non-dimmable Loads such as Incandescent/Halogen Mains lamps, LED lamps/drivers, High-Frequency fluorescent lamps, Electronic or Wire Wound Transformers or Motors. The Relay module can drive an output current of up to 13 A (depending to the Load connected) and has the following protections: Line permanent over voltage (non-replaceable fuse), line surge over-voltage, over-temperature.

Through the CASAMBI© mobile application and smartphones/tablets equipped with Bluetooth technology, it is possible to select via Fixtures the preferred behaviour of the product. CASAMBI© mobile application can be downloaded free of charge from the Apple APP Store and Google Play Store.

⇢ For the most up-to-date manual, please visit our website www.dalcnet.com or scan the QR Code on product's label.
⇢ For the correct functioning of the CASAMBI© mobile app, please visit the forum on the Casambi website:
https://support.casambi.com/support/home

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PRODUCT CODE

CODE	POWER SUPPLY	RELAY OUTPUT	LOCAL COMMAND	APP CONFIG.
MINI-1RL-CASAMBI	230 Vac @50/60Hz, 24 Vdc, or 12Vdc	1 x 13 A[1]	N°1 N.O. Pushbutton	CASAMBI© mobile app

Table 1: Product Code

PROTECTIONS

The following table shows the types of ingress and egress protection/detection present on the device.

ACRONYM	DESCRIPTION	TERMINAL	PRESENT
S-OVP	Surge Over-voltage Protection [2]	AC/24V INPUT (L+)	✓
IFP	Input Fuse Protection [2]	AC/24V INPUT (L+), 12V INPUT (+)	✓
OTP	Over Temperature Protection [2]	Internal	✓

Table 2: Protection and Detection Features

REFERENCE STANDARDS

STANDARD	TITLE
EN 60669-2-1:2022	Switches for household and similar fixed electrical installations - Part 2-1: Particular requirements - Electronic control devices
EN 61000-3-2	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤16 A per phase)
EN 61000-3-3	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection
EN 300328	Wideband transmission systems - Data transmission equipment operating in the 2,4 GHz band - Harmonised Standard for access to radio spectrum
EN 301489-1	Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility
EN 301489-17	Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility
EN 300328	Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum

Table 3: Reference standards

[1] The maximum output current depends on the operating conditions, load connected and ambient temperature of the system. For the correct configuration, check the maximum power that can be delivered in the §Technical specifications and §Thermal Characterization sections.
[2] Protections refer to the control logic of the board.

TECHNICAL SPECIFICATIONS

Description	Acronym	Values			Units of Measure	Note
		Min		Max		
POWER SUPPLY INPUTs (AC/24V INPUT, 12V INPUT)						
	-	AC INPUT	24V INPUT	12V INPUT	-	-
AC Nominal Supply Voltage	V_{AC_IN}	110÷240[3]	-	-	Vac	-
DC Nominal Supply Voltage	V_{DC_IN}	-	24[3]	12[4]	Vdc	-
AC Supply Voltage Range	V_{AC_RNG}	99÷264	-	-	Vac	-
DC Supply Voltage Range	V_{DC_RNG}	-	10.8÷13.2	21.6÷26.4	Vdc	-
AC Mains frequency	f_{MAINS}	50/60	-	-	Hz	-
Input current	I_{IN}	≤ 20	≤ 30	≤ 45	mA	-
Power absorption	P_{IN}	≤ 0.85	≤ 0.85	≤ 0.75	W	-
Standby power absorption	P_{IN_STBY}	< 0.25	< 0.25	< 0.20	W	-
Efficiency at full load	E_{FF}	> 95			%	-
OUTPUT (RELAY)						
Load Type	L_{TYPE}	Halogen/Mains lamp, LED lamp & driver, HF fluorescent lamp, transformer, Motor (CosΦ > 0.4)			-	-
Load current (max)		Motor	LED, HF lamp, Transf.	Mains Lamp		-
	I_L	3	6	13	A	
Relay Output type	RLY_{OUT}	Dry-Contacts (N.O. Relay)			-	-
Relay Inrush current (max)	I_{L_IR}	-	-	120	A	For 20 ms
Relay Output Voltage (max)	V_{L_AC}	-	-	240	Vac	-
	V_{L_DC}	-	-	24	Vdc	-
BLUETOOTH (CASAMBI BLE SoC module)						
Operating Frequencies	f_{OP}	2402	÷	2483	MHz	For CASAMBI© BLE SoC
Maximum Emitted Power	$P_{BT\text{-}max}$			7	dBm	Over Bluetooth transmission
Bluetooth version	BT_{VER}	BLE 4.0/5.0, BT mesh			-	Bluetooth Low Energy (BLE)
Communication protocol	CP	CASAMBI			-	-
ENVIRONMENTAL						
Storage Temperature	T_{STORE}	-40	÷	+60	°C	Minimum values defined by design
Working Ambient temperature	T_A	-20	÷	+50	°C	Depends on ventilation conditions
Max Temperature @T_c point	T_C	-	-	+75	°C	-
Working Environment type	ENV_{TYPE}	Dry location			-	-
Working Relative Humidity	RH	0	÷	80	%	Not condensing
Connector type	C_{TYPE}	Screw terminals			-	Max. torque: 4 lb*in / 0,5 Nm
Wiring Section	WS_{SOLID}	0.05	÷	3.3	mm^2	Defined by project
	WS_{STRAND}	30	÷	12	AWG	
Strip length	WS_{STRIP}	6.5			mm	-
Protection class	IP_{CODE}	IP20			-	-
Case material	M_{CASE}	PC/ABS			-	PolyCarbonate/ABS
Packaging unit	UP	1			pcs	-
Dimensions	-	L	A	P		-
	MD	44	57	25	mm	Case
	PD	56	68	35	mm	Packaging
Weight	W	50			g	Including packaging

Table 4: Technical specifications

TC POINT POSITIONING

The following figure show the positioning of the maximum temperature point (*Tc point*, highlighted in red) reached by the electronics inside the enclosure for CE standard, located on the front (Top) side.

[3] On "AC(24V) INPUT" terminal.
[4] On dedicated "12V INPUT" terminal. SELV power supply recommended.

Figure 1: Position of the Tc point

INSTALLATION

ATTENTION! *Installation and maintenance must always be carried out in the absence of voltage. Before proceeding with the connection of the device to the power supply, make sure that the voltage of the power source is disconnected from the system.*

The device should only be connected and installed by qualified personnel. All applicable regulations, legislation, standards, and building codes must be adhered to. Incorrect installation of the device may cause irreparable damage to the device and connected loads.

The following paragraphs show the diagrams of the dimmer's wiring to the local control, the load, and the supply voltage. It is recommended to follow these steps to install the product safely:

1. Safety first: ensure the Mains Supply or the DC Power Supply is disconnected before starting the installation.
2. Electrical connections: connect the electrical wires to the terminals of the device following the next instructions.
   a. Load wiring: connect the load to the "RELAY OUT" terminals (non-polar connection, no need to respect polarity).
   b. Local command wiring: connect the Pushbuttons wires to the "PUSH" terminal, labelled with symbol.
   c. Power Supply wiring: connect the Mains or the DC Power Supply depending on the type of power supply:
      - Mains Voltage: connect the Live wire to the "L(+)" and the Neutral wire to the "N(-)" terminals, labelled as "AC(24V) INPUT";
      - 24 VDC: connect the plus (+24 Vdc) wire to the "L(+)" and the minus (GND) wire to the "N(-)" terminals, labelled as "AC(24V) INPUT";
      - 12 VDC: connect the plus (+12 Vdc) wire to the "+" and the minus (GND) wire to the "-" terminals, labelled as "12V INPUT" symbol.
3. Check the connections: verify that all connections are tightly secured and that there are no exposed wires.
4. Final check: reconnect the supply voltage to power ON the device. Follow the pairing instructions provided on CASAMBI© mobile app and perform a test to ensure that the device is functioning correctly and that all connections are secure.

WIRING DIAGRAM

MINI-1RL-CASAMBI can be powered by 230 Vac @50/60Hz Mains voltage or by a 12 Vdc or 24 Vdc constant voltage SELV power supply. Once load and local control are wired, connect the power supply respecting the polarity conventions to the "AC(24V) INPUT" or "12V INPUT" terminals.

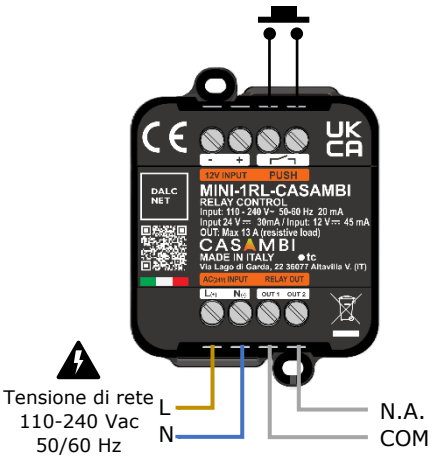


Figure 2: VAC Supply wiring diagram

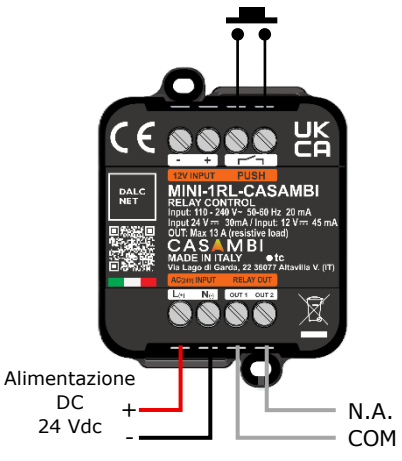


Figure 3: 24 VDC Supply wiring diagram

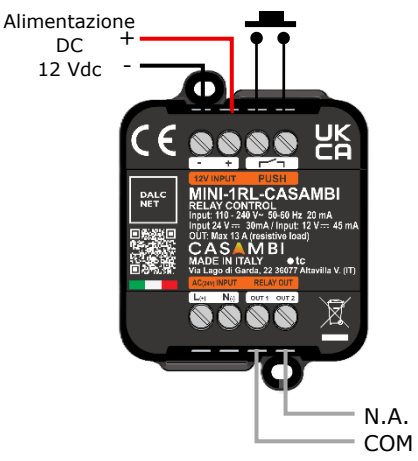


Figure 4: 12 VDC Supply wiring diagram

LOAD WIRING

Following figures show the required wiring diagram for the Load type you need.

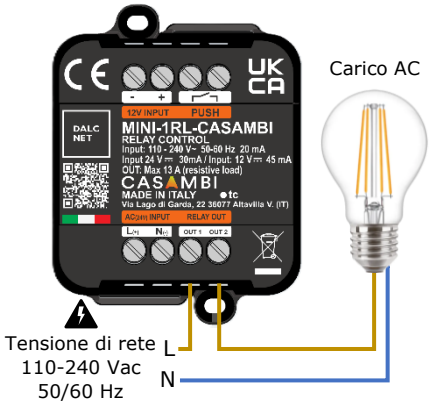


Figure 5: AC Load wiring

Figure 6: DC Load wiring

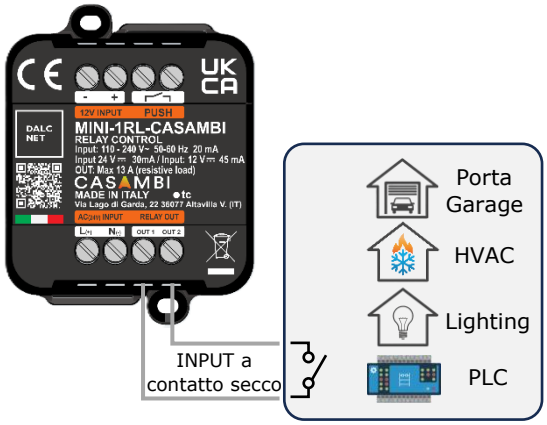


Figure 7: Dry-contact wiring

LOCAL COMMAND WIRING

MINI-1RL-CASAMBI can be controlled via Local Command with a Normally Open (N.O.) pushbutton or voltage-free dry contact connected to the PUSH terminal. No other voltage signals or live parts shall be applied to the PUSH terminal.

To connect the MINI-1RL-CASAMBI to local command, simply connect the pushbuttons to the INPUT terminals. The following image shows the indicated connection diagram for short distances (<100 m).

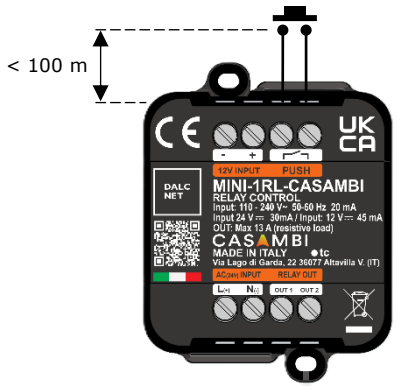


Figure 8: Local Command connection diagram

REMOTE CONTROL: CASAMBI©

CASAMBI© is a lighting control system based on Bluetooth Low Energy (BLE) technology. This technology allows for the creation of customized and flexible wireless lighting networks that can be easily configured and controlled via Android/iOS smartphones or tablets.

PROFILE MAPPING: FIXTURES

MINI-1RL-CASAMBI supports the following fixtures (selectable by CASAMBI© mobile app) that provide different device behaviours.

# PROFILE ID	NAME	DESCRIPTION
36028 (Default)	**RELAY ON/OFF**	**Relay control via virtual switch** Virtual (toggle) switch to control the relay output. The 'All lamps' button, or tapping/sliding on the same profile icon, DOES alter the relay state. The pushbutton input (under "Switches" tab on CASAMBI mobile app) can be used to control other CASAMBI devices in the network, without affect the relay output status.
36030	RELAY PRESS	**Relay Control via Pushbutton** The relay output can be controlled using the pushbutton input (via "PUSH" terminal). When the pushbutton is released, the relay switches OFF instantly. Using the "All lamps" button or tapping/sliding on the profile icon does not affect the relay output state.
36031	RELAY PUSH 1s	**Timed Relay Control via Pushbutton (1s)** The relay output can be controlled by the pushbutton input (via "PUSH" terminal). When the pushbutton is pressed, the relay is triggered for 1 second. Using the "All lamps" button or tapping/sliding on the profile icon does not affect the relay state.
41609	Push Button	**Pushbutton input** The module can be used purely as Pushbutton input (no control of the relay output status), by connecting a N.O. pushbutton to the "PUSH" terminal. Pushbutton item appears under "Switches" tab on CASAMBI mobile app.
18498	Presence Sensor	**Presence Sensor** The module can be used purely as Presence Sensor (no control of the relay output status), by connecting a traditional motion sensor (dry contact) to the "PUSH" terminal to behave as a CASAMBI presence sensor. Sensor item appears under "Sensors" tab on CASAMBI mobile app.

Table 5: Profile list

THERMAL CHARACTERIZATION

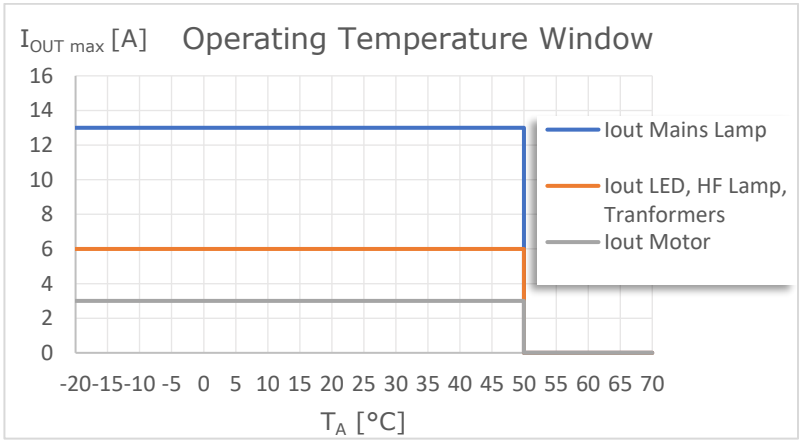


Figure 9: Operating Temperature Window

Figure 9 shows the maximum output current values that can be provided by the MINI-1RL-CASAMBI as a function of the operating temperature[5] (or ambient temperature, T_A) of the operation, summarized below:

- T_A = (-20 ÷ +50) °C ⇢ $I_{OUT\ MAINS} \leq 13$ A
- T_A = (-20 ÷ +50) °C ⇢ $I_{OUT\ LED,HF,Transf.} \leq 6$ A
- T_A = (-20 ÷ +50) °C ⇢ $I_{OUT\ MOTOR} \leq 3$ A

These maximum current (total) values can only be applied under suitable ventilation conditions.

[5] If the product is installed inside an electrical panel and/or junction box, TA refers to the temperature inside the panel/box.

MECHANICAL DIMENSION

Figure 10 details the mechanical measurements and overall dimensions [mm] of the outer casing.

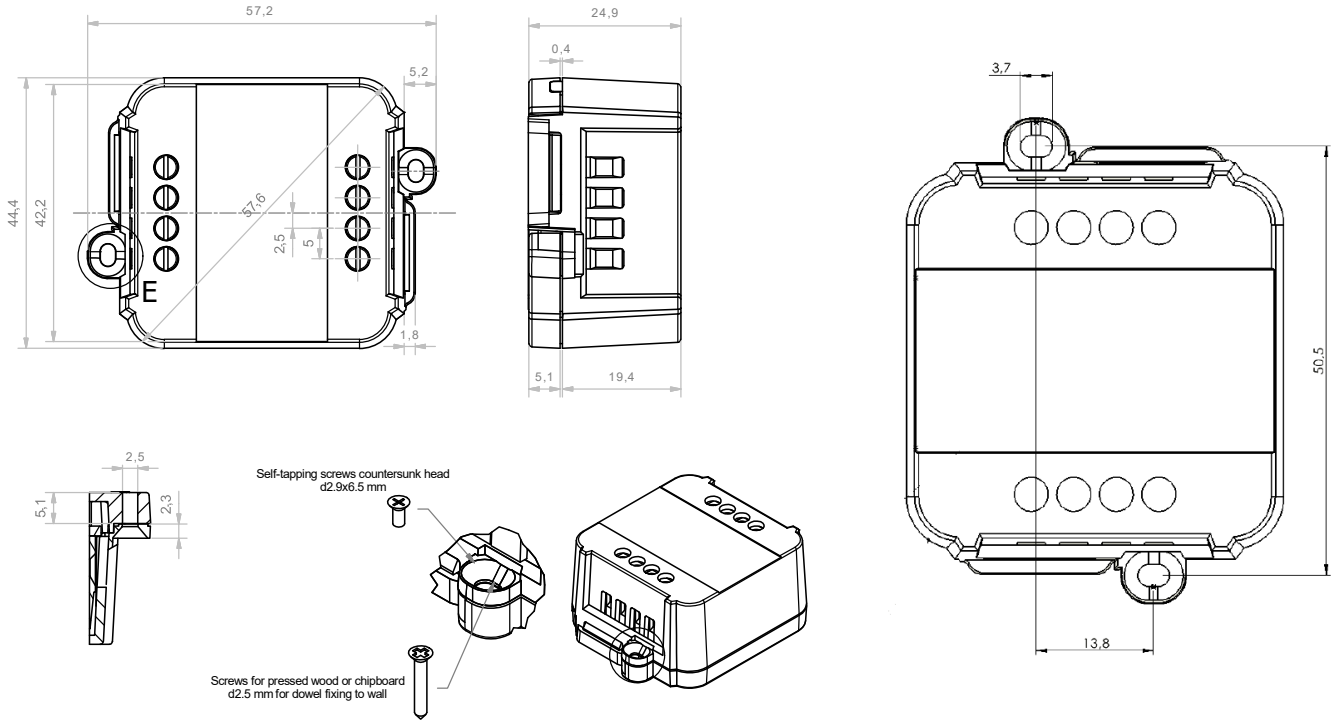


Figure 10: Mechanical dimensions

TECHNICAL NOTES

INSTALLATION

WARNING! Installation and maintenance should always be performed in the absence of DC voltage.
Before proceeding with the installation, adjustment, and connection of the device to the power supply, make sure that the voltage is disconnected from the system.

The device should only be connected and installed by qualified personnel. All applicable regulations, legislation, standards, and building codes in force in the respective countries must be adhered to. Incorrect installation of the device may cause irreparable damage to the device and connected loads.

Maintenance must only be conducted by qualified personnel in compliance with current regulations.

The product must be installed inside an electrical panel and/or junction box protected against surges/overvoltages.

The product is suitable for use in dry places, away from sources of moisture. Installation and use must take place in a dry environment.

The external power supply must be protected. The product, especially the Load's power supply, must be protected by a properly sized circuit breaker with overcurrent protection.

Keep 230 Vac (LV) circuits and non-SELV circuits separate from SELV safety ultra-low voltage circuits and any product connections. It is strictly forbidden to connect, for any reason, directly or indirectly, the 230 Vac mains voltage to the PUSH and/or to the 12V INPUT terminals of the product.

The product must be installed in a vertical or horizontal position, i.e. with the faceplate/label/top cover facing up or vertically. No other positions are allowed. The bottom position, i.e. with the faceplate/label/top cover facing downwards, is not allowed.

During installation, it is recommended to reserve adequate space around the device to facilitate its accessibility in case of future maintenance.

Use in thermally harsh environments may limit the output power of the product.

For devices embedded within luminaires, the T_A ambient temperature range is a guideline to be carefully observed for the optimal operating environment. However, the integration of the device within the luminaire must always ensure proper thermal management (e.g. correct mounting of the device, proper ventilation, etc.) so that the temperature at the T_C point does not exceed its maximum limit under any circumstances. Proper operation and durability are only guaranteed if the maximum temperature of the T_C point is not exceeded under the conditions of use.

POWER SUPPLY AND LOAD

The device must be powered with Mains 230 Vac voltage supply, 24Vdc power supply or with 12Vdc SELV type power supplies with limited current at constant voltage, short circuit protection and power suitably sized according to the specifications indicated in the product data sheet. No other types of power are allowed.

If using the same power supply for both product and load, size the power supply with reference to the load connected to the product. If the power supply is oversized compared to the maximum current drawn, insert an overcurrent protector between the power supply and the device.

Connecting to an unsuitable power supply may cause the device to work outside of the specified design limits, voiding its warranty.

In the case of power supplies equipped with earth terminals, it is mandatory to connect ALL the protection earth points (PE= Protection Earth) to a state-of-the-art and certified earthing system.

The power cables of the device must be correctly sized and must be isolated from any non-SELV voltage wiring.

In case of DC power source, it is recommended not to exceed 10m of connection between the power source and the product. Use double-insulated cables. If you want to use connection cables between the DC power source and the product longer than 10m, the installer must ensure the correct operation of the system. In any case, the connection between the DC power supply and the product must not exceed 30m.

The manufacturer recommends ensuring a cumulative leakage current of less than 3.5 mA on the control circuit.

The device has been designed to work only with Incandescent or mains halogen lamps, LED lamps, LED drivers, High Frequency fluorescent lamps, Electronic or Wire Wound Transformers, and Motors (with CosΦ > 0.4) loads. Connecting and powering unsuitable loads may cause the device to operate outside of the specified design limits, voiding its warranty. In general, the operating conditions of the device should never exceed the specifications indicated in this product data sheet.

It is recommended that the connection cables between the product and the LED module be less than 3m long. Cables must be properly sized and should be insulated from any non-SELV wiring or parts. It is recommended to use double-insulated cables. If you want to use connection cables between the product and the LED module longer than 3m, the installer must ensure the correct operation of the system. In any case, the connection between the product and the LED module must not exceed 30m.

It is not allowed to connect diverse types of loads in the same output channel.

LOCAL COMMAND

The length of the connection cables between the local control (N.O. button or other) and the product must be less than 100m. Cables must be sized correctly. Depending on the connection used, they must be isolated from any non-SELV live wiring or parts. It is recommended to use double-insulated cables, if deemed appropriate also shielded.

All devices and control signals connected to local commands with the symbol , must not supply any type of voltage.

BLUETOOTH LOW ENERGY (BLE) WARNINGS AND MOBILE APP NOTES

The BLE antenna is located inside the device, on the right side near the top of case.

BLE typically has a range of about 10 to 50 meters, depending on the environment and obstacles. Ensure your devices are within this range for reliable communication.

Walls, floors, and other physical barriers can significantly reduce the effective range and signal strength of BLE devices. Position devices to minimize these obstacles.

Other electronic devices, especially those operating on the 2.4 GHz frequency (like Wi-Fi routers), can interfere with BLE signals. Keep BLE devices away from such sources of interference.

Ensure that all devices in your BLE network are compatible with each other and support the same BLE version. Incompatibilities can lead to communication issues.

BLE is designed for low power consumption, but the battery life of your control devices (smartphone or tablet) can still be affected by factors like transmission frequency and data volume. Monitor and manage power settings to optimize battery life.

BLE technology works optimally with non-metallic materials. Therefore, it is not recommended to sourround the device by metal objects or reflective surfaces when using BLE communication.

For reliable communication, make sure that the top surface is not covered or that it is free of metal objects, wiring, or other electronic devices. Any impediments could affect the quality of communication.

To guarantee the best performances and the full use of functions, make sure to download on your device the last release of CASAMBI© mobile app.

Whenever CASAMBI© mobile app requires an upgrade of the profile installed in the LED Dimmers, follow the instruction to do it. This allows you to stay always up to date and benefit of new functions released.

Functionality test are done on all dimmers to ensure the right working. In case the device is still paired to "Dalcnet network", you are asked to unpair it by following the instructions on CASAMBI© mobile app and in §Unpair from CASAMBI© Network section.

LEGAL NOTES

TERMS OF USE

Dalcnet Srl (hereinafter referred to as "the Company") reserves the right to make changes to this device, in whole or in part, without prior notice to the customer. Such changes may affect technical aspects, functionality, design, or any other element of the device. The company is not required to notify you of such changes and that your continued use of the device will constitute your acceptance of the changes.

The company is committed to ensuring that any changes do not compromise the essential functionality of the device and that they comply with applicable laws and regulations. In the event of substantial changes, the company undertakes to provide clear and timely information on the same.

The customer is advised to periodically consult the www.dalcnet.com website or other official sources to check for any updates or changes to the device.

SYMBOLOGIES

CE	All products are manufactured in compliance with European Directives, as reported in the EU Conformity Declaration.
UK CA	All products are manufactured in compliance with UK Regulations and conform to UK safety, health, and environmental requirements for products sold in the UK, as reported in the UK Conformity Assessed.
	The product described in this technical datasheet at the end of its useful life is classified as waste from electronic equipment and cannot be disposed of as unsorted municipal solid waste. **Warning!** Incorrect disposal of the product may cause serious harm to the environment and human health. For correct disposal, inquire about the collection and treatment methods provided by the local authorities.

CASAMBI

CASAMBI© is the official application through which it is possible to configure, in addition to the functions of the MINI-1RL-CASAMBI, also all the different CASAMBI© products equipped with BLE technology.

CASAMBI© mobile app can be downloaded free of charge from the Apple App Store and Google Play Store.

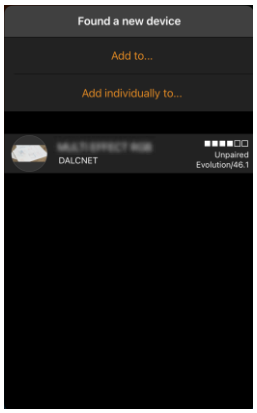
GET IT ON Google Play

Available on the App Store

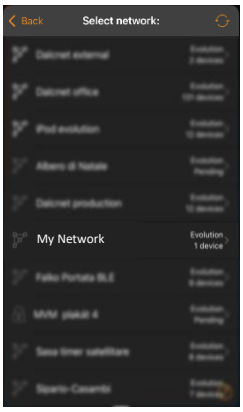
DEVICE SETTINGS

PAIR DEVICE TO CASAMBI© NETWORK

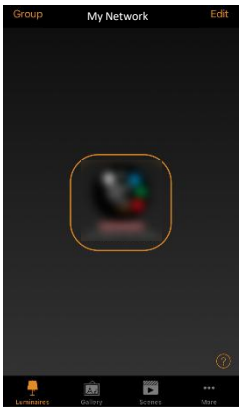
The first time you turn ON a MINI-1RL-CASAMBI device, it will appear in the "Found a new device" section with the default profile preloaded. Perform the following procedure to Pair the device to a CASAMBI© Network.



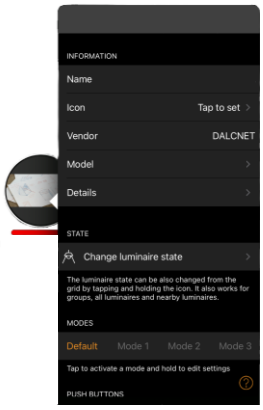
1. Open the CASAMBI© mobile app and Power ON the device. The device to be paired will appear.
2. Select "Add to…" to open the list of available networks.



3. Select the network to pair the device with.



4. Once the device has been inserted in the Network, the default profile will be loaded.



5. Double tap on the profile icon to show the device configuration.

UNPAIR DEVICE FROM CASAMBI© NETWORK

If MINI-1RL-CASAMBI is already connected to a known network and/or you wish to associate it with a new network, you need to unpair the device from the current Network first: please tap the device icon from *Nearby Devices* section, select *Unpair*, and confirm. The unpair process will be started. After the unpairing, the device can be paired to a new Network by following the instructions on above section.

To unpair a device already connected to an unknown Network (for which you don't have the credentials), please follow these steps:

1. Tap the device icon from *Nearby Devices* section, select *Unpair*, and confirm.
2. During the unpair process, turn OFF the Power Supply connected to the MINI-1RL-CASAMBI.
3. Wait 1-2 seconds, then turn the Power Supply ON again.
4. On *Nearby Devices* section the device will be shown as unpaired.

Note: if the power supply is switched OFF and ON again quickly, unpair may not be done properly. Repeat the unpair sequence by allowing 1 or 2 more seconds to elapse between the moment you turn OFF and re-turn ON the Power Supply.

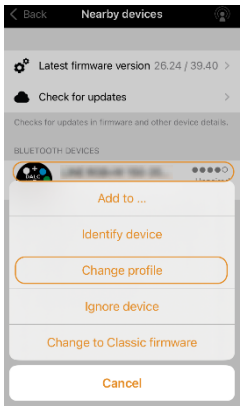
Another method to unpair the device from an unknown Network can be performed using a N.O. push-button connected to the "PUSH" terminal of the MINI-1RL-CASAMBI, following the next steps:

1. Tap the device icon from *Nearby Devices* section, select *Unpair*, and confirm.
2. During the unpair process, quick press the N.O. push-button.
3. After a while, on *Nearby Devices* section the device will be shown as unpaired.

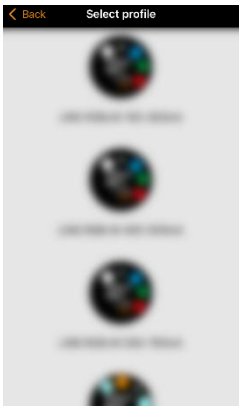
CHANGE PROFILE ON PAIRED DEVICE

Once the technical data of the load to be connected to the device have been verified, it is possible to configure the date and time parameters for the selected profile by loading the Fixture on the controller. To change the Fixture on the MINI-1RL-CASAMBI, follow these steps.

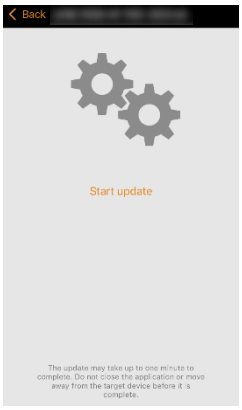
1. Power ON the device and open the CASAMBI© mobile app.
2. Select *Nearby Devices*.



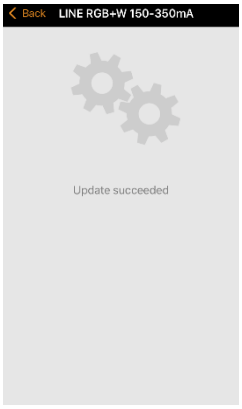
3. Tap on device's icon, then tap on *Unpair*.
4. Second tap on device's icon, then tap on *Change profile*.



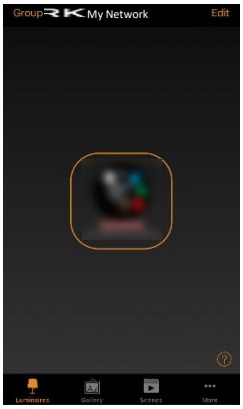
5. Select the desired profile (refer to Table 5).



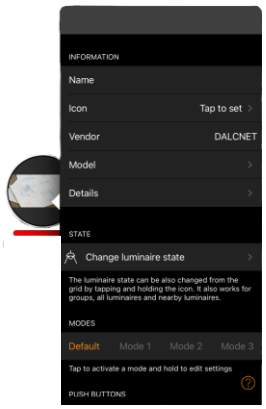
6. Tap *Start Update*.



7. Wait for the profile to load correctly.
8. Back to *Nearby Devices* and select *Add to 'Network name'* to pair on the previous Network.



9. Once the device has been added to the Network, go back to *Luminaires* sheet and double tap on the profile icon to show the device configuration.



10. Hold tap on profile icon to show the profile settings.

11. Inside the fixture configuration, the relay status value can be customized by the provided toggle or button (depends to the selected Fixture).