MICRO-1CV-CASAMBI

User Manual

Made in Italy

FEATURES

- CASAMBI LED DIMMER
- WHITE and MONOCHROMATIC Light Control
- Power Supply (DC IN): 12-24-48 Vdc (SELV)
- Output (LED): constant voltage output (= DC IN) modulated for Resistive LED-strips and dimmable LED-module load
- Remote control: via Bluetooth Low Energy (CASAMBI mobile app)
- Local Command (PUSH): N° 2 inputs for N.O. pushbuttons
- Device configuration via CASAMBI mobile application, parameters can be set (via Fixture):
  - Dimming curve
  - PWM modulation frequency: 300, 600 or 1200 Hz
  - Adjusting the brightness up to completed off (Dim to Dark)
  - ON/OFF and brightness soft dimming
- Detection & Protection Features
- Memory function: stores the last brightness level set
- Suitable for use in Dry locations
- Extended temperature range
- Long Range on Evolution networks supported
- 100% Functional Test - 5 Years warranty

PRODUCT DESCRIPTION

MICRO-1CV-CASAMBI is a single-channel LED dimmer, PWM (Pulse Width Modulation) modulated at Constant Voltage (CV) and controlled remotely via Bluetooth through the CASAMBI mobile application or locally by means of two N.O. (Normally Open) push-buttons.
MICRO-1CV-CASAMBI can deliver a maximum output power up to 78 W (@12V) or 150 W (@24/48V) and has the following protections: over-voltage and under-voltage protections, reverse polarity protection, input fuse protection and open-circuit protection.

Through the CASAMBI mobile application it is possible to configure multiple parameters, including Dimming curve, PWM modulation frequency (300, 600 or 1200 Hz), Dim to Dark behaviour, and Minimum Brightness level: down to 1%.

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

PRODUCT CODE

CODE	POWER SUPPLY	OUTPUT LED [1]	LOCAL COMMAND	CONFIG. APP
MICRO-1CV-CASAMBI	12-24-48 Vdc	1 x 6.5 A (max) @12V 1 x 6.25 A (max) @24V 1 x 3.1 A (max) @48V	N° 2 N.O. Pushbuttons	CASAMBI

Table 1: Product Code

DETECTION AND PROTECTION

The following table shows the types of incoming and outgoing protection/detection present on the device.

ACRONYM	DESCRIPTION	TERMINAL	PRESENT
OTP	Over Temperature Protection	-	✗
OVP	Over Voltage Protection[2]	DC IN	✓
UVP	Under Voltage Protection[2]	DC IN	✓
IFP	Input Fuse Protection[2]	DC IN	✓
RVP	Reverse Voltage Polarity[2]	DC-IN	✓
SCP	Short-Circuit Protection	-	✗
OCP	Open-Circuit Protection	LED	✓

Table 2: Detection and Protection functionalities

REFERENCE STANDARDS

MICRO-1CV-CASAMBI complies with the regulations shown in the table below.

STANDARD	TITLE
TBD	Certification in progress

Table 3: Reference standards

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

TECHNICAL SPECIFICATIONS

Description	Name	Values			Unit of Measure	Note
		Min		Max		
INPUT (DC IN terminal)						
Nominal Supply Voltage	V_{IN}	12	24	48	Vdc	-
Supply Voltage range	V_{IN-RNG}	10.8	÷	52.8	Vdc	-
Efficiency at full load	E_{FF}		> 95		%	-
Standby power absorption	P_{STBY}		< 0.5		W	-
OUTPUT (LED terminal)						
Output Voltage	V_{OUT}		= V_{IN}		-	-
Output Current (max) [3]	-	@12V	@24V	@48V	-	-
	$I_{OUT-max}$	6.5	6.25	3.1	A	@40°C
Rated Power Output	P_{OUT}	78	150	150	W	-
Load type	L_{TYPE}		LED		-	Defined by design
LOCAL COMMAND (PUSH terminal)						
Number of push-button inputs	N_{PUSH}		2		-	-
Input type	IN_{TYPE}		Dry contact input		-	-
DIMMING						
Dimming Curves	C_{DIM}		Linear		-	-
Dimming Method	M_{DIM}		Pulse Width Modulation (PWM)		-	-
Dimming Frequency (PWM)	FDIM	300	600	1200	Hz	Via fixture
Dimming Resolution	Res_{DIM}		1176		Step	Defined by design
Dimming Range	RNG_{DIM}	1	÷	100	%	-
BLUETOOTH (CASAMBI BLE SoC module)						
Operating Frequencies [4]	f_{OP}	2402	÷	2480	MHz	For CASAMBI BLE SoC
Maximum Emitted Power [4]	P_{BT-max}	-	-	8	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	-10	÷	+60	°C	Minimum values defined by design
Max Temperature @T_c point	T_C	-	-	+70	°C	-
Connector Type	CON_{TYPE}		Push-in terminals		-	-
Wiring Section	WS_{SOLID}	0.5	÷	1.5	mm^2	Defined by design
	WS_{STRAND}	20	÷	16	AWG	
Strip length	WS_{STRIP}		10		mm	-
Protection class	IP_{CODE}		IP20		-	-
Casing Material	MC		PC/ABS		-	Polycarbonate/ABS
Mechanical Dimensions	-	L	H	D	-	-
	MD	71.7	21	15.5	mm	
Net Weight	W_N		14		g	-

Table 4: Technical specification

[3] Depends on the ventilation conditions. This value is measured at 40°C, it is maximum ambient temperature.
[4] The parameters are derived from the configuration of the Casambi module.

T_C Point Positioning

The figure below shows the positioning of the maximum temperature point (*T_c point*, highlighted in red) reached by the electronics inside the enclosure. It is located on the front side (Top) near the LED output connector.

Figure 1: T_c point position

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 connection to the load, the local control, and the supply voltage. It is recommended to follow these steps to install the product safely:

1. Safety first: make sure the SELV power supply is disconnected from the mains before starting installation.
2. Electrical Connections: connect the electrical wires to the terminals of the device by following the instructions below.
   a. LED Load Wiring: connect the LED load to the "+" (red) and "-" (black) terminals of the "LED" terminal block.
   b. Local control wiring: connect the N.O. buttons to the "PUSH" terminals with the symbol ⌐¬. Make sure you do not connect live parts to the PUSH terminals.
   c. Power Wiring: connect a 12 Vdc, 24 Vdc, or 48 Vdc (depending on LED load plate data) constant voltage SELV power supply to the "+" (red) and "-" (black) terminals of the "DC IN" terminal block.
3. Check the connections: check that all connections are securely fastened and that there are no exposed copper strands.
4. Final check: reconnect the SELV power supply to the mains voltage and switch on the device. Run a test to make sure your device is working properly and that all connections are secure, then follow the pairing instructions provided by the CASAMBI mobile app.

   Note: The installer is responsible for verifying the installation.

Wiring Diagram

MICRO-1CV-CASAMBI has 1 output channel that can drive resistive single-color / white LED strip. The following connection diagram (Figure 2) allows you to drive the LED load.

Figure 2: Wiring diagram

LOCAL CONTROL WIRING

MICRO-1CV-CASAMBI can be locally controlled via two Normally Open (N.O.) push-buttons or voltage-free dry contacts. No other voltage signals shall be applied to these contacts.

To connect the MICRO-1CV-CASAMBI to local commands, simply connect the pushbuttons to the PUSH1 and PUSH2 terminals. The following image shows the indicated connection diagram for short distances (<10 m).

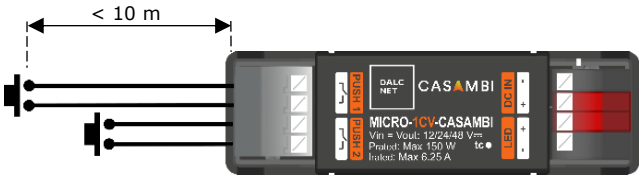


Figure 3: Local Command connection diagram for Short Distances

POWER SUPPLY WIRING

MICRO-1CV-CASAMBI can be powered by a 12 Vdc, 24 Vdc or 48 Vdc constant voltage SELV power supply, depending on the operating voltage of the LED load. Once the load and Local Control are connected, connect the power supply to the "+" and "-" terminals of the DC IN terminal block.

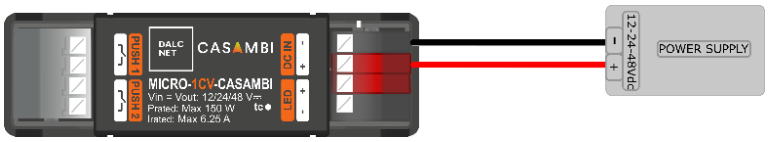


Figure 4: Power Supply wiring diagram

LOCAL CONTROL: PUSHBUTTON

MICRO-1CV-CASAMBI has two terminals for N.O. pushbutton or dry contact input, through which different operating parameters can be managed. Each action on the pushbutton activates a specific function for the type of control selected via CASAMBI mobile app. CASAMBI mobile app provides up to 7 operating modes that can be associated with the button press, listed below:

1. *Controls a Luminaire*: the pushbutton takes over ON/OFF control and luminaire brightness functions.
2. *Controls an Element*: the pushbutton takes over ON/OFF functions dedicated to a device element inside the CASAMBI network and to adjust the element value.
3. *Control a Group*: the button takes on function dedicated to control a group of LED modules and their brightness.
4. *Control scene*: the button takes over brightness adjustment and turns ON/OFF the programmed scenario.
5. *Control all Luminaires*: the button takes over ON/OFF control and brightness functions of all luminaires.
6. *Cycles scenes*: the button takes over brightness adjustment and selection through the programmed scenario list.
7. *Active/Standby*: the button takes over brightness adjustment and selection between two programmed scenes.

Following table resumes the Pushbutton functionality of all operating modes.

ACTION / FUNCTION	QUICK PRESS	LONG PRESS (> 1s)
Controls a Luminaire	Turns ON/OFF the selected Luminaire	Brightness adjustment (Dimming)
Controls an Element	Turns ON/OFF the selected device element	Element value adjustment
Controls a Group	Turns ON/OFF the configured Group of devices	Brightness adjustment (Dimming)
Control Scene	Turns ON/OFF the configured Scene	Brightness adjustment (Dimming)
Control all Luminaires	Turns ON/OFF all the Luminaires	Brightness adjustment (Dimming)
Cycles Scenes	Cyclic scroll through the list of scenes	Brightness adjustment of current scene (Dimming)
Active / Standby	Switches between two programmed scenes	Brightness adjustment of current scene (Dimming)

Table 5: Pushbutton functionality

For all other functions consult the documentation of the CASAMBI mobile app at: https://support.casambi.com/support/home

THERMAL CHARACTERIZATION

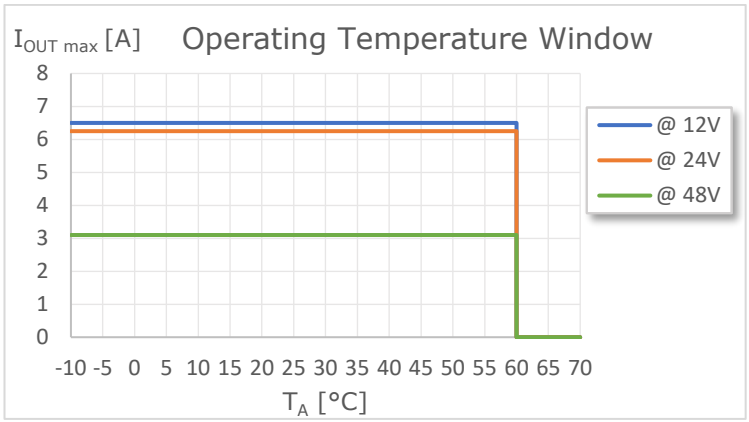


Figure 5: Operating Temperature Window

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

- T_A = (-10 ÷ +60)°C ⇢ $I_{OUT\_@12V} \leq 6.5A$
- T_A = (-10 ÷ +60)°C ⇢ $I_{OUT\_@24V} \leq 6.25A$
- T_A = (-10 ÷ +60)°C ⇢ $I_{OUT\_@48V} \leq 3.1A$

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

DIMMING CURVES

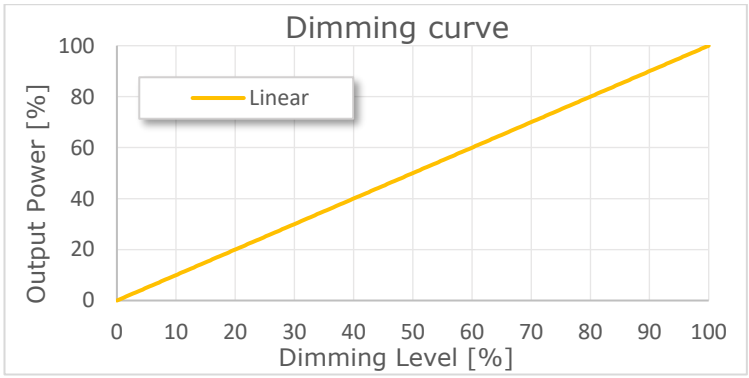


Figure 6: Dimming Curve

The MICRO-1CV-CASAMBI only supports the Linear dimming curve shown in Figure 6. No other curves are available.

MECHANICAL DIMENSIONS

Figure 5 details the mechanical measurements and the overall dimensions [mm] of the outer casing.

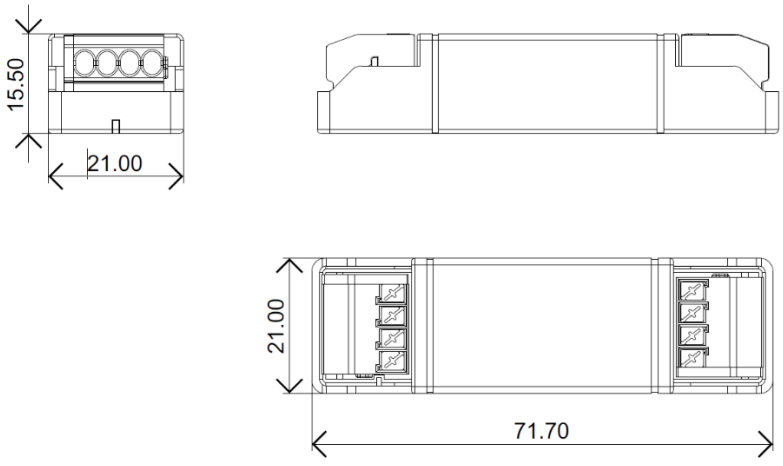


Figure 7: Mechanical dimensions

[5] In the event that the product is installed inside an electrical panel and/or junction box, T_A refers to the temperature inside the panel/box.

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 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 product (control terminals included).

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 or updates (e.g. via smartphone).

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 only with 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.

Size the power supply with reference to the load connected to the device. 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 with reference to the connected load and must be isolated from any non-SELV voltage wiring. Use double-insulated cables.

It is recommended not to exceed 10m of connection between the power source and the product. If you want to use connection cables between the 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 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 with Resistive LED loads only. 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 the product data sheet.

Observe the intended polarity between the LED module and the device. Any polarity reversal results in no light emission and can often damage the LED modules.

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 10m. 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.

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 of your control devices 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

Digimax 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.

SYMBOLS

CE	All products are manufactured in compliance with European Regulations, as reported in the Declaration of Conformity.
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.
	Independent lamp Controlgear: lamp controlgear consisting of one or more separate elements so designed that it can be mounted separately outside a luminaire, with protection according to the marking of the lamp controlgear and without any additional enclosure.
SELV	"Very Low Safety Voltage" in a circuit isolated from the mains supply by insulation not less than that between the primary and secondary circuits of a safety isolation transformer according to IEC 61558-2-6.
	At the end of its useful life, the product described in this data sheet is classified as waste from electronic equipment and cannot be disposed of as unsorted municipal solid waste. **Warning!** Improper disposal of the product may cause serious harm to the environment and human health. For proper disposal, inquire about the collection and treatment methods provided by the local authorities.

Table 6: Device's symbols

CASAMBI

CASAMBI is the official application through which it is possible to configure, in addition to the functions of the MICRO-1CV-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.

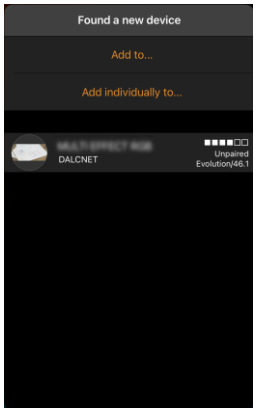
GET IT ON Google Play

Available on the App Store

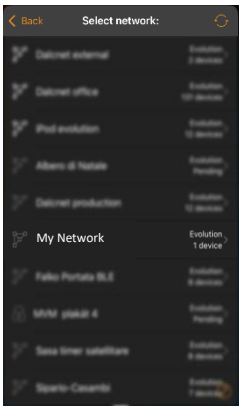
DEVICE SETTINGS

PAIR DEVICE TO CASAMBI NETWORK

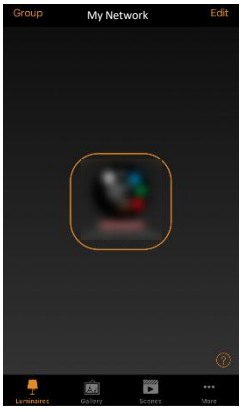
The first time you turn ON a MICRO-1CV-CASAMBI device, it will appear in the "Found a new device" section with the default profile preloaded. Perform the following procedure to Pair the device to a CASAMBI Network.



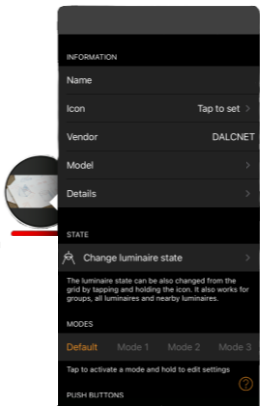
1. Open the CASAMBI mobile app and Power ON the device. It will appear in the list.
2. Select *Add to…* to open the list of available networks.



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.

Note: MICRO-1CV-CASAMBI supports all the Radio Settings modes, including Long Range. See the following website for more information ⇢ https://support.casambi.com/support/solutions/articles/12000074087-create-a-network

UNPAIR DEVICE FROM CASAMBI NETWORK

If MICRO-1CV-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 (refer to 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 MICRO-1CV-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.

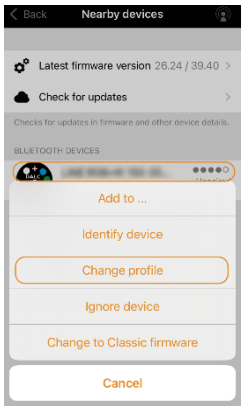
Another method to unpair the device from an unknown Network can be performed using a N.O. push-button connected to the "PUSH" terminal of the MICRO-1CV-CASAMBI, following the next steps:

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.

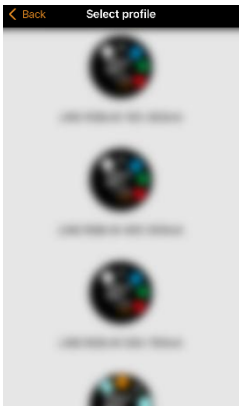
CHANGE PROFILE ON PAIRED DEVICE

Once the technical data of the load to be connected to the device have been verified, it is possible to load the dedicated Fixture/Profile on the controller according to the PWM frequency desired. To change the Fixture on the MICRO-1CV-CASAMBI, follow these steps.

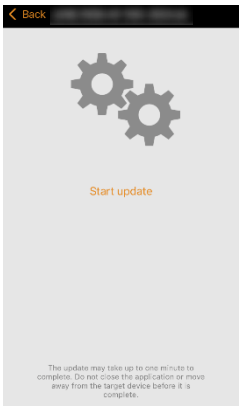
1. Power ON the device and open the CASAMBI mobile app.
2. Select *Nearby Devices*.



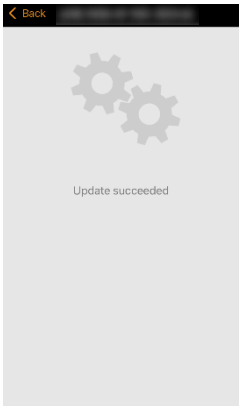
3. Tap on device's icon, then tap on *Unpair*.
4. Second tap on device's icon, then tap on *Change profile*.



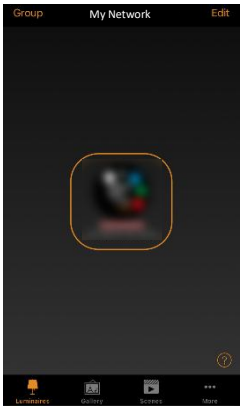
5. Select the desired profile (refer to Table 7).



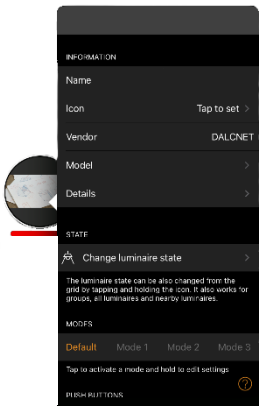
6. Tap *Start Update*.



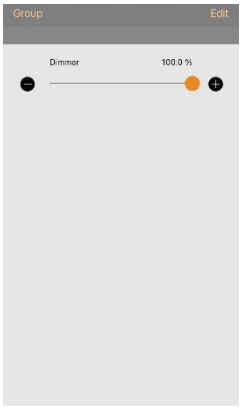
7. Wait for the profile to load correctly.
8. Back to *Nearby Devices* and select *Add to 'Network name'* to pair on the previous Network.



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.



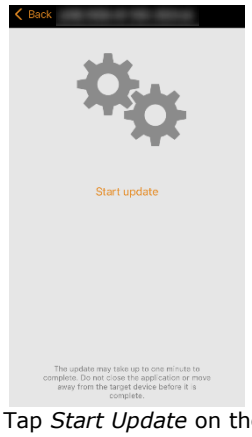
11. Inside the fixture configuration, the LED module brightness can be set by provided slider.

FIRMWARE UPDATE ON PAIRED DEVICE

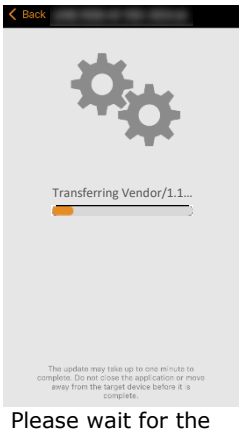
From CASAMBI mobile app it is possible to update the device's firmware. To check and load any update to the MICRO-1CV-CASAMBI, follow these steps.

1. Power ON the device and open the CASAMBI mobile app.
2. Select *Nearby Devices*, *More* sheet, then tap the Meatball menu ⋯ and *Check for updates*.

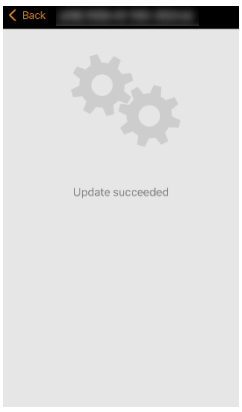
3. After checking for updates, if an update is available a small upward arrow will appear on device icon. Tap on device icon, then select *Update vendor firmware*.



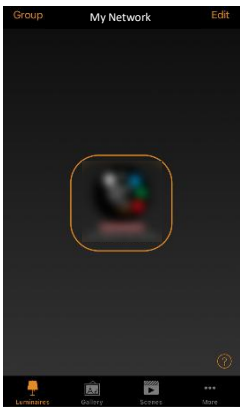
4. Tap *Start Update* on the next page. The transfer of the new Firmware will start.



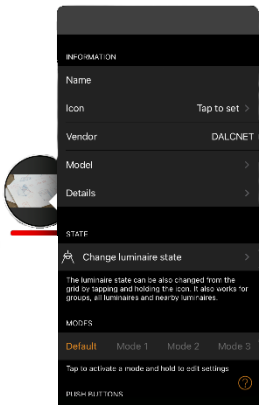
5. Please wait for the update, it may take up to three minutes or so.



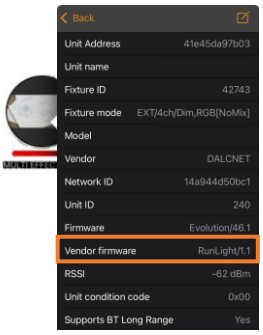
6. After the update and verification are successful, return to *Luminaires* sheet. Previous profile will be loaded.



7. Double tap on the profile icon to show the device configuration settings.



8. Tap on *Details* to show the device info.



9. The firmware version can be viewed under *Vendor Firmware* item.

PROFILES OVERVIEW: FIXTURES

MICRO-1CV-CASAMBI supports the following profiles (selectable by CASAMBI mobile app) that provide different device settings.

PROFILE NAME	PROFILE ID	DESCRIPTION
MICRO-1CV-CASAMBI [1200Hz]	**49072 (Default)**	**1200Hz PWM Dimmer** One slider to dim the output, Linear dimming curve PWM frequency set: 1200 Hz
MICRO-1CV-CASAMBI [600Hz]	49071	**600Hz PWM Dimmer** One slider to dim the output, Linear dimming curve PWM frequency set: 600 Hz
MICRO-1CV-CASAMBI [300Hz]	49073	**300Hz PWM Dimmer** One slider to dim the output, Linear dimming curve PWM frequency set: 300 Hz

Table 7: Profiles list