AIR-BRIDGE-DMX

User Manual

Made in Italy

lumenradio

FEATURES

- LumenRadio wireless DMX transceiver
- Input voltage: typical 230 Vac @50Hz, range (85 ÷ 305) Vac
- Transmit via wireless a full-DMX universe with RDM capabilities
- External linking button
- Concurrent Bluetooth Low Energy features
- Over-the-air software upgrades
- Insulated DMX512 Input/Output
- Device configuration by LumenRadio CRMX Toolbox© mobile application
- Modes of Operation: Receiver (RX), Trasmitter (TX)
- IP67 enclosure with IP67 external SMA antenna
- Dimensions: 90x90x65mm (antenna excluded)
- 100% Functional Test

PRODUCT DESCRIPTION

AIR-BRIDGE-DMX is a Wireless transmitter and receiver powered by LumenRadio module with concurrent Bluetooth that convert DMX protocol (with RDM functionality) to a wireless signal. Concurrent Bluetooth enables easy setup, configuration and lighting control using portable devices through LumenRadio CRMX Toolbox© mobile application.

AIR-BRIDGE-DMX uses wireless signals to rapidly transmit data packets from a transmitter to a receiver (usually near lighting fixtures). Instead of relying on traditional DMX cables, AIR-BRIDGE-DMX streamlines communication wirelessly, reducing setup time and costs for live productions. It's like turning regular, wired DMX into a wireless signal, like how digital wireless microphones work. The data from the controller goes into a DMX connector on the wireless transmitter, and the data moves wirelessly through the air. AIR-BRIDGE-DMX transmitter can be easily paired with other receivers by means of external pushbutton that enable the linking connection between Master transmitter (TX) and Slaves Receivers (RX).

Through the LumenRadio CRMX Toolbox© mobile application it is possible to setup and configure multiple parameters of the AIR-BRIDGE-DMX, such as modes of operation Transmitter (TX) or Receiver (RX).
LumenRadio CRMX Toolbox© 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 the QR Code directly on your device.

PRODUCT CODE

CODE	POWER SUPPLY	REMOTE CONTROL (BUS)	APP CONFIG
AIR-BRIDGE-DMX	85 ÷ 305 Vac @50Hz	LumenRadio wireless DMX512-RDM	LumenRadio CRMX Toolbox©

Table 1: Product code

REFERENCE STANDARDS

STANDARD	TITLE
EN IEC 62368-1:2020+A11:2020	Audio/Video, information and communication technology equipment - Part 1: Safety requirements
ANSI E1.11	Entertainment Technology - USITT DMX512-A - Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories
ANSI E1.20	Entertainment Technology-RDM-Remote Device Management over USITT DMX512 Networks

Table 2: Reference standards

TECHNICAL SPECIFICATIONS

Description		Acronym	Values Min		Values Max	Units of Measure	Note
INPUT (AC IN Power)							
Nominal Supply Voltage		V_{IN}	230			Vac	-
Supply Voltage range		V_{IN-RNG}	85	÷	305	Vac	-
Mains Frequency		F_{MAINS}	50			Hz	-
Efficiency at full load		E_{FF}	> 95			%	-
Standby power absorption		P_{STBY}	< 0.5			W	-
DMX							
No. of DMX Channels		DMX_{SIZE}	0	÷	512	-	-
DMX Frame Rate		DMX_{RATE}	0.8	÷	830	fps	-
RDM support		RDM	Supported (RX mode)			-	
ENVIRONMENTAL							
Emitted Power		TX_{POUT}	5	÷	20	dbm	-
Operating Frequency Range		f_{RANGE}	2402	÷	2480	MHz	-
Storage Temperature		T_{STOCK}	-40	÷	+60	°C	Minimum values defined by design.
Working Ambient temperature		T_A	-20	÷	+60[1]	°C	
Connector Type	Power	C_{PWR}	Screw Terminal			-	Internal
	DMX	C_{DMX}	Screw Terminal			-	Internal
	Cable Gland	C_{GLAND}	IP67 cable glands			-	-
	Antenna	ANT	IP67 Coaxial SMA			-	-
Wiring Section		WS_{SOLID}	0,2	÷	1.5	mm^2	Defined by project
		WS_{STRAND}	24	÷	16	AWG	
Strip length		WS_{STRIP}	9	÷	10	mm	-
Protection class		IP_{CODE}	IP67			-	-
Enclosure Material		M_{CASE}	Plastic			-	-
Packaging unit		UP	2			pc.	-
Mechanical dimensions		- / MD	L: 90	A: 90	P: 65	mm	Antenna excluded.
Packaging dimensions		PD	262	177	81	mm	-

Table 3: Technical specifications

[1] Depends on ventilation conditions

INSTALLATION

WARNING! *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 remote control, the load and the supply voltage. It is recommended to follow these steps to install the product safely:

1. DMX bus wiring: connect the DMX data bus signals "D+", "D-" and "COM" to the internal "DMX" terminal.
2. Mains Voltage wiring: connect the 230 Vac mains voltage to the "N" and "L" terminal of the internal AC IN connector.

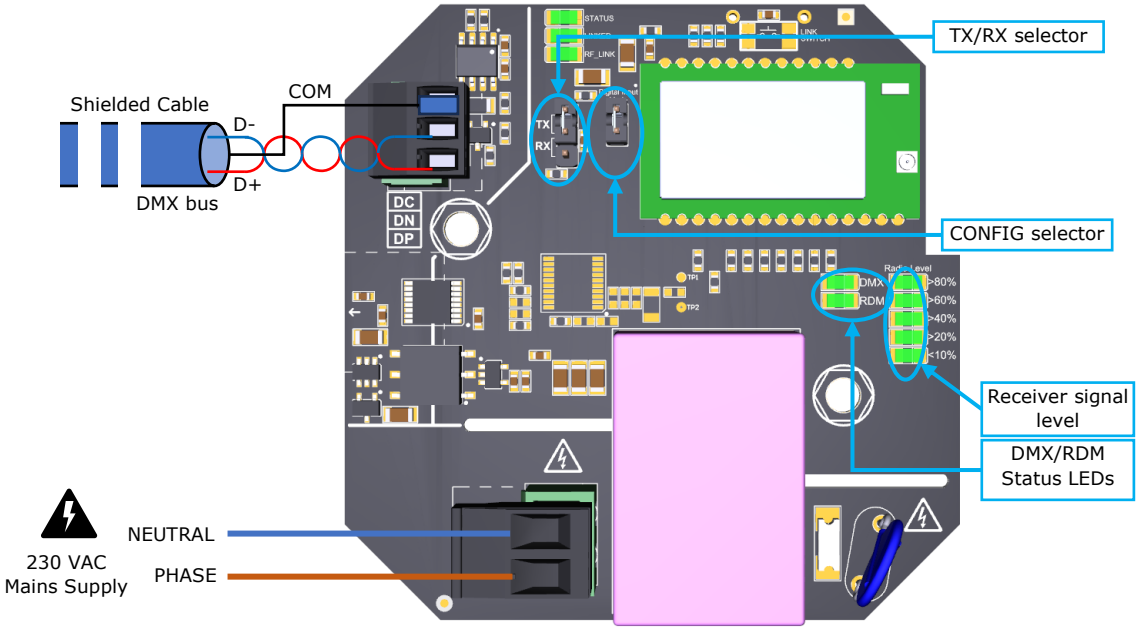

Figure 1: Main AC Voltage and DMX bus connections

DMX BUS WIRING

AIR-BRIDGE-DMX can propagate the wired DMX digital bus (a shielded and twisted two-wire cable) through the air by means of the provided antenna. Each AIR-BRIDGE-DMX can be configured as transmitter (TX) or receiver (RX) manually via the internal jumper selector or remotely via Bluetooth with LumenRadio CRMX Toolbox© mobile application.

To use the remote configuration via Bluetooth, remove the TX/RX and CONFIG jumpers from AIR-BRIDGE-DMX electronic board.

To connect AIR-BRIDGE-DMX to the DMX network, simply connect the DMX data bus signals "D+", "D-" and "COM" to the internal "DMX" terminal (refer to Figure 1). To maintain proper IP (Ingress Protection) rating, ensure the following:

1. *Cable Section: use a cable with the correct cross-sectional area (gauge) suitable for the application.*
2. *Proper Crimping: when connecting the cable to the provided cable gland, ensure it is crimped correctly. Proper crimping ensures a secure and reliable connection, preventing water or dust ingress.*

Remember that maintaining IP protection involves both the choice of materials (such as the cable) and the quality of installation.

The most commonly used connectors are 3-pole and 5-pole XLR, where one pin is the cable shield (ground) and 2 pins are used for DMX signal transmission. In the case of 5-pole XLR, the other 2 pins are reserved for a secondary DMX balanced line[2].

[2] Optional, refer to chapter §4.8 of ANSI E1.11.

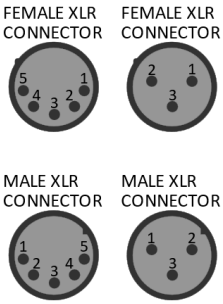

Figure 2: Remote Control connection pin-out and XLR connectors

Signal Description	Pin# (3-Pin XLR)	Pin# (5-Pin XLR)	DMX512 Function
Common Reference	1	1	Data-Link Common
Primary Data-Link	2	2	Data 1-
	3	3	Data 1+
Secondary Data-Link [2]	-	4	Data 2-
	-	5	Data 2+

Table 4: Pin out 3-pin and 5-pin XLR connectors

LumenRadio wireless DMX Topology

Figure 3 shows the connection topology supported by AIR-BRIDGE-DMX through the Wireless technology.

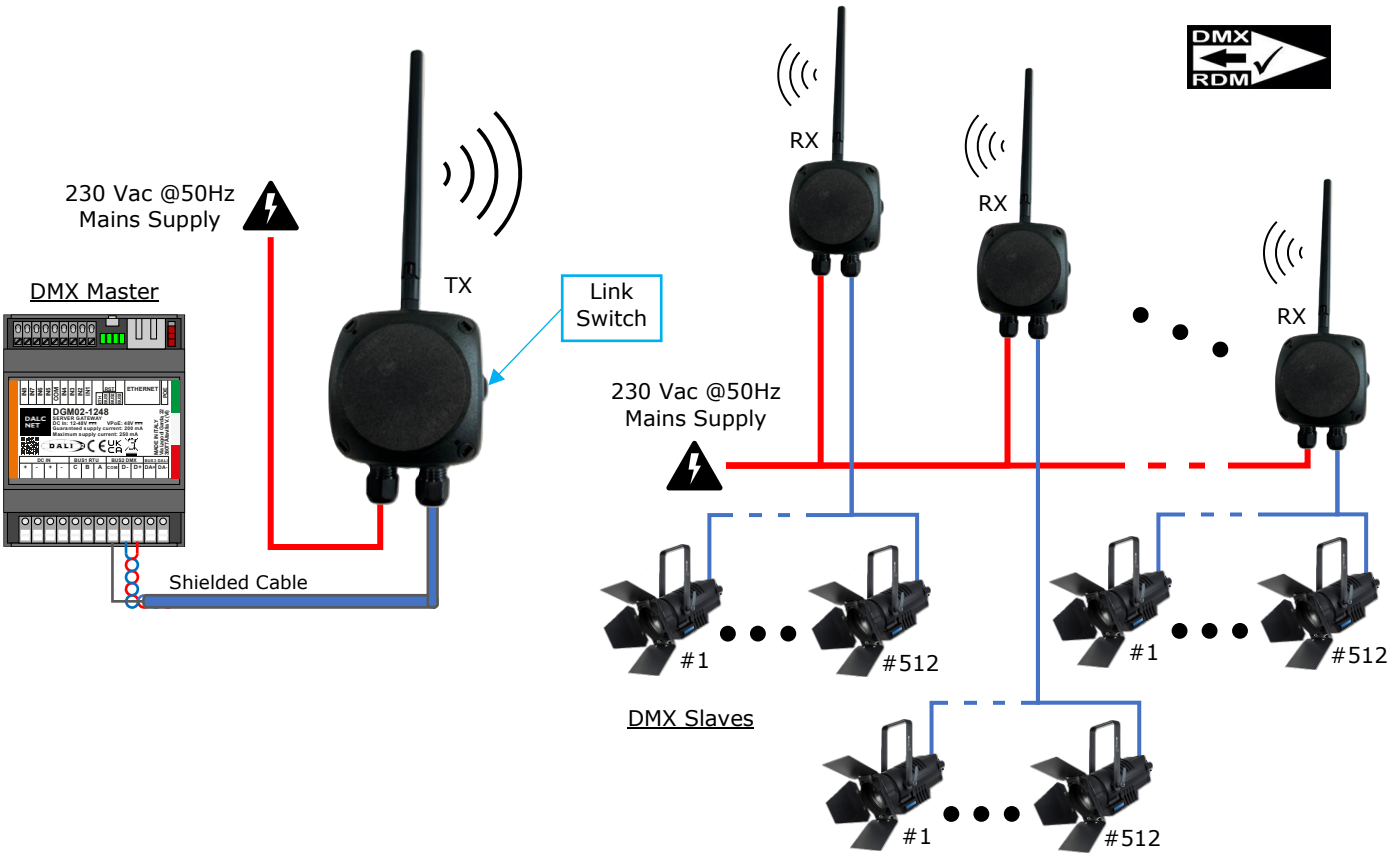

Figure 3: Remote Control Connection Topology

Mains Voltage wiring

AIR-BRIDGE-DMX can be powered by Mains AC Voltage supply at 230 Vac @50Hz. Once the remote control (DMX bus) is connected, connect the power supply to the "N" and "L" terminals of the AC IN terminal (refer to Figure 1).

REMOTE CONTROL: LUMENRADIO WIRELESS DMX512+RDM

The DMX512 protocol (or DMX), is a digital communication standard used primarily for controlling stage lighting in the entertainment industry and allows numerous lights and effects to be controlled from a control room. Recently, it has also been introduced in architectural lighting. The DMX512 is based on the physical RS-485 protocol: an RS485 industrial line, i.e. a shielded bipolar cable with a nominal impedance of 110Ω, is therefore used to connect a DMX512 controller to compatible equipment.
The Remote Device Management (RDM) extension offers a significant improvement by introducing two-way communication between controllers and connected compatible RDM devices. It allows devices to be controlled and communicated in both directions, making it easy to install and configure the devices and enabling intelligent management from the control console through the information sent by the RDM devices. Some of the benefits of RDM include:

1. Remote access to driver address settings from the command console (or DMX controller)
2. Automatic device search: The controller can search the DMX universe for all connected devices and route them automatically
3. Status communication, faults, temperature, etc.: RDM devices can send information about their operating status and any faults to the console

LumenRadio wireless DMX is a technology that replaces traditional DMX cables in lighting systems. A wireless transmitter converts regular wired DMX data into a wireless CRMX signal. The wireless signal is received by a wireless receiver, which then converts it back into regular DMX data. The goal of LumenRadio wireless DMX is to eliminate the need for long, expensive DMX cable runs, saving time and cost for live productions. It ensures seamless transmission within a single event space, preventing signal breaks. AIR-BRIDGE-DMX natively supports the RDM functionality of the DMX protocol also with LumenRadio wireless DMX technology.

TRANSMITTER/RECEIVER SETTINGS

The AIR-BRIDGE-DMX can operate as a transmitter or a receiver. The operative mode can be selected by means the TX/RX internal jumper selection.

WARNING! *Maintenance must always be carried out in the absence of voltage.*
Before proceeding with the TX/RX jumper selection, make sure that the voltage of the power source is disconnected from the system.

The operative mode can be selected in the following two ways:

- Manually: closing the CONFIG jumper and selecting the Trasmitter (TX) or Receiver (RX) operating mode through the onboard TX/RX jumper selector.
- Remotely: removing the TX/RX and CONFIG jumpers from selector pins and using the LumenRadio CRMX Toolbox© mobile application available for Android and iOS.

LINKING PROCEDURE

To be able to transmit data through the system, receivers need to be linked to the appropriate transmitter or repeater.

1. Make sure the receivers are unlinked and that they are withing communication range. If receiver is already linked, follow the steps in the unlink section.
2. Press the link switch momentarily on the transmitter.
3. Wait for the linking process to finish.

Every transmitter can be linked to multiple receivers.

UNLINKING PROCEDURE

Unlinking can be done directly from the transmitter, which will unlink all currently powered receivers that are within range that is linked to this transmitter. This is done by holding the link switch on the transmitter for >3 s.
Unlinking can also be done on one specific receiver by holding pressed its link switch for >3 s.

BLUETOOTH LOW ENERGY

Bluetooth Low Energy (or BLE) is enabled by default. It is recommended to disable the BLE interface after installation has been completed, or to protect the BLE interface by setting a PIN code. To enable or disable the BLE interface, operate to the Link switch performing a rapid double press followed by a long single press (• • ▬).
During the Bluetooth connection to the AIR-BRIDGE-DMX, the CRMX signal strength may be significantly reduced. Therefore, is not recommended to use the Bluetooth configuration app once the CRMX Wireless connection has occurred otherwise the TX/RX device can be disconnected from the Wireless network.

TECHNICAL NOTES

INSTALLATION

WARNING! Installation and maintenance should always be carried out in the absence of AC 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 carried out by qualified personnel in compliance with current regulations.

The product must be installed inside an electrical panel and/or junction box that is protected against overvoltage.

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 control terminals (DMX bus) of the product.

The product must be installed in a vertical or horizontal position, i.e. with the antenna facing upwards or laterally. No other positions are allowed. The bottom position, i.e. with the antenna 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.

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

The device must be powered only with Mains AC power source, short-circuit protection and suitably sized power according to the specifications indicated in the product data sheet. No other types of power supply are permitted.

Connecting to an unsuitable power supply may cause the device to operate 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 wiring or equal to SELV voltage. Use double-insulated cables.

REMOTE CONTROL

The length and type of cables connecting to the buses must comply with the specifications of the respective protocols and current regulations. They must be isolated from any non-SELV wiring or live parts. It is recommended to use double-insulated cables.

WIRELESS WARNINGS

The Bluetooth Low Energy (BLE) connection is performed throught the provided antenna, located on the top of the device.

BLE technology works optimally through non-metallic materials. Therefore, it is not recommended to place the device inside metal boxes or reflective surfaces when using BLE.

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

BLE technology works at a medium distance, generally < 100m. Make sure that the product and your device are close enough to allow communication.

During firmware update and configuration, you should maintain stable contact between your smartphone and the device for the entire duration of the process. This ensures that the update goes smoothly, and that the device is ready to use after the process is complete.

Ensure that the device is positioned in an area with good signal coverage. Avoid obstacles like thick walls or metallic objects that could attenuate the signal.

Avoid placing the device near other electronic equipment or sources of interference (such as microwave ovens or cordless phones). Interference can degrade signal quality.

Periodically check if firmware or software updates are available for the device. Updates often improve stability and security.

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.

SYMBOLS

CE	All products are manufactured in compliance with European Regulations, as reported in the Declaration of Conformity.
	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.