RADICAL WIRELESS

LUMEN CARD

Overview

The LUMEN CARD module enables wireless control of DMX luminaires and LED dimmers through the LumenRadio CRMX protocol. Despite its powerful functionality, the module is extremely compact and can be easily installed in own luminaires or DMX lighting devices.

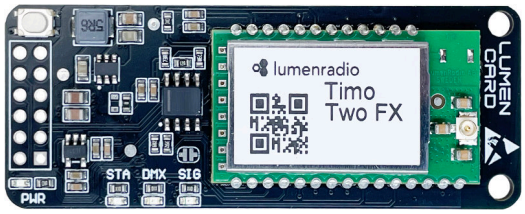
We designed this module with the most flexibilty in mind. The LUMEN CARD provides all on-board features, like LEDs and the mandatory push button for very easy and straight forward usage.
It also features an advanced connectivity to almost all pins of the built-in Lumenradio TiMoTwo module to enable an external user interface as well.

Therefore, you can easily extend your current non-wireless DMX devices with Wireless DMX by integrating this small and versatile module into your hardware or lighting fixture.

The module's small size makes it ideal for applications where space is an issue. Our customers can rely on the LUMEN CARD module to provide a reliable and powerful wireless control solution.

Features

- Supports DMX512-A (ANSI E1.11) and RDM (ANSI E1.20)[1]
- DMX fidelity and frame integrity
- DMX frame rate and frame size auto sensing
- Fixed 5 ms end-to-end latency
- Connectivity based on Bluetooth Smart (BLE), allowing for easy connection from any phone or tablet
- Cognitive coexistence – dynamically avoids occupied 2.4GHz frequencies
- Automatic legacy (W-DMX G3, G4 and G4S) compatibility mode
- Receives CRMX[2], CRMX Classic, W-DMX G3, G4, G4S and G5
- Transmit CRMX Classic, W-DMX G3 or G4S
- U.FL/IPEX external antenna connector
- All configuration data is stored in non-volatile memory, 20 years data retention
- Over-the-air firmware upgrades
- Settings can be changed via the Lumenradio's Toolbox app
- On-board LED interface and switch button - LEDs can be deactivated if the jumper is open
- A standard 2.54mm pitch header for external connection



[1] *RDM support only in RX receiver mode*

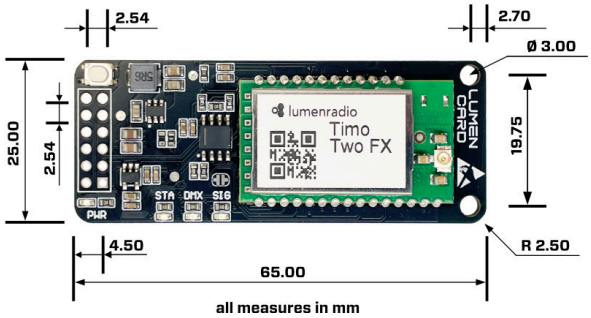
General Functionality

- Power IN — 5 - 36 VDC, max. 300mA
- Temp. working range — -20°C - +60°C
- Frequency — 2402 MHz - 2480 MHz
- Transmitting Power — 5 - 20 dBm
- Wireless Connectivity — Lumenradio CRMX Technology
- Wireless Protocols — DMX/RDM (CRMX, WDMX), Bluetooth
- Antenna connector — U.FL/IPEX socket
- On-board Interface — LEDs: Power ON, STATUS, DMX, LOW-Signal Level
  Button: LINK
- Pin-Connections — Signal Level LEDs, LINK, DMX
- Programming Interface — none
- DMX Support — DMX512-A (ANSI E1.11) and RDM (ANSI E1.20)
- DMX / RDM Data — In Transmitter TX mode
  - Support for DMX512-A (ANSI E1.11)
  In Receiver RX mode
  - supports DMX512-A (ANSI E1.11) and RDM (ANSI E1.20)

Dimensions and User Interface

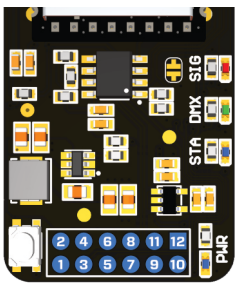
Dimensions

65mm x 25mm x 3mm (w/o cable & antenna)



User Interface

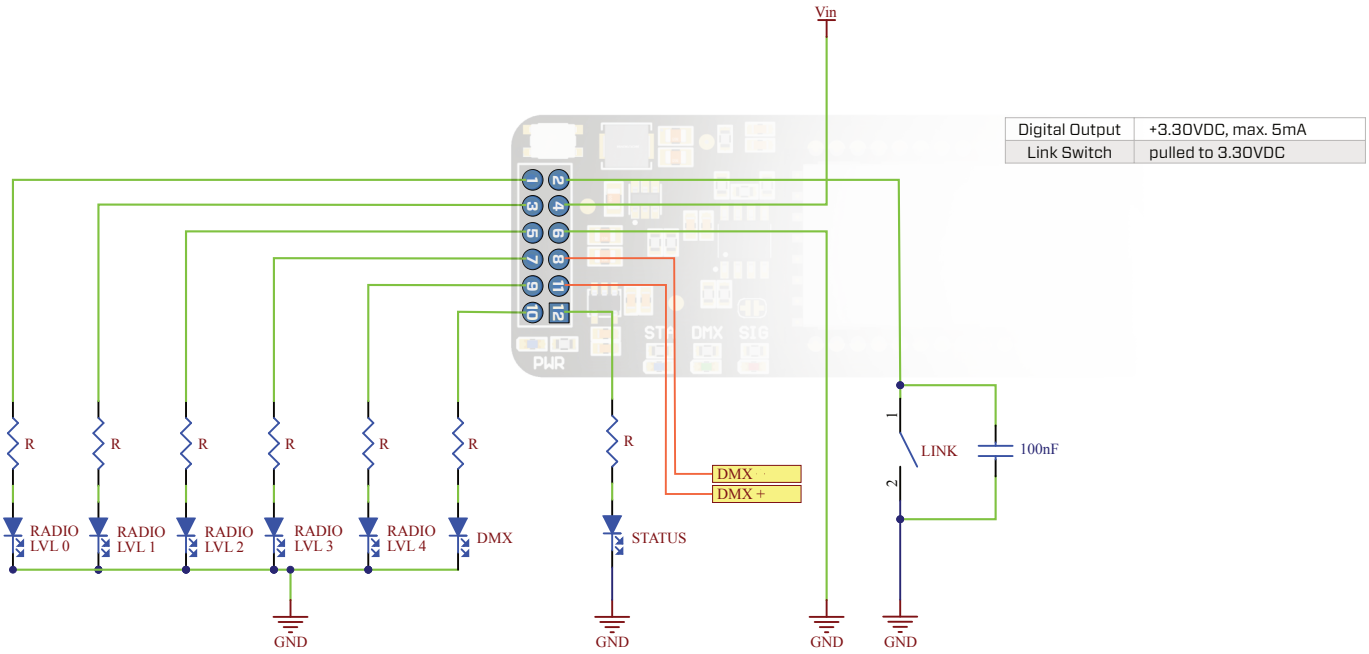
1	Radio LVL 0	< 10%	Digital output
2	LINK Button	Link control switch input	Digital input
3	Radio LVL 1	> 20%	Digital output
4	VDD	Power IN	Power
5	Radio LVL 2	> 40%	Digital output
6	VSS	GND	Power
7	Radio LVL 3	> 60%	Digital output
8	DMX -	RS485 signal	Digital output
9	Radio LVL 4	> 80%	Digital output
10	DMX +	RS485 signal	Digital output
11	DMX LED	Indicates valid DMX	Digital output
12	STATUS LED	Indicates Status Changes	Digital output



SIG	LED Radio Signal Low
DMX	LED DMX Active
STA	LED Status
PWR	LED Power On
Button	Link Button
Solder Pad ⫩	Closed: onboard UI LEDs on Open: onboard UI LEDs off

Technical data for the CRMX module can be found at Lumenradio https://docs.lumenrad.io/timotwo/

Typical Application Circuit



LED Indicators and User Interface

LED Indicators

"PWR"	blue	Power IN
"STA"	blue	indicates different statuses of the unit - see following pages
"DMX"	green	receiving a valid DMX signal
"SIG"	red	CRMX/WDMX signal is below 10% or transmitter is not in reach (off in TX mode)

User Interface

Link Button	for change FX modes or link/unlink procedure

Wireless DMX Interface and Usage

The integration of the latest Lumenradio TiMoTwo wireless hardware this allows you to change setting by use Lumenradio's Toolbox app via Bluetooth. The app is freely available for iOS and Android.

With this app you can change settings, like RX / TX mode change, transmitting power, DMX behavior on signal loss, or easily update your LUMEN CARD to the latest Lumenradio firmware.

There are also Lighting Control apps available which you can control your lights through Bluetooth without the need of having a lighting console.

If you want to change the FX modes without the app, you can simply do this directly by executing a specific sequence by pressing the LINK button on your LUMEN CARD.

1) Press the LINK button 5 times, followed by one long press will enter FX mode selection
2) Now the status LED starts flashing to indicate the currently selected FX mode (see diagrams below for details)
3) Each short press will toggle the currently selected FX mode
4) To save your selection, perform a long press of the LINK button until the LEDs change behavior. This saves the selection and reinitializes the module

Note: If no selection is made within 15 seconds of the last button being pressed, the mode selection is canceled and normal operation continues in the previously selected FX mode.

STATUS LED indication

Indication when changing TX / RX mode:

Flashing fast: Receiver mode selected

Flashing slow: Transmitter mode selected

In Transmitter mode TX:

Transmitter is in standby mode, but is not getting any active valid DMX data

Transmitter receives valid DMX data

Transmitter searchs for available (unlinked) receiver

Transmitter unlinks connected (linked) receiver[1]

In Receiver mode RX:

Receiver is not linked to a known transmitter[2]

Receiver is bound/linked to a transmitter, but not in reach - no active radio signal

[1] This puts the receiver back to unlinked mode. This is very useful if a transmitter needs to be replaced. With the new transmitter, easily perform a search to re-link the previous unlinked receiver
[2] In this state, press LINK on a transmitter to simply connect this unit.

Receiver is linked and connected to a transmitter. Not receiving valid DMX data

Receiver is linked and connected to a transmitter. Receiving valid DMX data

LINK / UNLINK PROCEDURE

In Transmitter mode TX:

Linking

1) Ensure the unit is powered and the antenna is attached
2) On the LUMEN CARD perform a short press on the LINK button
3) The unit will search for any unlinked receiver. The receiver STATUS LED will flash for 10 seconds, normal operation will resume
4) The STATUS LED then lights up constantly when the device has been successfully connected

UnLinking

1) Unlink only one receiver: press and hold the LINK button on the receiver for longer than 3 seconds to unlink. All LEDs will go off
2) Unlink all receivers: On the transmitter, press and hold the link button for longer than 3 seconds to unlink all linked receivers

In Receiver mode RX:

Linking

1) Ensure the unit is powered, the antenna is attached and it is not bound/linked to a transmitter
   All LEDs are off (dmx, signal, status)
2) On the transmitter perform a short press on the LINK button
3) The transmitter will search for any unlinked receiver. The receiver STATUS LED will flash for 10 seconds, normal operation will resume
4) The STATUS LED then lights up constantly when the device has been successfully linked

UnLinking

1) Unlink a receiver from a transmitter: press and hold the LINK button on the receiver for longer than 3 seconds to unlink. All LEDs will go off
2) Unlink all receivers: On the linked transmitter, press and hold the link button for longer than 3 seconds to unlink all linked receiver

Troubleshooting

Approvals & Certificates

CE - Certification of Compliances:

- TiMoTwo FX comply with the European Union (2014/53/EU), ETSI EN 300 328 V2.2.2

- EMC/EMV tested according EN 55022 Class B RE

FCC:

- FCC part 15 modular approval - 15.247 - approval to 100mW

For more information on the TimoTwo FX module, see Lumenradio https://docs.lumenrad.io/timotwo/compliance