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# **CRMX Stardust**

User Manual

LumenRadio AB

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## Safety information

**WARNING / WARNUNG / ATTENTION / ADVERTENCIA /  
VARNING / ADVARSEL / VAROITUS / ADVARSEL**



This product must be earthed.



Das Gerät muss an eine geerdete Steckdose angeschlossen werden.



Cet appareil doit être branché à une prise de terre.



Este aparato se debe conectar a una toma de tierra.



Apparaten skall anslutas till jordat uttag.



Apparatet må tilkoples jordet stikkontakt.



Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.



Apparatets stikprop skal tilsluttes en stikkontakt med jord.

## English

1. Please read these instructions and safety instructions carefully before using this product.
2. Keep these instructions for future reference.
3. Never plug the product into the mains supply while it is still in its packaging. Never cover during use.
4. Only use indoors and in dry spaces, except where otherwise explicitly stated.
5. Verify that the product has not been damaged in transport before you make use of it.
6. Keep the product out of the reach of animals, children and persons who require supervision.
7. This product is intended for professional use only.
8. Always place the product on a stable, solid and flat base or safely secure it.
9. Do not use the product near hot surfaces or objects.
10. The mains cable must be regularly and carefully checked for damage to the cable, the plug and other parts. In the event of damage, the product must not be used until the mains cable has been replaced. If the product needs to be cleaned, the adapter or mains cable must be disconnected from the mains supply.
11. Repairs must only be carried out by a qualified person.
12. Note that the connected voltage and current corresponding to the sticker on the product.
13. Never submerge the product or the mains cable in water or any other liquid, in order to prevent electric shocks, fire, injury and other hazards.
14. Never carry the product by the cables and do not put the cord around sharp edges.

## Deutsch

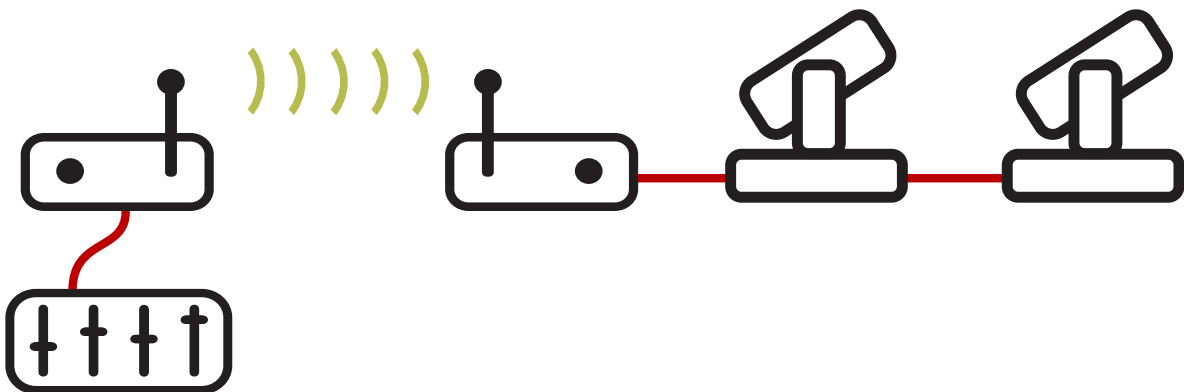
1. Bitte lesen Sie diese Hinweise und Sicherheitshinweise sorgfältig durch, bevor Sie dieses Produkt verwenden.
2. Bewahren Sie diese Anleitung zum späteren Nachschlagen auf.
3. Das Produkt nie anschließen, wenn es sich in der Verpackung befindet- Außerdem darf das Produkt beim betrieb nicht abgedeckt werden.
4. Nur in trockenen Innenräumen verwenden sofern nicht ausdrücklich anders angegeben!
5. Versichern Sie sich vor der Verwendung, das dieses Produkt beim Transport nicht beschädigt wurde.
6. Produkt außerhalb der Reichweite von Kindern, Tieren und zu beaufsichtigenden Personen aufbewahren.
7. Dieses Produkt ist nur für den professionellen Gebrauch bestimmt.
8. Stellen Sie das Produkt immer auf eine stabile, feste und flache Fläche auf.
9. Verwenden Sie das Produkt nicht in der Nähe von warmen Oberflächen oder Objekten.
10. Das Netzkabel muss regelmäßig und sorgfältig auf Schäden am Kabel, Stecker und anderen Teilen kontrolliert werden. Bei einem Schaden darf das Produkt erst wiederverwendet werden, wenn das Netzkabel repariert/ersetzt ist. Wenn das Produkt gereinigt werden soll, muss das Netzkabel vom Stromnetz getrennt werden.
11. Eventuell anfallende Reparaturen müssen von einer qualifizierten Person ausgeführt werden.
12. Beachten Sie, dass die angeschlossene Spannung und Strom dem entsprechen, was auf dem Typenschild angegeben ist.
13. Tauchen Sie das Produkt oder das Anschlusskabel niemals in Wasser oder in andere Flüssigkeiten ein, um einen Stromschlag, Brand, Verletzungen oder andere Gefahren zu vermeiden.
14. Das Produkt nicht am Netzkabel tragen und das Netzkabel nicht um scharfe Kanten legen.

## Introduction

Welcome to the large family of users of LumenRadio's world-leading wireless DMX system. We hope that you will enjoy your brand new devices. We, at LumenRadio, have tailored this wireless DMX system to deliver reliability at its best. No matter if you're using them at a night-club, a community theatre or on the set of a feature film, you should be able to trust its cable-like reliability, but without the hassle of cables.

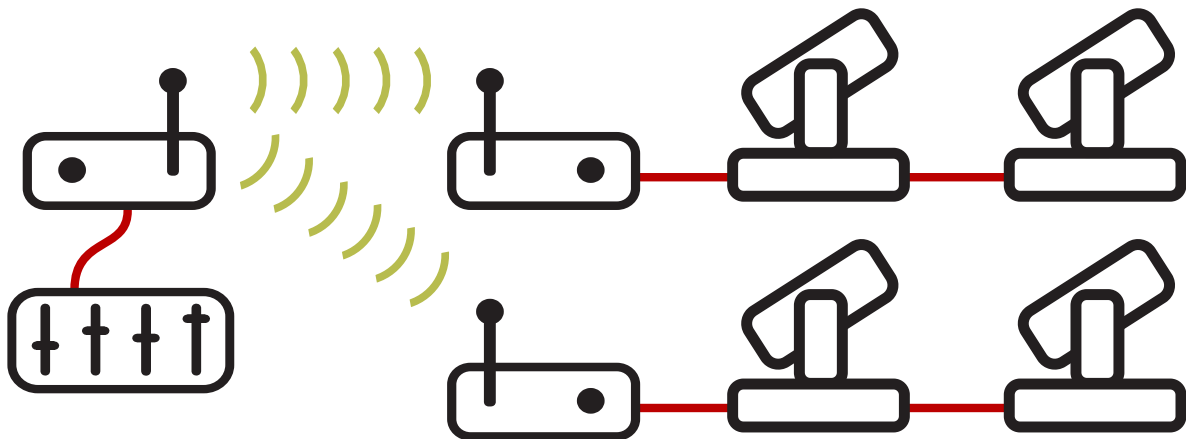
### Wireless DMX in a nutshell

Wireless DMX can be used in many different setups, may it be one single universe being transmitted from one point over a distance to one receiver. This is what is called point-to-point, and is a common scenario when shooting wireless DMX over a distance where cable is not possible. The cable is simply replaced with a wireless cable with a fixed latency of 5 ms.



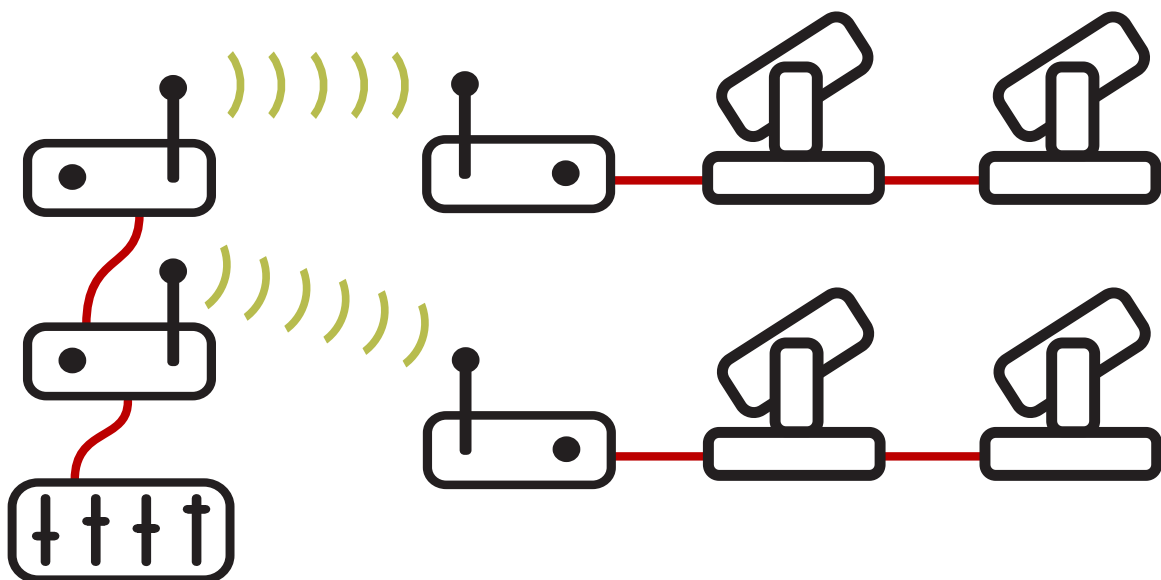
**Figure 1:** One DMX universe in a point-to-point setup

It is simple to just add more receivers to a universe of wireless DMX to create a wireless splitter, where the same DMX data is outputted with a synchronization of less than 0.1 ms. This is what is called a point-to-multipoint setup.



**Figure 2:** One universe in a point-to-multipoint setup

It is possible to have multiple universes being transmitted simultaneously in what's called a multipoint-to-multipoint setup. Simply link each receiver to the transmitted universe you want it to output. The system will automatically exchange encryption keys and other security parameters. The system will coordinate the frequency usage to avoid collisions so that multiple universes can be transmitted simultaneously.



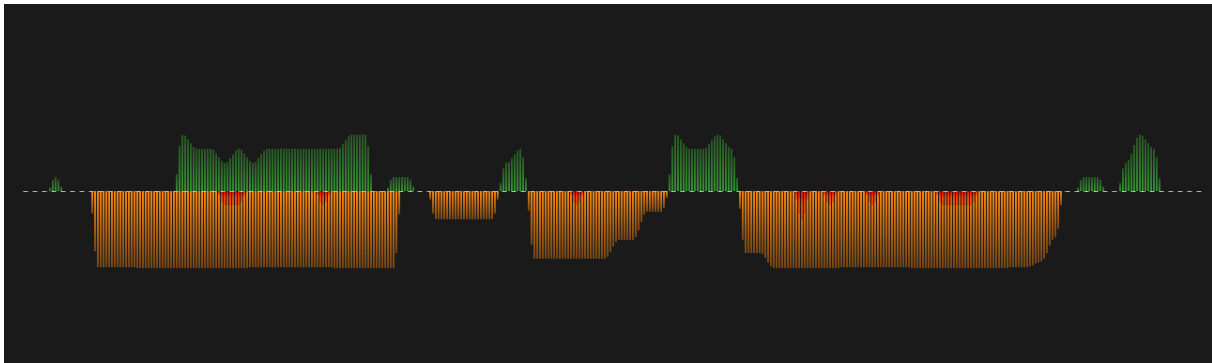
**Figure 3:** Multipoint-to-multipoint setup



## Cognitive coexistence

Cognitive Coexistence is LumenRadio's patented technology for real-time adaptive frequency hopping. It's the foundation of our CRMX<sup>®</sup> technology and the main reason why we are perceived as the most reliable and resilient wireless DMX system on the market.

CRMX systems automatically scan and adapt to the RF environment 1500 times per second. If disturbances are detected, the system will move to frequencies that are currently not disturbed. This is how the cable-like reliability can be achieved, trusted by users in the most demanding sets.



**Figure 4:** Cognitive coexistence

## Compatibility

There has been two major wireless DMX systems on the market for a while - CRMX<sup>®</sup> and W-DMX<sup>™</sup>. They have historically not been fully compatible due to different technologies being used. But CRMX receivers have been able to receive the W-DMX G3 protocol. However, your new CRMX Stardust multi-universe transmitter can be operated in different modes;

1. **CRMX<sup>2</sup>** - transmit 8 universes of CRMX data
2. **CRMX Classic** - transmit 4 universes of CRMX data in compatibility mode.
3. **W-DMX G3** - transmit 4 universes of W-DMX G3 protocol.
4. **W-DMX G4S** - transmit 4 universes of W-DMX G4S protocol.

Stardust can transmit up to 8 universes of wireless DMX data to CRMX receivers. This requires receivers to run the latest firmware that has support for CRMX<sup>2</sup>. Most receivers that are built-in in fixtures manufactured later than circa 2015 can be updated<sup>1</sup>. For receivers that are not upgraded, *CRMX Classic* mode needs to be used.

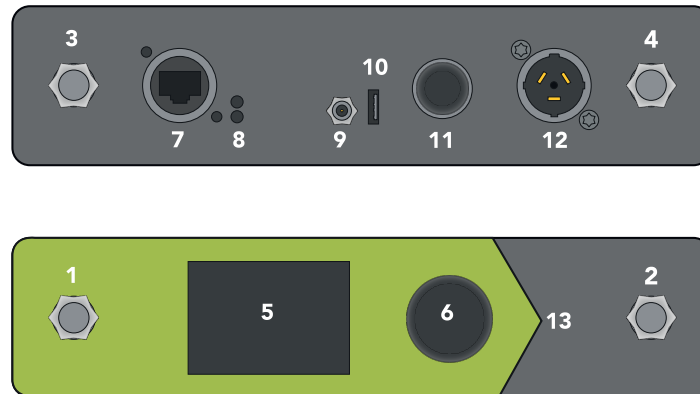
<sup>1</sup>Fixtures using CRMXchip, TiMo RX, TiMo FX or TimoTwo FX can all be upgraded. Contact your fixture's manufacturer for further information. CRMX Nova, CRMX Outdoor and CRMX Slim can not be upgraded.

For W-DMX receivers, please use the W-DMX G3 mode for maximum compatibility. *Note:* This mode can also be used with CRMX receivers, but security and DMX fidelity is not as good as when running CRMX mode.

<b>Mode</b>	<b>CRMX receivers</b>	<b>Older CRMX receivers</b>	<b>W-DMX receivers</b>
<b>CRMX<sup>2</sup></b>	Yes	No	No
<b>CRMX Classic</b>	Yes	Yes	No
<b>W-DMX G3</b>	Yes	Yes	Yes
<b>W-DMX G4S</b>	Yes	No	Yes

## Your Stardust device

### Overview



**Figure 5:** Stardust back and front

1. Antenna for *Output 1* and *Output 2*
2. Antenna for *Output 3* and *Output 4*
3. Antenna for *Output 5* and *Output 6*
4. Antenna for *Output 7* and *Output 8*
5. IPS TFT display for menu system
6. Control knob
7. 1 Gbps Ethernet port (EtherCON)
8. Ethernet Link/Data LEDs
9. DC inlet (10-20V DC)
10. USB port for firmware upgrades
11. WiFi antenna
12. AC inlet (90-240 VAC) (PowerCON TRUE1)
13. Decorative lights

### Mounting

Your Stardust is designed to be able to be mounted in a number of different ways;

1. Truss mounted - using a clamp with either M10 or 3/8" thread.
2. Rack mounted - using the rack mounting kit accessory.
3. Tripod mounted - using a M10 or 3/8" spigot or the yoke accessory.

4. Wall mounted - using the wall mount kit accessory.

### **M10 and 3/8" holes**

On either side of your Stardust unit you'll find holes for M10 (1.5 mm pitch) and 3/8" (UNC). These can be used with any standard truss mounting clamps or spigots, for instance a standard TV spigot.

### **Rack mounting**

You can use the rack mounting kit (sold separately) to mount a Stardust in a standard 19 inch rack.

The rack mounting kit comes with convenient antenna patch cables to bring the rear antennas to the front of the rack.

To mount the rack brackets, loosen four (4) of the M4 screws on each side of the unit, place the rack bracket, and fasten it in place using the M4 screws. Tighten firmly.

### **Wall mounting**

Stardust can be mounted to a wall using the wall mounting kit (sold separately). Loosen the lower two M4 screws on each side of the unit, place the brackets and fasten them using the M4 screws. Tighten firmly.

## Settings and operation

### Firmware upgrades

You can expect firmware updates to be released on a regular basis for your new Stardust unit. Even though we take pride in quality, we probably have overlooked something. Also, there will be many more features added to the firmware in the new weeks and months.

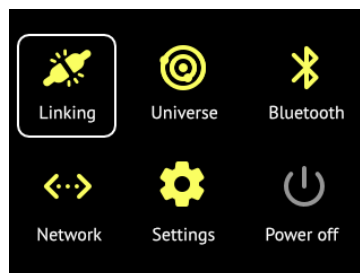
### How to update

1. Go to <https://lumenradio.com/products/stardust/> to download the latest firmware release.
2. Unzip the release and copy the *.img* file to the root directory of a USB stick.
3. Plug the USB stick into the USB port in the back of the Stardust unit.
4. Choose *Update* in the menu on the front panel. (You'll find it under the *Settings* menu.)
5. Stardust will inform you about the process and reboot automatically when done.

**Note:** In the future, upgrades will be possible in less manual fashions.

### Main menu

The operation of Stardust can be performed from the front panel menu system. Linking, mapping of universes, IP settings, etc is all done from here.

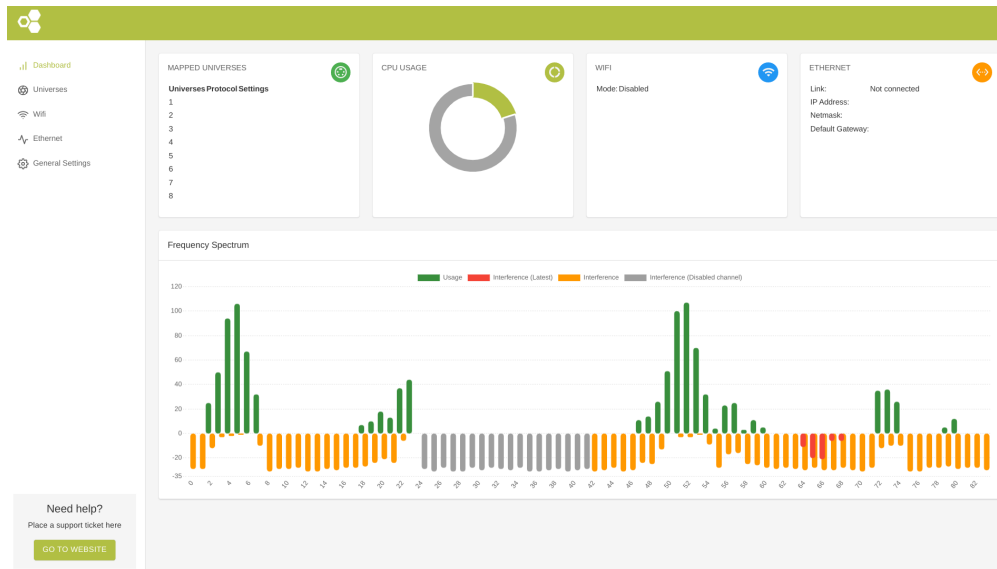


**Figure 6:** Stardust main menu

### Web UI

Most settings and functions can also be operated from the web UI embedded in the device. To access the web UI, take a browser and go to <http://a.b.c.d> where *a.b.c.d* is the IP address of your device.

If you only have one Stardust connected to your network, you can navigate to <http://stardust.local> instead.



**Figure 7:** Stardust Web UI

## Linking

Linking and unlinking receivers is done from the *Linking* menu or from the web UI. Each output can be linked/unlinked individually.

## Universe mapping

In the Universe menu, you can connect each Stardust output to an Ethernet universe, or alternatively disconnect it.

When Stardust is running in a 4 universe mode, every second output will be disabled, hence it's not possible to connect them to any universe at that point.

## Ethernet

Stardust has a built-in Gigabit Ethernet interface. It can be configured for static IP, or to obtain IP automatically from a DHCP server.

## Static IP

When configuring for static IP, you need to configure the following:

- **IP**
- **Netmask**
- **Gateway** (*can be left empty if not connecting to outside networks*)

## **DHCP**

By enabling DHCP your Stardust will obtain IP settings automatically if there is DHCP server available on the network.

## **WiFi**

The built-in WiFi can operate in either Access Point mode, or Client mode.

### **Access Point (AP mode)**

In access point mode Stardust will create a WiFi network that your phone, tablet, etc could connect to. This is handy for instance for iPad based lighting control apps, that can send data to Stardust directly over WiFi.

In AP mode you need to do the following settings:

- **SSID** (*the name of the network*)
- **Password**
- **IP settings**
- **DHCP** (*if the DHCP server shall be enabled or not*)

### **Client mode**

In client mode, the Stardust tries to connect to the specified WiFi network.

- **SSID** (*the name of the network to join*)
- **Password**
- **IP settings** (*static or DHCP*)

## **Battery backup**

Stardust comes with a built-in battery backup for uninterrupted operation. When fully charged, the unit can operate under full load for up to 30 minutes.

**Turning the device off**

When external power is plugged in, the unit will always be on. When operating from the built-in battery, the unit can be turned off by selecting the *Power off* option in the main menu.

**Charging the Battery**

The battery will automatically charge whenever external power is connected to the device.

If the battery is completely depleted it takes approx two hours for it to fully charge.



## **Compliance information**

### **CE**

This product complies with the Essential Requirements of RED (Radio Equipment Directive) of the European Union (2014/53/EU). This product meets the requirements of relevant conformance standards.

A detailed Declaration of Conformity is available upon request from the manufacturer.

### **UKCA**

This product complies with the relevant statutory requirements in the United Kingdom. This product meets the requirements of relevant conformance standards.

A detailed Declaration of Conformity is available for market surveillance upon request from the manufacturer.

### **FCC**

#### **FCC IDENTIFIERS: XRSTIMOMWAN301, 2ABCB-RPIRMO**

#### **FCC Information to User**

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals.

#### **FCC Guidelines for Human Exposure**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

#### **FCC Declaration of Conformity**

We LumenRadio AB, Svangatan 2B, 416 68 Gothenburg, Sweden, declare under our sole responsibility that this product complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

### **FCC Radio Frequency Interference Warnings & Instructions**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an electrical outlet on a circuit different from that which the radio receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Modifications made to the product, unless expressly approved by LumenRadio AB, could void the user's right to operate the equipment.

### **Industry Canada**

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

## Accessories

All accessories can be ordered from your local CRMX distributor.

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<b>Order code</b>	<b>Description</b>
800-2204	Stardust Rack Mounting Kit
800-2206	TNG Wall Mounting Kit
800-2208	TNG V-mount Battery mount

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