RC4 WIRELESS

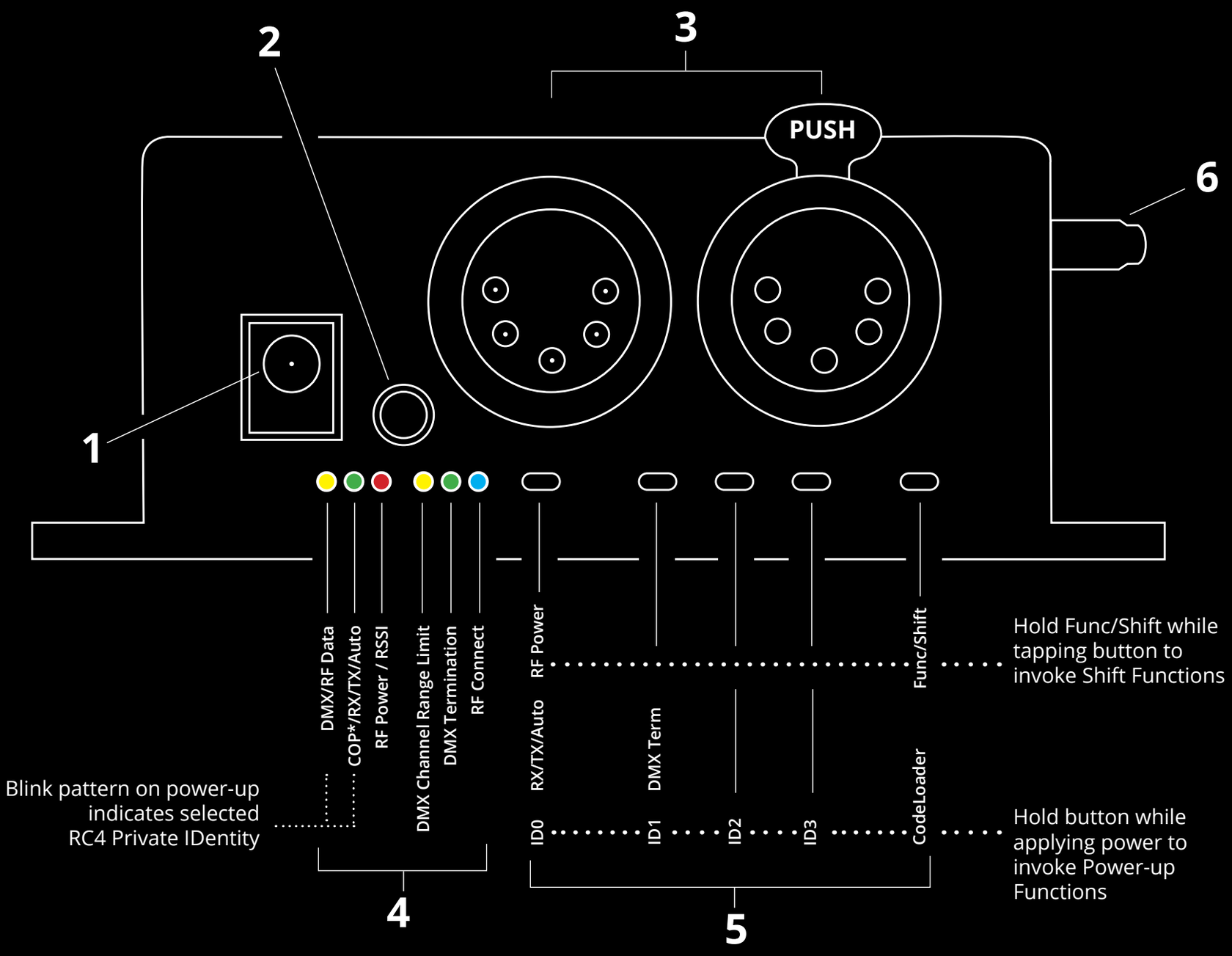
RC4Magic Series 3

DMXio

Wireless DMX Transceiver

Quick Start Guide

Rev. 1.0



* COP means "Computer Operating Properly." This indicator always shows a blink pattern, proving that internal firmware is running. Different patterns indicate different modes of operation.

1. Power Input for AC Adaptor (included)
2. RC4 Miniplug Port
3. DMX In/Out Male and Female 5-pin XLR Connections
4. LED Indicators
5. Recessed Buttons
6. RP-SMA Antenna Connector (2.4GHz DMXio-HG + 900MHz DMXio-HG)

DMXio Quick Start Guide

Most RC4Magic DMXio users will find all the information they need right here. Your DMXio also has some advanced features. You can find out more about them in the RC4 Knowledge Base at *http://rc4.info*.

RC4Magic devices arrive ready to use. You probably do not need to change any settings. Just add DMX!

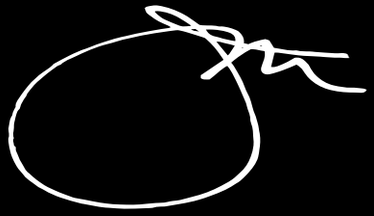
Registering Your Product

Registration ensures you'll be notified of new firmware updates, and warranty claims can be resolved more quickly. Please complete your registration at: *www.rc4wireless.com/support/register/*

Get in Touch

North Carolina, USA: 1-866-258-4577 or 1-919-229-9950
London, UK: +44 (0)20 3289 8765
Email: *support@rc4wireless.com*
Website: *www.rc4wireless.com*

We're here to help!



James David Smith
President and Chief Product Designer
RC4 Wireless

DMXio System Components

To use your DMXio wireless transceiver you will need:

- A DMX lighting console or other source of DMX data.
- An AC power source for the supplied AC power adaptor.
- Another RC4Magic Series 2 or Series 3 transceiver or dimmer to receive the RC4Magic wireless signal you transmit, or to transmit a signal you will receive with this device. (The DMXio can be either a transmitter or a receiver, which is why it is called a transceiver.)

RC4Magic Private IDentities™

RC4 Private IDentities™, unique to RC4Magic wireless DMX systems, keep your data private and safe on a Virtual Private Network (VPN) separate from other systems, with robust resistance to signal loss and slow down.

Each Private ID transports a separate DMX universe. Multiple systems can operate at the same time for multiple wireless universes in the same space.

Each new RC4Magic customer and project is assigned a unique set of Private ID codes — nobody else has your IDs. They are marked on each device. Please note your private IDs below. When you add devices to your system, you must verify your IDs at time of purchase:

ID0 _____ ID1 _____ ID2 _____

ID3, code 999, is the RC4 Public ID. It is identical in all RC4Magic Series 2 and Series 3 devices ever made. Always use one of your private IDs when possible.

Your Private ID0, the factory default, is ideal for most users.

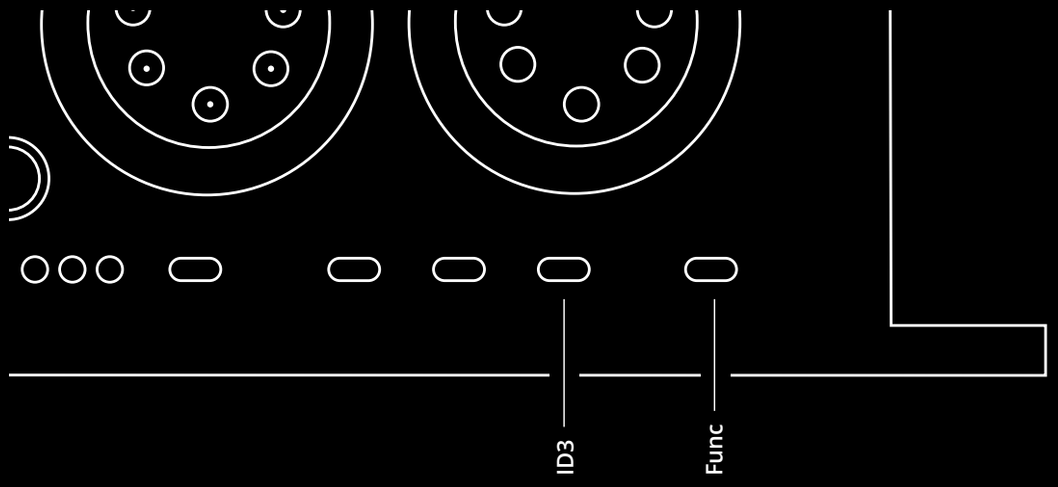
Performing a Factory Reset

If someone else has used your DMXio, or you just want to get back to a known configuration, performing a factory reset is easy:

Power on the device. Wait until start-up is complete and the green COP indicator is blinking continuously.

Press and hold the Func/Shift button, briefly tap (press and release) the ID3 button (right beside the Func button), then release Func/Shift. The first two indicators will blink together a few times to confirm that factory settings are restored.

NOTE: This process restores your RC4 Private IDentity™ to ID0. It does not change the Unit Number if one has been assigned. Learn more about IDs on the next page. Learn more about Unit Numbers when using RC4 Commander configuration software.



PRO TIP:
Bending a single paper clip into a U shape will enable you to easily reach and press both buttons together.

Confirming and Setting an RC4 System ID

All RC4Magic devices being used together must be set to the same RC4 System ID.

On power-up, the currently selected System ID is indicated with a blink pattern on the DMX Data and COP indicators. The four different patterns are noted below.

The factory default ID0 is indicated with a few rapid blinks of the yellow DMX Data LED on power-up. A factory reset will restore this ID setting.

An ID can be selected by holding one button on power-up. The blink pattern for the newly selected ID will appear on the indicators. You can also confirm the currently selected ID at any time by cycling power and watching the blink pattern that appears at start-up with no buttons pressed.

To select an ID, press and hold the associated button, apply power, and release the button when the blink pattern appears. For example, to select ID1, hold the ID1 button and apply power. When you see the green LED blink rapidly, release the button.

All RC4Magic Series 3 devices indicate IDs in the same way, making it easy to quickly confirm that all devices in your system are set correctly to work together.

ID0 (default), yellow blink. Hold the ID0 button on power-up to select.

ID1, green blink. Hold ID1 on power-up to select.

ID2, yellow and green blink together.

ID3 (public), yellow and green alternate.
Note: ID3 is public and is less secure than Private IDs.

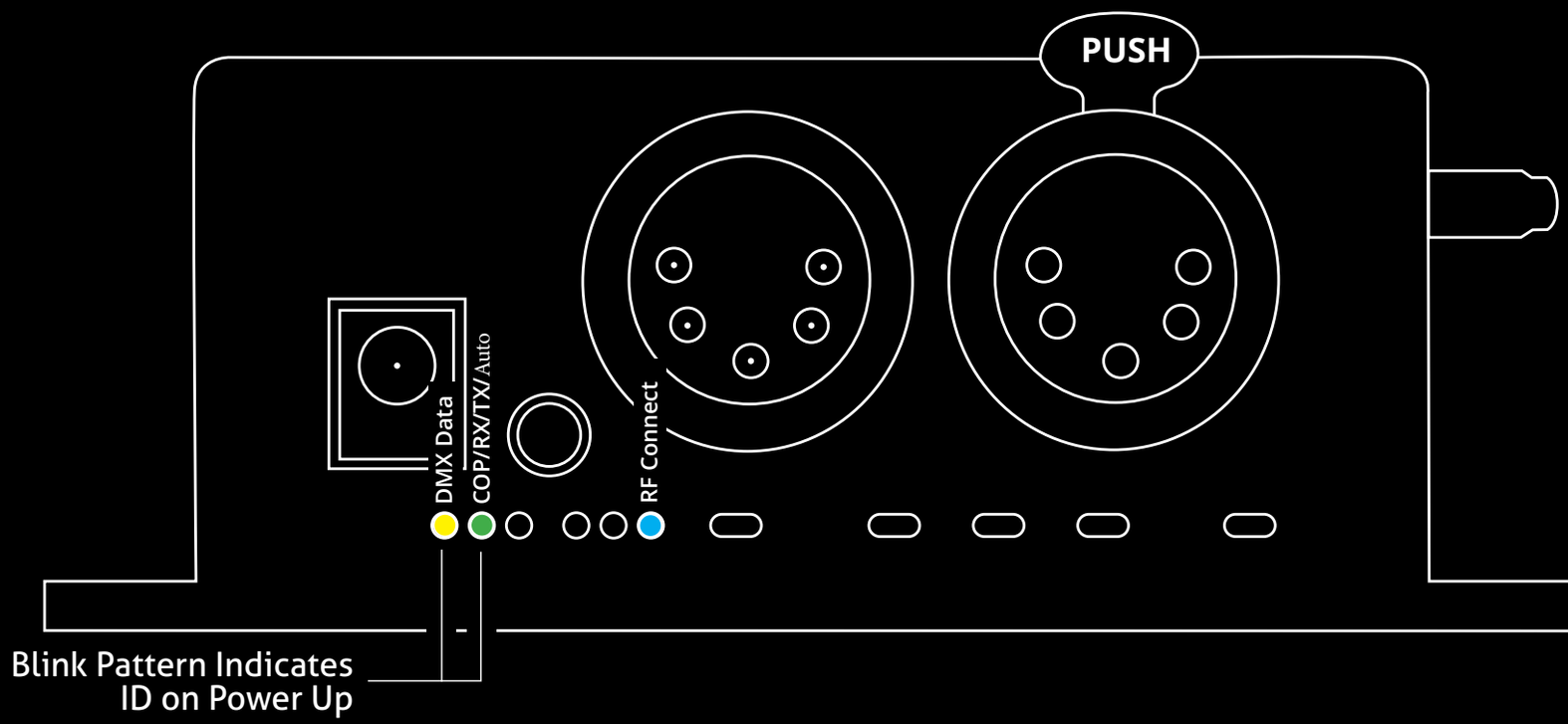
Connecting with other RC4Magic Devices

All RC4Magic devices **configured on the same RC4 Private IDentity™** will automatically connect and form a VPN (Virtual Private Network). Confirm that each device in your system is labeled with the same RC4 Private IDentity™ codes, and that each device indicates the same System ID selection on power up (see page 7). The default is ID0, which is ideal for most users.

When first powered up, or after a transmitter has gone off and then comes back online, **receivers can take up to 10 seconds to join the VPN**. This is normal, and it is usually much less than 10 seconds.

A DMXio transceiver in Auto Mode (the default setting) will automatically detect wired DMX data from your console and establish itself as the system transmitter.

RC4Magic devices from a different system will not work with your RC4 Private IDs. This is the key to RC4Magic data security and superior performance for all users.



RC4Magic Indicator LEDs After Power-Up

The **COP** indicator blinks with different patterns to indicate various device modes. The **DMX Data** LED indicates that DMX data is present, either from a connected DMX controller, or from the VPN wireless link. If the yellow indicator is not active, no DMX data is present.

Yellow blinks with data packets and may appear irregular:

DMX Data: 

On DMXio transceivers operating in transmitter mode, the RF Connect LED blinks slowly to indicate that a wireless VPN has been formed and the DMXio is the master transmitter:

Green long blinks indicate transmitter mode:

DMXio, Transmit Mode COP Pattern: 

RF Connect: 

RC4Magic Series 3 (2.4GHz) Receivers

If your DMXio has a purple and black label, it is part of an **RC4Magic Series 3 system operating in the 2.4GHz band**. The RF Connect indicator remains on (not blinking) while the DMXio is searching for your VPN. It blinks quickly and continuously while your DMXio is connected to your wireless VPN.

DMXio RF Connect, Searching: 

Connected: 

RC4Magic-900 (900MHz) Receivers

If your DMXio has a blue and black label, it is part of an **RC4Magic-900 system operating in the 900MHz band**. The RF Connect indicator is always blinking, and indicates only that the RF system is functional, not whether or not it has joined a VPN. Use the DMX Data indicator to confirm that streaming DMX is present.

DMX Data Received Wirelessly: 

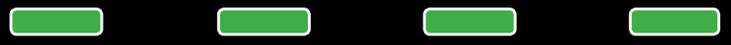
DMXio Auto Mode - Automatic Transmit or Receive Selection

RC4Magic devices from a different system will not work with your RC4 Private IDs. This is the key to RC4Magic data security and superior performance for all users.

A DMXio transceiver in Auto Mode (the default setting) will automatically determine if it should transmit or receive. To do this, it detects whether or not wireless DMX is already present on the air for the selected System ID, and whether or not DMX data from a controller is present at the XLR connectors.

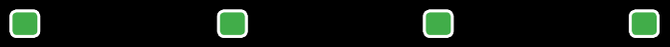
The device starts in Auto mode, with the green COP blinking a 50% duty cycle:

Auto mode, application detection:



The DMXio first scans all available RF channels for the presence of data from another transmitter on the same RC4 Private IDentity. **If it finds valid RF data, it automatically sets itself as a wireless receiver:**

Green short blinks indicate receiver mode:



If no valid RF signal is found, the DMXio checks for DMX data coming in from a controller connected to the 5-pin XLR connectors. **If valid DMX data is found, it automatically sets itself as a wireless transmitter:**

Green long blinks indicate transmitter mode:

If neither RF nor DMX data are found, the DMXio stays in Auto mode, waiting for one of the two conditions to be met. Thus, if it is connected to a DMX console, transmitter mode will be invoked when the console is turned on and it starts generating data.

Manual Selection of Transmit or Receive Mode

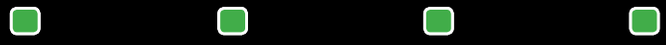
Auto mode is the recommended setting and the default. It is a reliable context-sensitive system that ensures all your DMXio devices are always doing what you need them to do, even when you swap them around in the dark.

If you prefer to force a mode, you can. Using a small screwdriver or bent paperclip, press the recessed button for **RX/TX/Auto**. Each time you press the button, the mode toggles to the next available setting. When an option other than Auto is selected, the DMXio will indicate the current mode with the green LED, without doing any scanning first.

If the DMXio is forced to function as a transmitter, it will power up and show the transmitter mode COP indicator pattern:

Green long blinks indicate TX (transmitter) mode: 

If the DMXio is forced to function as a receiver, it will power up and show the receiver mode COP indicator pattern:

Green short blinks indicate RX (receiver) mode: 

CAUTION: ***RC4Magic wireless networks support only a single transmitter per System ID.*** If you configure more than one DMXio to operate as a transmitter at the same time on the same ID, the system may not perform as expected. This is why it is best to *not* force transmitter mode. In Auto mode, the DMXio will confirm there is no other transmitter already operating before it will enable itself as a transmitter.

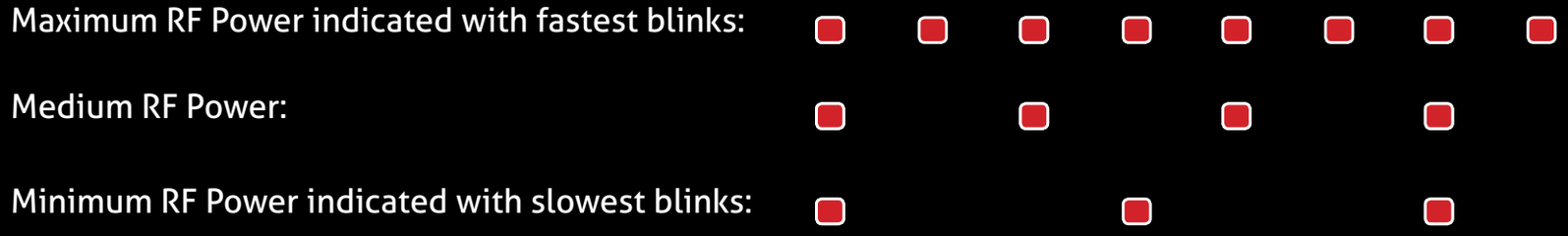
RF Transmit Power

In transmit mode, the RC4Magic DMXio can operate over a range of RF power levels. The default is the maximum power, and this is often appropriate for real-world applications where numerous other wireless devices and systems compete for bandwidth and priority.

It is best practice, however, to use the lowest power level that is satisfactory for your specific application and environment. A lower transmit power reduces the overall RF noise floor and can be helpful for all the wireless systems in the same facility or project. The same applies for all those other systems as well; when possible, it is best to operate *all* wireless systems at the lowest transmit power that yeilds acceptable performance.

On the DMXio, RF power is a **Func/Shift** function. That means that the **Func/Shift** button must be held while tapping the **RF Power** button to change the power level.

RF power is indicated with a blinking red LED, marked **RF Power/RSSI**. It is the third indicator from the left, after the yellow and green indicators. Three RF levels can be selected with the buttons. Faster blinking indicates high power:



With the Func/Shift button pressed, each tap of the RF Power button will increment to the next RF power level. After the highest level is selected, the next option is the lowest, and so on. (This is the same button used to select **ID0** on power-up, and to select **Auto/RX/TX** modes when not holding the **Func** button.)

DMX Channel Range Limit

It is possible to limit the range of DMX channels being transmitted over the RC4Magic wireless VPN network. To accommodate this, two hidden parameters within the device allow setting the lowest and highest channels to be transmitted. *Accessing these parameters can be done only with RC4 Commander configuration software.*

When these parameters are set to other than 1 (lowest) or 512 (highest), the yellow indicator marked **DMX Channel Range Limit,** fourth from the left, will illuminate as a warning that some DMX channels are not being transmitted.

DMX Channel Range Limit
- ON means channel range is limited, not all channels are transmitted
- OFF means all channels are being transmitted

Without RC4 Commander software, you can cancel channel range limiting by doing a factory reset (page 6).

DMX Line Termination

The RC4Magic DMXio has a selectable internal DMX/RDM line terminator. This terminator should be activated when the DMXio is at the end of a DMX cable run. Do not enable the terminator if DMX data is passing through to additional devices down the line. The green indicator, fifth from the left, indicates the status of the DMXio internal line terminator:

DMX Termination
- ON means DMX/RDM end-of-line termination is engaged
- OFF means no termination is enabled within the DMXio

Tap the **DMX Term** button to toggle the state of the internal terminator.
(This is not a Func/Shift function. A single button-press controls this feature.)

2.4GHz DMXio-HG : The "High Gain" Option

The 2.4GHz DMXio is available in two versions, one with an internal antenna, and the other with an RP-SMA antenna connector with an external whip antenna. The latter version is the **DMXio-HG**. The 900MHz DMXio-HG is standard; there is no internal antenna version.

The "HG" means "High Gain" because it can be used with high-gain antennas. Note, however, that the standard antenna provided with the DMXio-HG provides the same gain as the regular DMXio with an internal antenna.

The DMXio-HG provides additional flexibility for applications where specialty antennas are helpful. It is impossible to outline all the different types and sizes of antennas in this quick-start guide, but examples include:

- **High-gain dipole antennas** deliver more signal horizontally by reducing RF radiation vertically (above and below). The higher the gain in dBi, the flatter the signal profile. It is sometimes helpful to use 7dBi or 9dBi antennas with the DMXio-HG.
- **Directional panel antennas** focus RF energy in a particular direction with a spread usually specified in degrees. Antennas with 120-degree and 180-degree profiles are helpful for sending more signal towards a stage or performance area, by not sending energy behind the panel.
- **Yagi antennas concentrate RF energy in a highly focused beam.** When aimed properly, they enable for long distance radio links. Their disadvantage is susceptibility to mis-alignment. In most cases, Yagi antennas are not needed for wireless DMX applications, but they are sometimes used to send signals around large buildings, or across wide open areas.

Advanced Features

The DMXio is a multifaceted device for users of all experience levels. The features below can be explored further at *http://rc4.info/* or by asking us for help at *support@rc4wireless.com*:

- RC4 Commmander software, available for Mac OSX and Windows, provides a rich user interface for configuring multiple RC4Magic devices remotely.
- The DMXio can be optionally powered by DC voltage on XLR connector pins 4 and 5. This requires opening the device and soldering jumpers across two clearly marked pairs of solder pairs. The DC input voltage range is identical to all other RC4Magic devices: 5V - 35VDC. Learn more about this option at *http://rc4.info/* or by asking us for help at *support@rc4wireless.com.*
- The DMXio does not support wireless RDM transmission and reception.
- RC4Magic devices do support wired RDM, making it easy to configure dimmers and other devices using an RDM controller plugged into the miniplug port. An XLR-to-miniplug adaptor facilitates this connection.

Caring for Your DMXio

- The DMXio should be powered by the AC adaptor provided, or an equivalent adaptor, power supply or battery delivering voltage between **5VDC and 35VDC**. The voltage does not need to be perfectly regulated but it must remain within the specified range. At 9V, the power supply should be able to deliver at least 300mA of current.

- **Do not connect AC line voltage directly to the DMXio.** Doing so will severely damage the device and is extremely dangerous for the operator.

- The DMXio should be kept away from excessive heat, cold, dust and moisture. An IP-65 enclosure kit is available from RC4 Wireless for use in outdoor installations.

- Do not immerse in water or other fluids.

- Allow space for air to move around the unit for cooling, especially in very hot environments.

Failing to observe appropriate safety precautions can result in fire or other risk, and usually voids the RC4Magic warranty. RC4 Wireless cannot be held responsible or liable in such cases. Operate the DMXio at your own risk.