

CITY THEATRICAL

NEW YORK • LONDON

Multiverse[®] Transmitter P/N 5910

User's Manual Rev 1.3

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Multiverse Transmitters are covered by U.S. Patents #7,432,803 B2, #10,129,964 B1, and other patents pending.

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Made in USA

US HEADQUARTERS
475 BARELL AVENUE
CARLSTADT, NEW JERSEY 07072
TEL 800 230 9497 / 201 549 1160
FAX 201 549 1161

www.citytheatrical.com

LONDON OFFICE
UNIT 1-3 WYVERN ESTATE, BEVERLEY WAY
NEW MALDEN, SURREY KT3 4PH
TEL +44 (0) 20 8949 5051
FAX +44 (0) 20 7183 6061

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Compliance

FCC Compliance Statement (United States)

This device complies with Part 15 of the Federal Communications Commission (FCC) Rules.

Operation is subject to the following two conditions:

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

CAUTION: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IC Statement

This device complies with Industry Canada's license-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. l'appareil ne doit pas produire de brouillage, et
2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Safety Notices

Please read this entire manual before using your new equipment. Please keep the manual in a safe place so you can refer to it in the future as required.

The Multiverse wireless DMX/RDM System is intended for use only by qualified professionals. Connection, installation, and hanging of this equipment must be performed in accordance with all pertinent local, regional, and national safety codes and regulations.

Multiverse wireless DMX/RDM equipment is intended for indoor use only unless specified for outdoor use. Keep the equipment dry! Do not operate the equipment if it gets wet!

Do not operate in excessive heat/direct sunlight. Be sure installation provides adequate ventilation. There are no user-serviceable parts inside! Refer to qualified service personnel!

RF Exposure: The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.

Introduction

City Theatrical's 5910 Multiverse® Transmitter opens a new world in wireless DMX/RDM. Its Ethernet input allows it to take in streaming ACN (sACN) or Art-Net and to transmit as many as nine user selectable universes of DMX/RDM (five in the 2.4GHZ band and four in the 900MHz band) while using only a fraction of the radio energy of any present day single universe wireless DMX transmitter.

The Multiverse Transmitter has a Bluetooth radio receiver built in that allows it to communicate with City Theatrical's multi award winning DMXcat® app from the user's smartphone. This gives the user smartphone control of any lighting fixture that is part of the Multiverse setup, whether it is a lighting fixture with a Multiverse Module inside, a lighting fixture receiving its data from a Multiverse Node, or any wired fixture downstream of those devices.

The Multiverse Transmitter is Wi-Fi enabled, allowing for communication and control from tablet-based Wi-Fi lighting controllers like Luminair.

5910 Multiverse Transmitter Overview of Features

- **More DMX Data, Less Radio Energy**
Broadcast up to nine universes of DMX data while using less radio energy than other single universe wireless DMX transmitters.
- **Simultaneous Dual Band Transmission**
Broadcast on the 2.4GHz band and the 900MHz band at the same time.
- **mDMX**
mDMX is a form of DMX optimized for wireless broadcast that dramatically reduces data being broadcast, thereby reducing unneeded radio energy.
- **mRDM**
Multiverse is able to broadcast RDM information without disrupting the DMX broadcast. This feature is not available even in wired RDM systems.
- **SHoW Key Security**
SHoW Key is an additional three-digit code that can be added to the Multiverse SHoW ID that will prevent any other system set on the same SHoW ID from interfering with your system.
- **Lock PIN**
When using a smartphone with the DMXcat app, a four-digit PIN can be applied to the Multiverse Transmitter to assure only authorized users can access it.
- **Forward Error Correction**
Allows the Receiver to detect and correct errors that may occur in the wireless transmission of data.
- **Ultra Low Latency**
Total average system latency of 4ms.
- **User Selectable Adaptive Spread Spectrum Frequency Hopping**
Adaptive Spread Spectrum Frequency Hopping identifies and masks off hopping channels that contain interference, replacing them in the hop sequence with alternate

channels.

- **Adjustable Output Power**

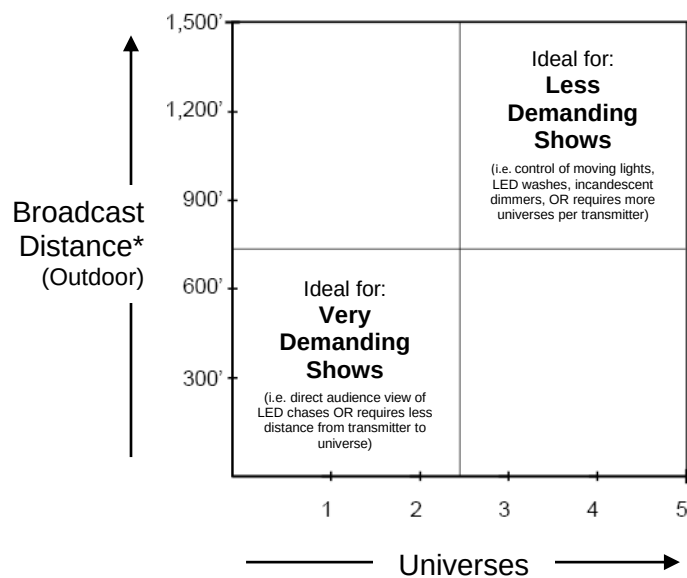
Sometimes an application calls for the most available broadcast power, but many entertainment systems can utilize lower output power to reduce detrimental effects on other radio systems in the venue, reduce reflections, and improve performance.

- **User Selectable SHoW IDs**

City Theatrical has always produced wireless DMX products that allowed the user to select the optimum transmission method. Users may select full bandwidth hopping, hopping limited to a section of the spectrum (including areas of the spectrum outside of the Wi-Fi range), or adaptive hopping, as well as selections that optimize fidelity, quantity of universes broadcast, and broadcast distance.

Multiverse Transmitter Theory of Operation

Setting up a successful multi universe broadcast requires planning before beginning. Although the 5910 Multiverse Transmitter can broadcast as many as nine universes of wireless DMX very demanding lighting cues such as direct view LED pixel chases or long distance broadcasts may require using less than the maximum number of possible universes to get the best radio fidelity.



*Distance figures may vary depending on show conditions.

Figure 1: Multiverse Theory of Operation

Multiverse Transmitter Theory of Operation, Continued

Here are some questions to consider when planning your radio setup:

1. How many universes will you broadcast from each transmitter?
2. Exactly which universes will you broadcast?
3. What is the status of the spectrum around you? This may influence your choice of radio frequencies on which to broadcast, which portion of the chosen band on which to broadcast, or even which model of Multiverse Transmitter to choose.
4. What is the approximate distance between your Multiverse Transmitter and your Multiverse Nodes?
5. Is your show's cueing relatively simple, such as conventional or LED fixtures and moving lights, or do you have direct view LED chases?
6. Are specialized antennas needed? Panel and Yagi antennas can help to overcome challenges related to fidelity or distance while keeping unneeded radio energy away from other systems in the venue.

Our Technical Services team is always available to assist you in making these setup decisions. Call 201-549-1160 or email support@citytheatrical.com

Understanding the Radio Spectrum Around You

Radio waves are not visible, and it is often not possible to understand the amount of radio activity around you without doing some research and testing, but it is important to the quality of your broadcast to do so. One way is to ask about and to be aware of other radio gear on site that is in the 2.4GHz or 900MHz bands. You can find this by searching carefully for broadcast devices and antennas, and by asking your colleagues if they are using any radio gear in your area of the spectrum. **We recommend using RadioScan™.** For users of City Theatrical Multiverse®, RadioScan™ will guide you in creating the optimum broadcast plan for your production by helping choose the best SHoW ID based on the number of universes being broadcast and the best area of the spectrum on which to broadcast.

RadioScan™

City Theatrical Inc. offers a comprehensive 2.4GHz and 900MHz spectrum analyzer. Available for both Windows and macOS, RadioScan™ enables easy visualization of radio frequencies used in your venue to create a well-informed plan to optimize your wireless connections. This product includes a RadioScan™ hardware dongle and accompanying free RadioScan™ software downloadable on our website. For more information about features and specification please visit <http://www.citytheatrical.com/Products/radioscan>

If your analysis reveals a lot of radio activity in one particular area of the spectrum, by using the “Band” selection of the SHoW ID (fourth digit of the SHoW ID) you can direct your broadcast to a quieter area of the spectrum. If all areas seem crowded you can choose either full spectrum hopping, adaptive hopping, or, in the 2.4GHz band only, “extremely high band” hopping. See the SHoW ID chart in Table 1 on page 7.

Choosing Between 2.4GHz and 900MHz

900MHz radios (licensed for use only in North America) can broadcast longer distances and can pass through objects better than 2.4GHz radios, and there is often less radio activity in the 900MHz band. The 2.4GHz radio can carry more data, so up to five universes of output are possible on Multiverse's 2.4GHz radios, while the 900MHz radio can carry up to four universes.

Choosing a SHoW ID

SHoW ID is a proprietary system developed by City Theatrical to give wireless DMX users the ability to optimize their systems to meet the conditions of the environment in which they are operating. Using the knowledge and information you have gathered so far, you can now choose a SHoW ID, which is simply a descriptive number that represents a combination of four elements:

- The radio frequency
- The data rate (which determines the number of universes you can broadcast)
- The section of the wireless band where the radio frequency hopping will occur
- The hopping pattern.

These choices combine to form a number that sets the basic broadcast parameters of the system. Let's take a closer look at the SHoW ID numbering system:

Table 1: Selecting Your Multiverse SHoW ID

Multiverse SHoW ID Example: **24302**

Prefix	Data Rate	Band	Hop Pattern																							
9 900MHz Multiverse	Faster data rates provide more DMX universes. Slower data rates travel longer distances and provide more immunity to interference.	Specifies which sections of the wireless band the frequency hopping utilizes.	If multiple wireless systems need to operate with the same data rate and band this value will change the hopping pattern to minimize overlapping between the two systems. Can be any number from 0 – 9 (not all bands have all Hop Patterns).																							
24 2.4GHz Multiverse	<table><tr><th colspan="2">900MHz: Universes</th><th>Range</th></tr><tr><td>1</td><td>1</td><td>2000' Outdoor 300' Indoor</td></tr><tr><td>2</td><td>2</td><td>2000' Outdoor 300' Indoor</td></tr><tr><td>3</td><td>4</td><td>500' Outdoor 300' Indoor</td></tr></table> <table><tr><th colspan="2">2.4GHz: Universes</th><th>Range</th></tr><tr><td>1</td><td>1</td><td>1500' Outdoor 300' Indoor</td></tr><tr><td>2</td><td>2</td><td>1500' Outdoor 300' Indoor</td></tr><tr><td>3</td><td>5</td><td>1000' Outdoor 100' Indoor</td></tr></table>	900MHz: Universes		Range	1	1	2000' Outdoor 300' Indoor	2	2	2000' Outdoor 300' Indoor	3	4	500' Outdoor 300' Indoor	2.4GHz: Universes		Range	1	1	1500' Outdoor 300' Indoor	2	2	1500' Outdoor 300' Indoor	3	5	1000' Outdoor 100' Indoor	0 Use full range of 900MHz or 2.4GHz band. 1 Use only low band channels. 2 Use only mid band channels (available for Data Rate 1 only). 3 Use only high band channels. 4 Use only extreme high band to avoid WiFi (2.4GHz only). 5 Adaptive hopping. Avoids busy channels by analyzing spectrum.
900MHz: Universes		Range																								
1	1	2000' Outdoor 300' Indoor																								
2	2	2000' Outdoor 300' Indoor																								
3	4	500' Outdoor 300' Indoor																								
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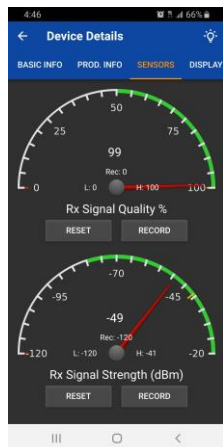
Note: Not all combinations of digits are possible and unused numbers are reserved for future use.

The factory default SHoW IDs are 24250 (for the 2.4GHz radio) and 9250 (for the 900MHz radio), which allows a four-universe broadcast.

Note: Multiverse Transmitter does not utilize SHoW DMX Neo SHoW IDs.

Note that transmitting more universes may require shorter broadcast distances, as does achieving the highest fidelity levels that may be required for direct view pixel chases, and both concepts are heavily dependent on spectrum traffic around you.

Your show may not require multiple universes, or the use of both the 2.4GHz and 900MHz radios together. If that is the case, just follow the instructions on page 8 for your chosen radio setup.



You can run a quick test using your proposed SHoW ID to check the received signal quality at your receiving Multiverse Nodes (receivers) by using RDM to view to view the “Sensors” tab on your Nodes. They will look like this (although your signal quality will vary according to your conditions). Signal quality of 85% or higher will achieve good fidelity, and signal quality of even 40-50% will often provide adequate fidelity. See page 11 for more information on setting up Multiverse Nodes as receivers.

Multiverse Transmitter Setup Using DMXcat

After SHoW IDs have been chosen that meet the needs of your show for each of the two radios in the Multiverse Transmitter, you can begin to set up your Multiverse Transmitter and Multiverse Nodes.

The setup of the Multiverse Transmitter is achieved only with the use of City Theatrical's DMXcat® app. This app is a free download from the Google Play Store, Apple App store, or Amazon App Store (for Amazon Fire), and the DMXcat hardware is built into the Transmitter.

Once you have loaded the DMXcat app, go to Settings, tap Bluetooth Device, and look for the serial number of your Multiverse Transmitter on the list of recognized devices. Select Connect and you will be in communication with your transmitter.

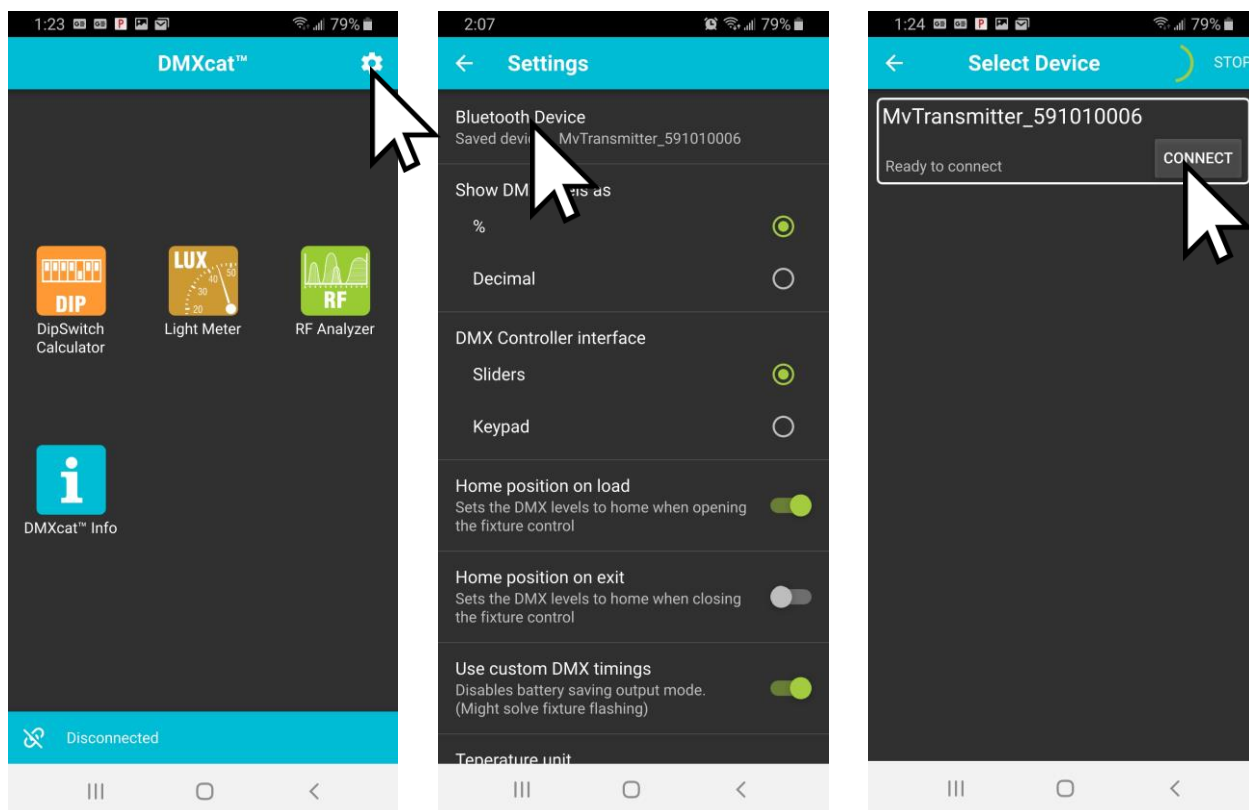


Figure 2: Connecting to Your Multiverse Transmitter with DMXcat

Go back to the home screen of the DMXcat and select Multiverse Transmitter. Your Multiverse Transmitter will be discovered.

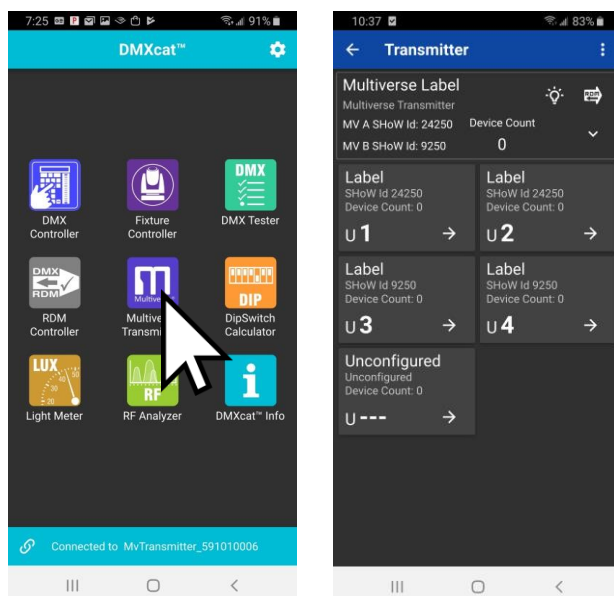
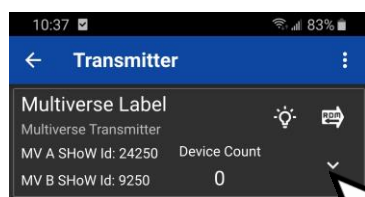
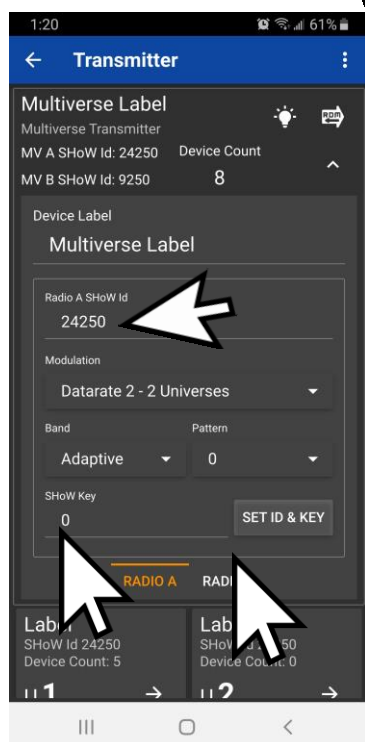


Figure 3: Discovering Your Multiverse Transmitter with DMXcat (shown with default SHoW IDs)



Select the down arrow on the Transmitter screen to open the options screen:



On this screen you can enter your SHoW ID for both radios, and an optional SHoW Key. SHoW ID and SHoW Key must match on Multiverse Transmitter and all receivers.

Alternatively, you can choose the Modulation, the band, and the hop Pattern, and optionally, a SHoW Key (see page 11 for more information on SHoW Key), tap SETID & KEY, and the corresponding SHoW ID will be set for you.

Use these buttons to select Radio A or Radio B.

Figure 4: How to Open Multiverse Transmitter Options

If you change from the default SHoW IDs to SHoW IDs that produces the maximum number of universes, your Multiverse Transmitter screen will look like this. To redefine the connection of your choice of universes to radios, see the instructions below.



Figure 5: SHoW IDs with Maximum Universe Output

Attaching Universes to SHoW IDs

Once you choose a SHoW ID, a series of boxes will be shown in this setup screen. These boxes represent the number of universes that each radio can carry. Note the screen above shows five boxes for the 2.4GHz radio and four boxes for the 900MHz radio. By tapping on the “U” icon in the box you can edit the universe number and add descriptive names such as Truss 1, or Electric 3, to help remind you where that universe is broadcasted to in your show. Tapping on the horizontal arrow will take you to the connected devices.

The box for each universe will show:

- The SHoW ID of the radio
- The universe assigned to it
- The number of devices (receivers and lighting fixtures) detected on that universe connected by that radio’s SHoW ID.
- Any custom label you have given this universe
- A “→” symbol that when tapped will take you to a screen that shows the receivers on that universe.

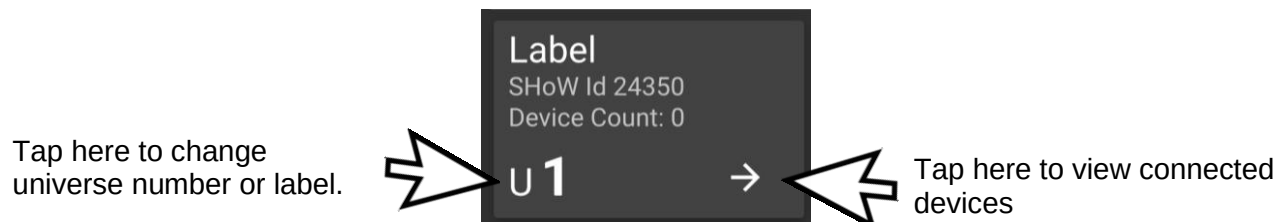


Figure 6: Universe Display on DMXcat

Setting up Multiverse Nodes as Receivers

Now set up your Multiverse Nodes as your receivers. Set the user interface screen on each Node to match the Multiverse Transmitter's corresponding SHoW ID (and SHoW Key if used) and universe. Do this for each Node in your system. Note: Any Multiverse Node acting as a receiver that is set on a universe that is not being broadcast by a Multiverse transmitter (either a Transmitter or Node) will show its universe in a yellow color.

When your Transmitter and Nodes are in communication, the signal quality bars on the Node will be lit. When DMX is fed to the Transmitter, the RX symbol on the top left of the node will stop blinking, and any properly addressed DMX devices attached to the Node will be controllable from your lighting controller or by DMX and RDM from your DMXcat.

Setting up Multiverse SHoW Babys as Receivers

Multiverse SHoW Babys can be used as receivers with a Multiverse Transmitter. Since the default Multiverse SHoW Baby SHoW ID (201) is a SHoW DMX Neo SHoW ID and is not compatible with Multiverse Transmitters, using Multiverse SHoW Baby with a Multiverse Transmitter requires using an RDM controller such as a DMXcat dongle connected directly to the SHoW Baby, to change the SHoW ID settings in RDM. In the Multiverse SHoW Baby RDM, go to Device Details, Manufacturer Settings, and change the SHoW ID (and SHoW Key if used), and go to Endpoint Settings and change the universe, to match your Multiverse Transmitter's 2.4GHz radio. When using a Multiverse SHoW ID with Multiverse SHoW Baby, the "ID/Data" light will be deep blue.

Note: Multiverse SHoW Baby operates only in the 2.4GHz band. Multiverse Transmitter (P/Ns 5910 and 5911) does not utilize SHoW DMX Neo SHoW IDs. Thus, Multiverse Transmitter is not compatible with SHoW Baby 6 or earlier versions of SHoW Baby products. It is compatible with Multiverse SHoW Baby when the Multiverse SHoW Baby is set to a Multiverse SHoW ID.

Looking At Your Show with DMXcat

During and after setup, you can use your DMXcat to connect to the Multiverse Transmitter for changing addresses, troubleshooting, focusing, or other lighting tasks. Here are some things you can learn from the main screen:



This shows the total number of devices (receivers and lighting fixtures) attached to the Transmitter's two radios.

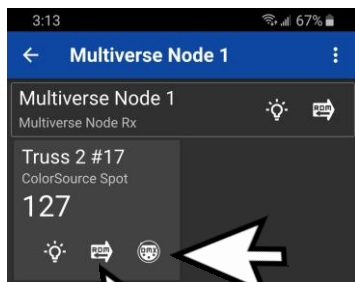
"Device Count" shows the total number of receivers and lighting fixtures on each radio's universe assignment.

Tapping on the horizontal arrow will take you to the underlying receiver(s), which looks like the image on the next page.



This screen shows one Multiverse Node connected to universe 14 on SHoW ID 9250.

Tapping on the arrow will load the underlying lighting fixture(s) connected to that receiver



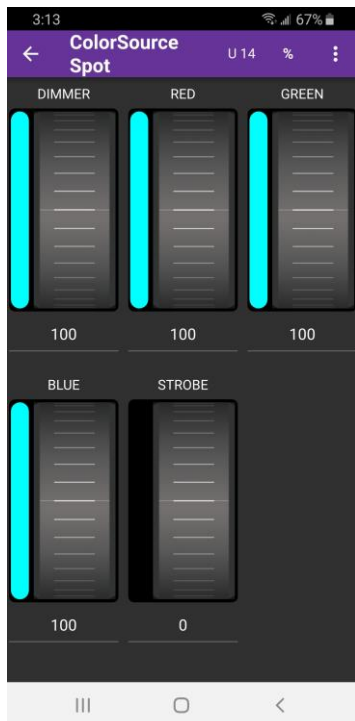
This screen shows one ColorSource Spot connected to the Multiverse Node, DMX address 127.

Tapping on the DMX connector symbol will load the user interface for this fixture's personality. See below.



Tapping the RDM symbol will take you to the fixture's full RDM menu

Tapping the light bulb symbol will perform an RDM "identify" command on the fixture causing it to identify itself in some way.



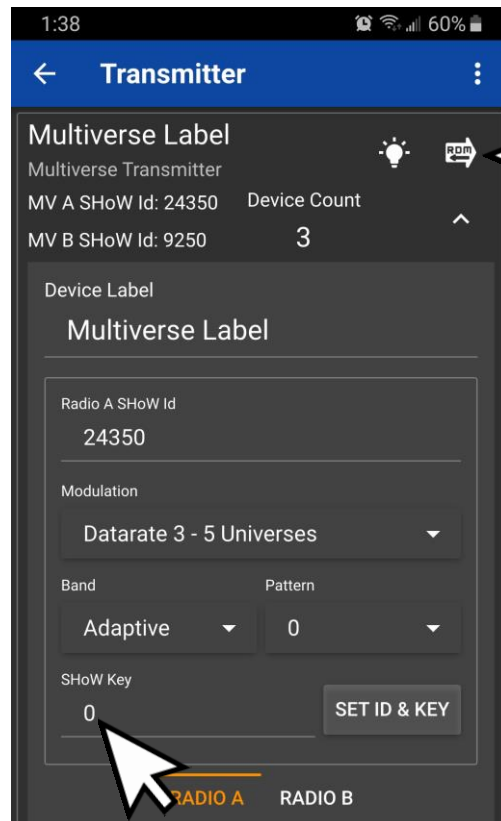
In this screen you have direct control of the fixture.

When controlled this way, the fixture's DMX slots take priority over console data. All other slots in the DMX frame are set to console levels.

Advanced Settings

Setting a SHoW Key

If two City Theatrical systems are set up near each other, such as in adjacent theatres, it is possible that if those two systems are set on the same SHoW ID one system could inadvertently control the other. SHoW Key is an optional three-digit adjunct to the SHoW ID that locks down your system from any outside control. SHoW Key is set on the main Transmitter screen, and on the Manufacturer Settings screen of the Multiverse Node or SHoW Baby. Range is 0-500, default is 0 (off).



Tap the RDM symbol to access the Transmitter's RDM menu.

Figure 7: Setting a SHoW Key with DMXcat

Other Advanced Transmitter Settings

By tapping the RDM symbol on the Transmitter's main menu (shown above), then tapping:

-Sub Devices

-RDM for either Sub Device 1 or Sub Device 2 (the two radios)

-Manuf. Settings

The Device Details menu is shown. This is where you can make several additional advanced settings.

- **Output Power**

The output power can be changed from Max (default) to three other reduced settings. Reducing output power can reduce your radio footprint and improve fidelity by reducing reflections.

- **Antenna Selection**

If a panel (PN 5981) or Yagi (PN 5982) antenna is used instead of the default omni antenna, choose it on this menu for optimum performance and to remain in compliance with FCC and other radio compliance regulations. A PN 5638 adapter cable is required to use a panel or Yagi antenna.

- **Forward Error Correction**

Allows the Receiver to detect and correct errors that may occur in the wireless transmission of data. The extra data reduces the number of slots that can be transported, Max reduces slots by 50%, Med by 33%, Min by 25%. This setting only needs to be set at the Transmitter. Default is Off.

- **mDMX**

Can improve fidelity while dramatically reducing radio energy broadcast into the spectrum. Only needs to be set at the Transmitter. Default is on.

Multiverse Node Advanced Settings

Tap the "MENU" button on the user interface screen of the Multiverse Node, Power, Antenna, SHoW Key, Forward Error Correction, and mDMX can be set as described above.

Some options are only available when in Tx mode.

- **RDM Traffic**

The Multiverse Node is always discoverable by the Transmitter as an RDM device, but traffic downstream of the node can be turned on or off here. To see any RDM devices connected to the Node, RDM must be turned on. Default is off.

Note: When a Multiverse Node is used as a Transmitter, RDM Traffic must be turned on to see Multiverse Nodes used as Receivers.

- **Backlight Timeout**

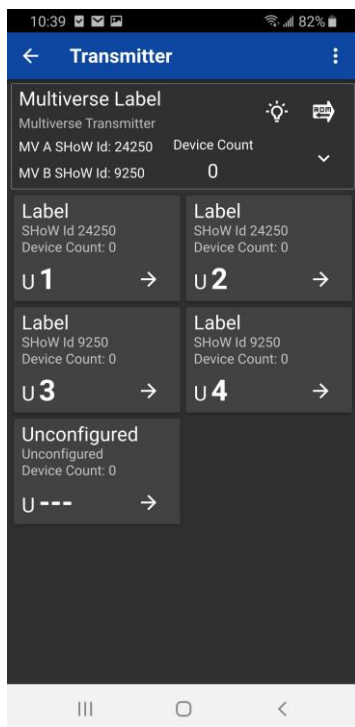
The Node screen's backlight can be set to stay on all the time or to turn off after a selected amount of time. Default timeout is 30 seconds.

- **Backlight Level**

The brightness of the Node screen's backlight can be set at any level between 1% to 100%. Default is 100%.

Multiverse Transmitter Menu Descriptions

The full Multiverse menu is reachable only through RDM via the City Theatrical DMXcat app. This app is a free download from the Google Play Store, Apple App store or Amazon App Store (for Amazon Fire), and the DMXcat hardware is built into the Transmitter.



Transmitter Setup Main Screen

If you tap the Multiverse Transmitter icon on the main screen of the DMXcat app, you will reach this main Transmitter setup screen.

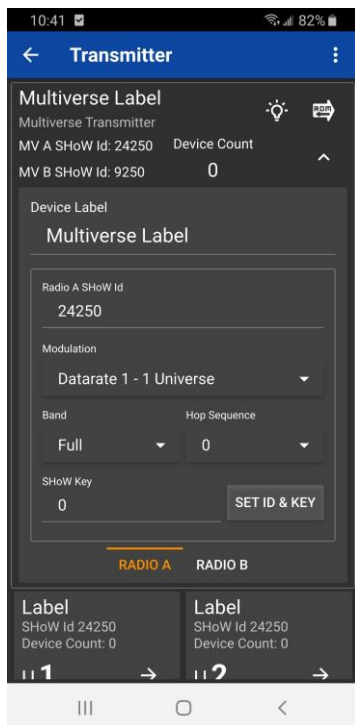
The lower portion shows the quantity of universes appropriate for the SHoW ID you have chosen for each radio. By tapping the “U” icon in each box, you can directly edit the universe attached to that radio. Tapping the “→” symbol will take you to a screen that shows the receivers on that universe.

Labels are user editable.

Each universe box also shows the Device Count (the number of receivers and RDM lighting fixtures attached to it).

There will always be one cell labelled “Unconfigured” where any Nodes that are not addressed to a valid universe will be found.

The “more options” icon in the upper right portion of the screen allows various ways of sorting this screen.



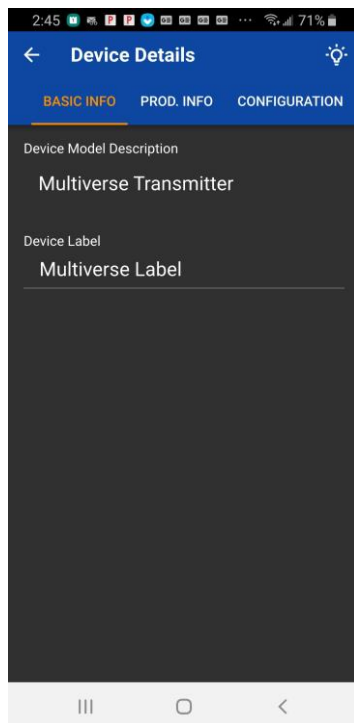
By tapping the drop-down menu arrow, a fuller set of Transmitter options are shown.

Tap the light bulb icon to do an RDM identify of the Transmitter. All indicator lights on the Transmitter will flash in .25 second intervals.

Device Label and Radio (A or B) SHoW ID are user editable, Just type in the field. SHoW ID can also be set by entering choices in the pull-down menus of Modulation, Band, Hop Sequence, and SHoW Key, and tapping Set ID and Key.

Choose between the Radio A and Radio B tabs to set SHoW ID on each of the two wireless DMX broadcast radios.

Tapping the RDM icon in the upper right portion of the screen will take you to the Device Details screen (see below)

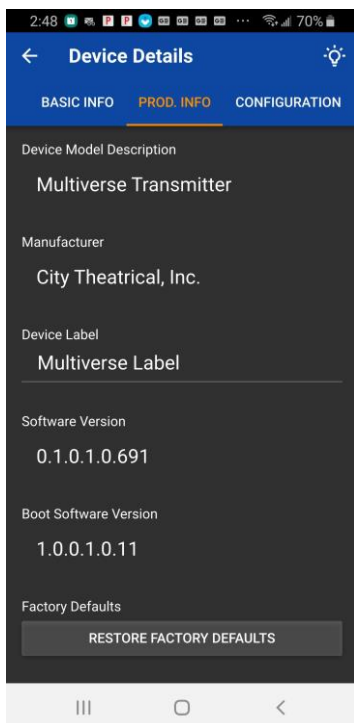


Basic Info

There are seven menus on the **Device Details** screen.

Basic Info shows the Device Model Description.

Device Label is user editable.



Prod. Info

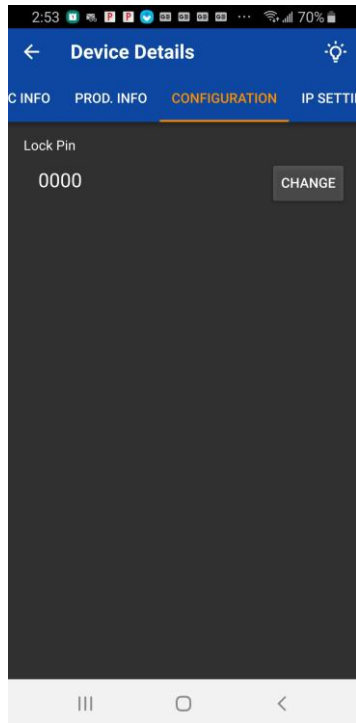
Shows Device Model Description, and Manufacturer.

Device Label is user editable.

Software Version and Boot Software Version are shown.

Factory Defaults are reset by tapping the “Restore Factory Defaults” bar.

RDM UID (not shown in this photo)



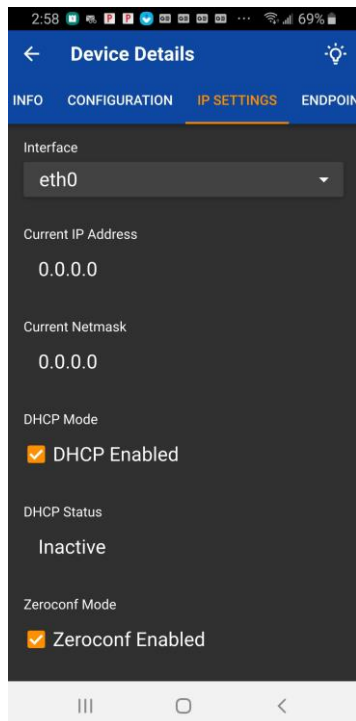
Configuration

The Lock PIN is set on this screen. Using the Lock PIN will prevent anyone who is not authorized from accessing the Multiverse Transmitter from their DMXcat app.

Insert any PIN from 0001 to 9999. Insert 0000 to remove PIN.

To reset a lost PIN, depress the switch inside the very small hole on the end of the Transmitter just to the right of the Ethernet input.

Note: Holding this switch for approximately five seconds will reset the entire Transmitter to factory defaults.



IP Settings

Interface choices are shown.

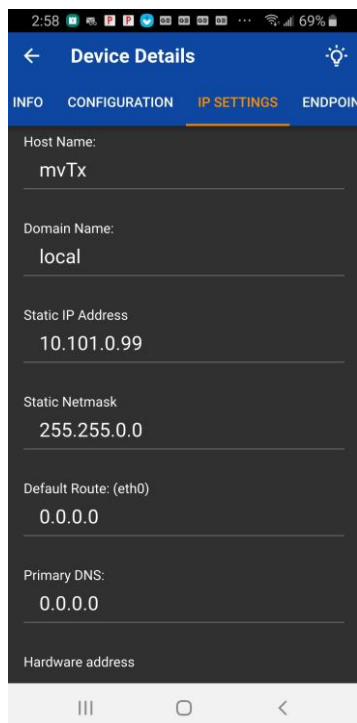
Current IP address is shown.

Current Netmask is shown.

Enable or disable DHCP (default is enabled).

DHCP status is shown.

Enable or disable Zero-configuration mode (default is enabled).



IP Settings (continued)

Host name is shown, user editable. Default is: mvTx

Domain name is shown, user editable. Default is: local

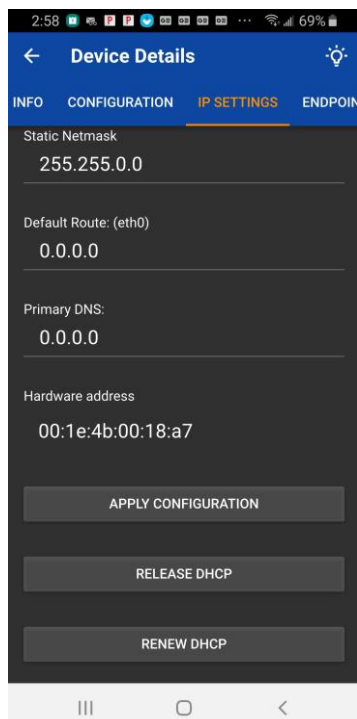
Static IP address is shown, user editable.

Static netmask is shown, user editable.

Default route (eth0) is shown, user editable.

Primary DNS, user editable.

Note: When changes have been made, press “Apply Configuration” below for changes to take effect.



IP Settings (continued)

Hardware address (MAC address) is shown.

Apply configuration changes.

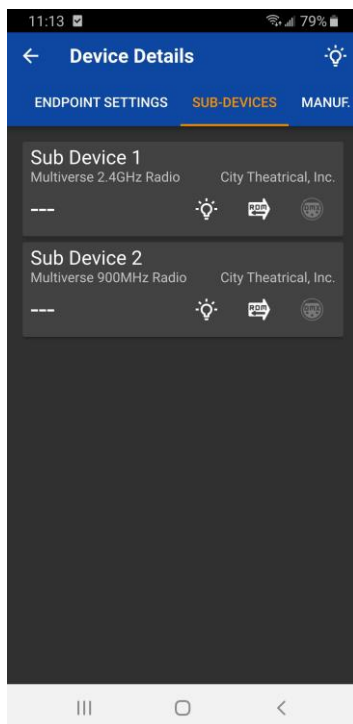
Release DHCP.

Renew DHCP.



Endpoint Details

This screen is a duplicate of the one on the main Transmitter page. On it, you can attach universes to SHoW IDs (on each of the two radios), as well as change the label.

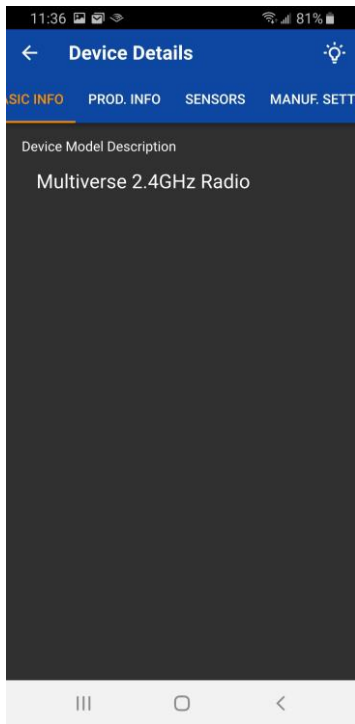


Sub Devices

This menu allows deeper control of each of the two wireless DMX broadcast radios (Sub Devices 1 and 2). The RDM submenus reachable from this screen include:

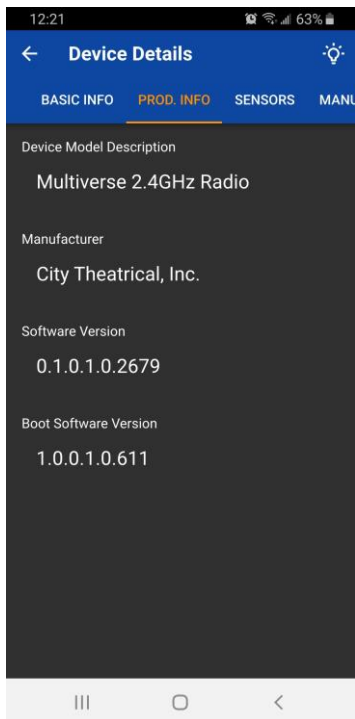
- Basic Info
- Product Info
- Sensors
- Manufacturer Settings

These four sub menus are explained in further detail on the next page.



Sub Devices, Basic Info

Shows the type of radio.



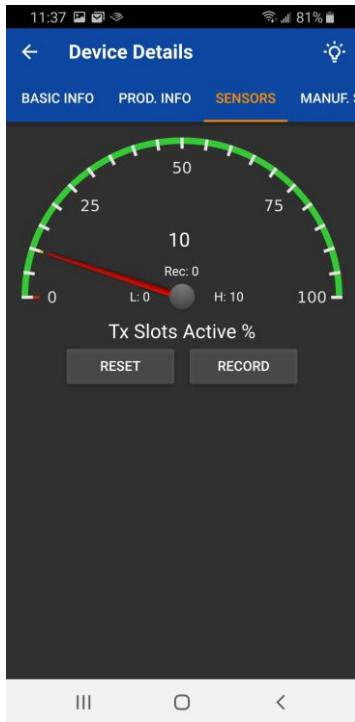
Sub Devices, Product Info

Shows the type of radio.

Shows manufacturer.

Shows radio firmware version.

Shows radio bootloader firmware version.



Sub Devices, Sensors

Shows what percentage of DMX slots are active at any given time, in percent.

Sub Devices, Manufacturer Settings

User editable SHoW ID field (duplicate of setting on main Tx screen).

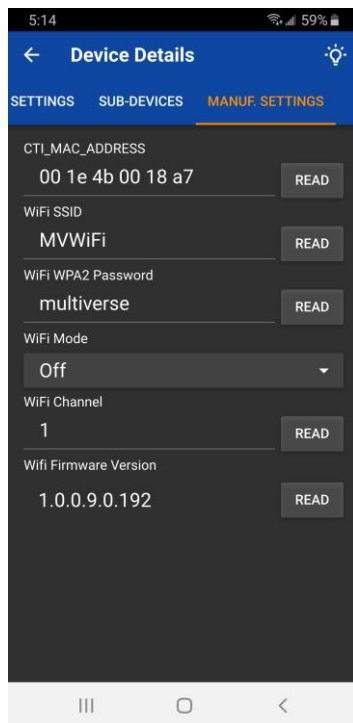
User selectable output power. Default is Max.

User selectable Antenna Selection. Default is Omni.

User editable SHoW Key field prevents any other system on the same SHoW ID from controlling your system. (Duplicate of setting on main Tx screen). Range 0-500, Default is 0

User selectable Forward Error Correction allows receivers to detect and correct errors that may occur in the wireless transmission of data. The extra data reduces the number of slots that can be transported, Max reduces slots by 50%, Med by 33%, Min by 25%. Only needs to be set at the Transmitter. Default is Off.

mDMX can improve radio fidelity and decrease radio energy used. Default is On.



Manufacturer Settings

(main Transmitter menu)

MAC address of the Transmitter.

WiFi SSID is user editable. Default is MVWiFi

WiFi WPA2 Password is user editable. Default is multiverse.

WiFi Mode - Default is Off.

WiFi channel is user editable. Range is 1-11.

WiFi Firmware Version.

Specifications

Table 2: Physical Characteristics

Product Information	
Product Name	Multiverse Transmitter 900MHz/2.4GHz
Part Number	5910
Maximum Concurrent Universes	9
Frequency Range	2400 – 2480 MHz
	902 – 928 MHz

Physical Specifications	
Length	196.9mm (7.75 in)
Width	101.5mm (4.0 in)
Height	47mm (1.85 in)
Weight	0.57 Kg (1.25 lb)
Construction	Die Cast Aluminum

Connection Specifications	
Antenna(s)	RP-SMA female
AC	powerCON TRUE1 in/thru
DC	Locking DC Jack, 5.5mm x 2.1mm, center positive, 12.1mm mating depth; EtherCON

Functionality	
Wi-Fi Capability	802.11 b/g/n
User Interface	DMXcat® app (for iPhone, Android or Amazon Fire), free download
Version Control	Free firmware updates on product pages of CTI website
RDM Configuration	Configurable over RDM
RDM Features	RDM Proxy, RDM Responder

Power	
High Voltage Input	100-240VAC 50/60 Hz
Low Voltage Input	5-30VDC
Power over Ethernet (PoE)	Class 0
Maximum Wattage	0.5W

Radio Technology	
Latency	4 ms average
RF Sensitivity	-95dBm
Loss of Data Behavior	Output stops
Broadcast Power	3.2mW, 10mW, 32mW, 100mW
Broadcast Modes	Adaptive, Full, Low, Mid, High, Max
Show IDs	237

Supported Protocols	
RDM ANSI E1.20 via Art-Net / DMXcat	
Streaming ACN (sACN)	
Art-Net I, II, and III	

Product Information	
Use Environment	Indoor
Ambient Temperature Range	0 C to 40° C
IP Rating	IP50
Compliance	FCC, IC, ETL
Warranty	One year

What's Included



Figure 8: What's Included

Table 3: Included Item Descriptions and Part Numbers

Label in Figure	Item Description	Part Number
1	Multiverse Transmitter 900MHz/2.4GHz	5910
2	Hanging Bracket with hardware	5974
3	N5-15P to powerCON TRUE1, 14AWG, 8'	5840
4	Four Antennas, Omni Broadband, 900MHz/2.4GHz, 2dBi/4dBi	5980

Face Panel

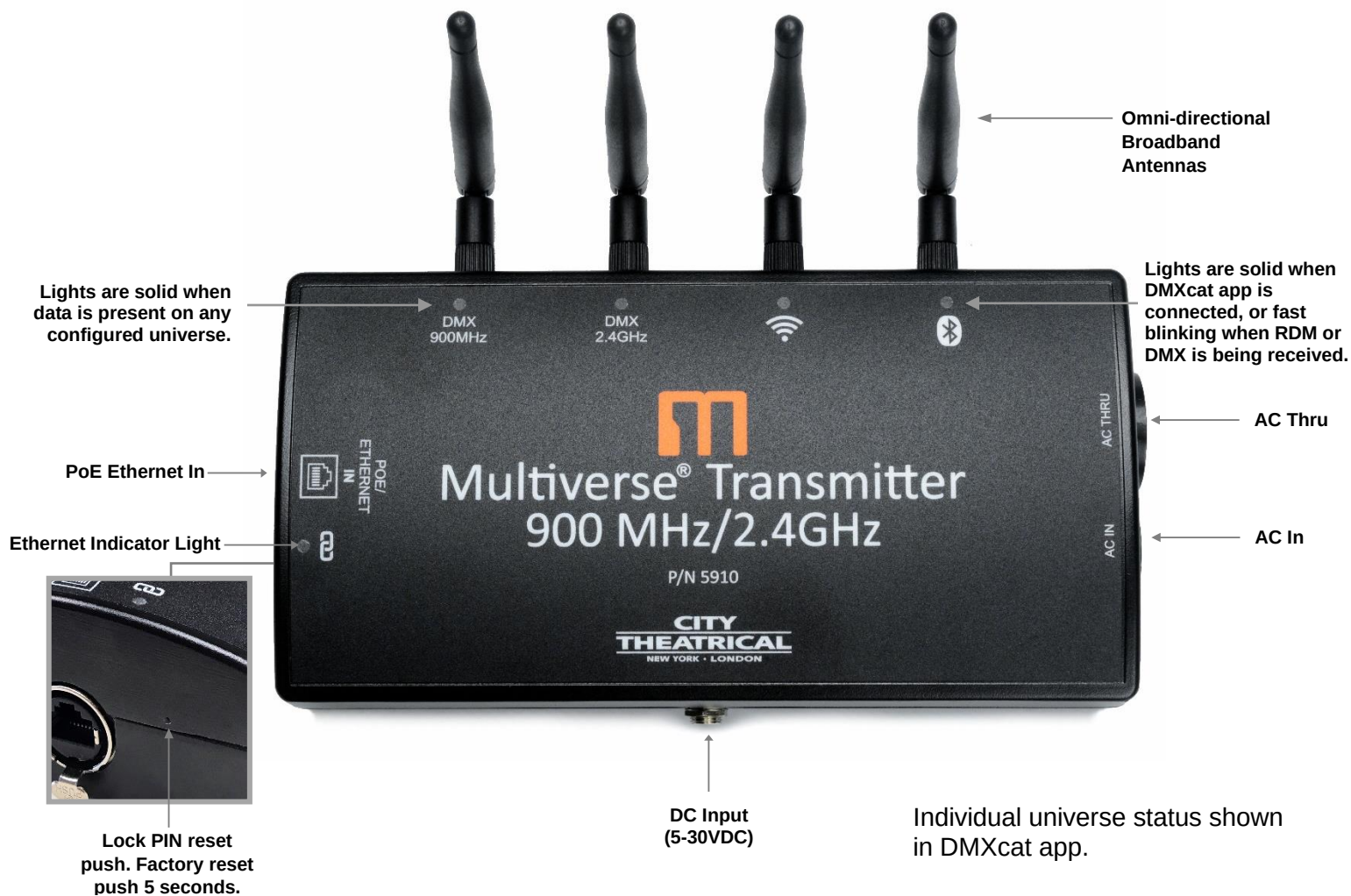


Figure 9: Face Panel

Mounting

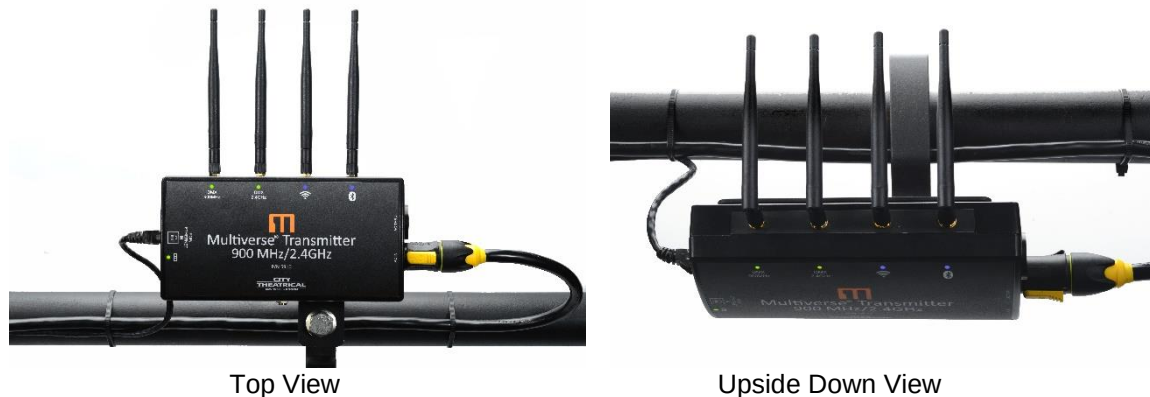


Figure 10: Pipe Mount

Multiverse Transmitter Quick Start Guide

Here is how to set up a basic wireless DMX distribution system with one Multiverse Transmitter and four Multiverse Nodes as receivers. Here is a layout of the system, starting from factory defaults on all devices:

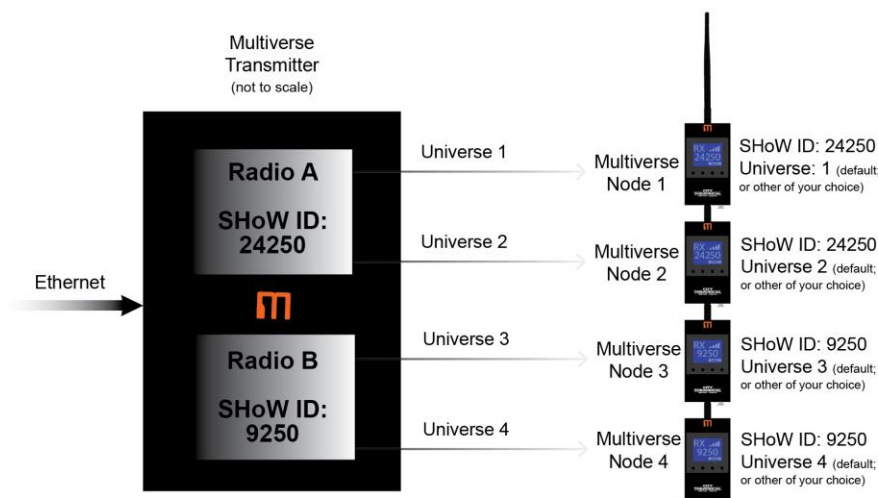


Figure 11: Basic Multiverse System Setup in Default Mode

1. Install the Multiverse Transmitter in a convenient location within range of the desired Receiver location. Transmitter and Receivers should be elevated above the audience (or other barriers) and located within sight of each other whenever possible. Keep Transmitter and Receiver antennas vertical and parallel to each other.
2. Connect the DMX lighting console's streaming ACN or Art-Net output to the Multiverse Transmitter via an Ethernet cable.
3. Install the Multiverse Nodes in the desired locations. Avoid placing the Receivers so that there is a radio barrier between it and the Transmitter. It is permitted to place the Receiver inside or behind an object (such as a prop or set piece), providing the Receiver has adequate ventilation and the object is not a radio barrier. Radio barriers include metal, some glass, and water. Broadcast fidelity is always improved by having Transmitter and Nodes in line of sight of each other and above people and other obstructions.
4. Connect the Multiverse Nodes' DMX Outputs to the DMX inputs of equipment you want to control. Just as with any other DMX device, set the DMX address and termination as needed.
5. Configuring the Multiverse Transmitter:
 - a. Power up the Transmitter.
 - b. Connect to your Transmitter with your DMXcat app. The serial number of your Multiverse Transmitter should appear as a selectable device on the Device List in the Settings menu of your DMXcat. You may need to tap "SCAN" to refresh the list of devices.
 - c. After you have connected to your Multiverse Transmitter, go to the main DMXcat screen and tap the Multiverse Transmitter icon.
 - d. If not using the default universe numbers (1,2,3,4) input the desired universe numbers into the Multiverse Transmitter and Multiverse Nodes.
 - e. Select an additional SHoW Key if desired and input it into the Multiverse Transmitter and Multiverse Nodes

- f. Set any unused universes to “0” to disable broadcast of that universe’s DMX slots.
- g. If you add any Multiverse Nodes to your system that have not had their universe configured, you can find them in the “Unconfigured” box on the main Transmitter screen.
- h. Test your system.

Troubleshooting

Table 4: Troubleshooting Guide

Symptom	Solution(s)
Unit does not power up.	Check that power cable is properly installed.
	Test power outlet with another device.
Fixtures connected to the receiver are not responding.	Check that the Tx and Rx symbols on transmitters and receivers are solid.
	Check that SHoW ID and SHoW Key match on transmitters and receivers.
	Check that Universe setting matches on Tx and Rx.