

ETC Information Guide

Multiverse Wireless Setup

Overview

This document is a resource for setting up ETC products that use City Theatrical Multiverse® wireless communication.

Assess the Wireless Environment

Before you configure Multiverse wireless devices for use with ETC Multiverse-enabled products, assess the current wireless usage in the space where the products will be used. Determine which channels are currently being used, and which channels are used by mission-critical devices. After you determine which channels are being used and are mission-critical, you can configure the Multiverse devices to avoid conflict with these channels.

You can use several methods to find this information:

- Check with others who work in the space to see what wireless devices they are using and what channels those devices use.
- Use tools for Wi-Fi spectrum analysis, such as City Theatrical RadioScan® Spectrum Analyzer (citytheatrical.com/Products/radioscan). This tool will measure Wi-Fi and non Wi-Fi activity, and identify SSID (Service Set Identifiers) and their broadcast channels for networks within range. RadioScan helps you choose the best SHoW ID based on the number of universes being broadcast and the best area of the spectrum to broadcast in.
- City Theatrical DMXcat® Multi Function Test Tool (citytheatrical.com/Products/dmxcats) has a built-in basic Wi-Fi frequency analyzer, as do many cell phone apps. These tools show Wi-Fi activity, but do not show frequency-hopping radios like wireless DMX. However, if no other frequency analyzer is available, these apps can give basic information about the spectrum activity to avoid.

Guidelines for Wireless Setup

When planning the positioning of ETC Multiverse-enabled products, you can assume a range of approximately 100 m (328 ft) for indoor applications. This range can be affected by a number of factors, though.

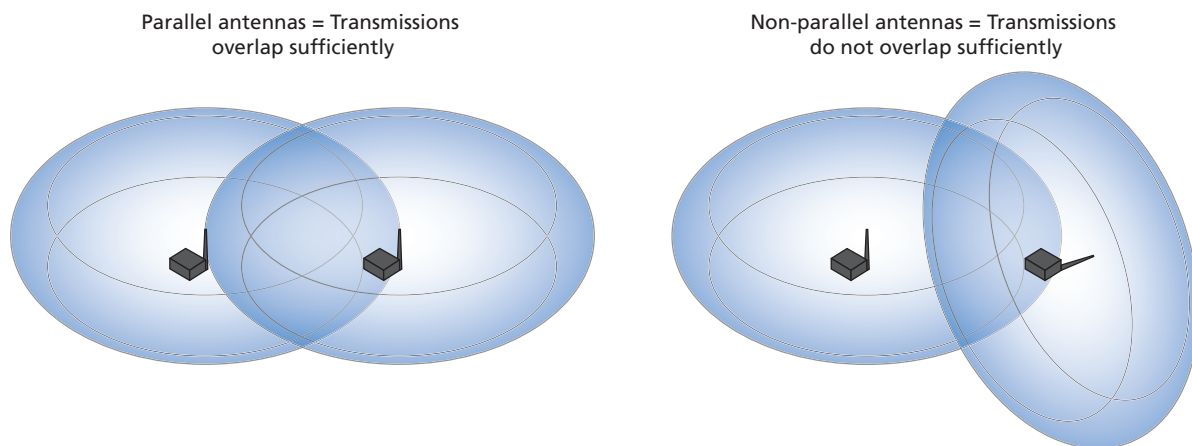
- Range can be decreased by:
 - Broadcasting through scenery, walls, or people
 - Reflections off walls
 - Interference from other radios (which causes signal strength to decrease)
- Range can be increased by:
 - Positioning the transmitter and receiving device in the same line of sight
 - Positioning transmitter antennas as high as possible
 - Replacing the default omni-directional antenna with a panel antenna or directional (Yagi) antenna



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Omni-directional antennas (the antennas on most wireless DMX products) create doughnut-shaped patterns, and the patterns must overlap between the transmitting device and receiving device. To ensure the overlap, make sure that the antennas are parallel to each other.



Optimize the Wireless Configuration

After you assess the environment and set up your wireless transmitters and ETC Multiverse-enabled products, you can optimize the Multiverse configuration.

- **Bandwidth:** Set the bandwidth for the transmitters based on your assessment of other wireless activity in the environment. For example, if other critical devices are using channels 1–6, set the Multiverse devices to use high-band channels or extremely high-band channels.
- **Output power:** After you have set the bandwidth, test the setup. Use the signal quality bars on the transmitter user interface (see table below), or use RDM to monitor the signal quality, and then decrease the output power to the minimum level required for successful communication between transmitters and ETC products. Excess power output can cause reflections and can degrade performance.

Signal Quality

Number of Bars	Quality Range	Description
4	80–100%	Excellent
3	50–79%	Good
2	30–49%	Acceptable
1	10–29%	Marginal

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Recommended Multiverse Device Settings

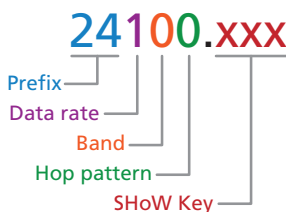
Error Correction

We recommend that you set the **Error Correction** parameter to **Yes** on the transmitting device. This setting improves reception fidelity at the cost of a slightly reduced data rate.

SHoW ID

We recommend that you start with a Multiverse SHoW ID of 24100.xxx and then adjust values as needed while you test the wireless setup.

What do these SHoW ID values mean?



Parameter	Description	Values	Recommended Value																
Prefix	Multiverse product type	24 = 2.4 GHz Multiverse	24																
Data rate	<ul style="list-style-type: none"> Faster data rate = more DMX universes Slower data rate = greater range and more immunity to interference 	<table border="1"> <thead> <tr> <th>Value</th> <th>Universes</th> <th>Indoor Range</th> <th>Outdoor Range</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>100 m</td> <td>500 m</td> </tr> <tr> <td>2</td> <td>2</td> <td>100 m</td> <td>500 m</td> </tr> <tr> <td>3</td> <td>5</td> <td>30 m</td> <td>300 m</td> </tr> </tbody> </table>	Value	Universes	Indoor Range	Outdoor Range	1	1	100 m	500 m	2	2	100 m	500 m	3	5	30 m	300 m	1
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1	1	100 m	500 m																
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Band	Channels within the wireless band that the frequency hopping utilizes. Set this parameter to avoid channels being used by other mission-critical wireless devices or as guided by RadioScan Spectrum Analyzer.	<ul style="list-style-type: none"> 0 = Use full range of 2.4 GHz band. 1 = Use only low-band channels (1–6). 2 = Use only mid-band channels (4–9). 3 = Use only high-band channels (7–11). 4 = Use only extremely high-band channels to avoid Wi-Fi. 5 = Adaptive hopping. Avoid busy channels by analyzing spectrum. 	0																
Hop pattern	Pattern for frequency hopping. If multiple wireless systems must operate with the same data rate and band, use this value to minimize the overlap between the two systems. Because each hopping pattern is unique, only the receiving devices with the same hopping pattern will receive the DMX broadcast.	Any value from 0–9.	0																
SHoW Key	Security value. Set a SHoW Key to ensure that only Multiverse-enabled devices with the correct SHoW Key can interact with the Multiverse transmitters. This prevents other transmitters from communicating with the receiving devices.	Any value from 0–500.	Any																

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Troubleshooting

Several ETC Multiverse-enabled products have resources for troubleshooting. On the fos/4 Panel, fos/4 Fresnel, Source Four LED Series 3, and Desire Fresnel fixtures, use the **About Control** screen to see current Multiverse status.

1. Press the **Menu** button, turn the Intensity encoder to navigate to **Diagnostics**, and then press the Intensity encoder to select it.
2. In the **Diagnostics** screen, turn the Intensity encoder to select **About Control**, and then press the Intensity encoder.
3. Turn the green encoder to change the data display from **DMX** to **Multiverse**.