

CITY THEATRICAL

NEW YORK • LONDON

Multiverse[®] SHoW Baby[®]
P/N 5900

User's Manual
Rev 1.5

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Multiverse SHoW Baby Transceivers are covered by U.S. Patent # 7,432,803 and other patents pending.

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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.

CE Mark Conformity

City Theatrical Inc. declares that this product conforms to the specifications listed in this manual, following the provisions of the European RED Directive 2014/53/EU, EMC Directive 2014/30/EU, and Low Voltage Directive 2014/35/EU:

City Theatrical Inc. vakuuttaa täten että dieses produkt tyypinen laite on direktiivin 2014/53/EU, 2014/30/EU, 2014/35/EU oleellisten vaatimusten ja sitä koskevien näiden direktiivien muiden ehtojen mukainen.

City Theatrical Inc. déclare que le produit est conforme aux conditions essentielles et aux dispositions relatives à la directive 2014/53/EU, 2014/30/EU, 2014/35/EU.

- EN 301 489-1, 301 489-18 General EMC requirements for Radio equipment
- EN 62832-1 Safety
- EN 300 328 Technical requirements for Radio equipment
- EN 55032, EN 55103-2

CAUTION— *This equipment is intended to be used in all EU and EFTA countries. Outdoor use may be restricted to certain frequencies and/or may require a license for operation. Contact local Authority for procedure to follow.*

Note: ESD precautions should be used when attaching or removing the antenna.

Note: Combinations of power levels and antennas resulting in a radiated power level of above 100 mW equivalent isotropic radiated power (EIRP) are considered as not compliant with the above mentioned directive and are not allowed for use within the European community and countries that have adopted the European R&TTE directive 2014/53/EU, 2014/30/EU, 2014/35/EU. For more details on legal combinations of power levels and antennas, contact City Theatrical Inc.

Do not use this product near water, for example, in a wet basement or near a swimming pool.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Regulatory Information

Radio Frequency Notifications

Belgique Dans le cas d'une utilisation privée, à l'extérieur d'un bâtiment, au-dessus d'un espace public, aucun enregistrement n'est nécessaire pour une distance de moins de 300m. Pour une distance supérieure à 300m un enregistrement auprès de l'IBPT est requise. Pour une utilisation publique à l'extérieur de bâtiments, une licence de l'IBPT est requise. Pour les enregistrements et licences, veuillez contacter l'IBPT.

France 2.4 GHz Bande : les canaux 10, 11, 12, 13 (2457, 2462, 2467, et 2472 MHz respectivement) sont complètement libres d'utilisation en France (en utilisation intérieur). Pour ce qui est des autres canaux, ils peuvent être soumis à autorisation selon le département.

L'utilisation en extérieur est soumise à autorisation préalable et très restreinte. Vous pouvez contacter l'Autorité de Régulation des Télécommunications (<http://www.art-telecom.fr>) pour de plus amples renseignements

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 Multiverse® SHoW Baby® is a wireless DMX transceiver that delivers breakthrough plug and play wireless DMX and RDM transmission right out of the box. In its default mode (SHoW ID 201), it is compatible with all SHoW Babys ever made, including SHoW Baby, SHoW Baby 5, and SHoW Baby 6. By connecting an RDM controller, like DMXcat® Multi Function Test Tool, all of the 147 revolutionary new 2.4GHz Multiverse SHoW IDs are accessible as well as all 70 SHoW DMX Neo SHoW IDs. Users can add Multiverse SHoW Baby to their existing SHoW Baby systems, build new single universe Multiverse systems, or use Multiverse SHoW Baby as a receiver on multiple universe systems with a Multiverse Transmitter.

The Multiverse SHoW Baby features include:

- Full compatibility with all previous SHoW Babys right out of the box
- Instant plug-and-play configuration: *For a Transmitter, connect DMX IN, for a Receiver, don't!*
- Multiverse 2.4GHz Frequency Hopping Spread Spectrum (FHSS) Radio
- Wirelessly broadcast and receive a full Universe (512 slots) of DMX
- Robust wireless DMX512 and RDM data transmission
- Six user selectable SHoW IDs accessible on the "SET ID" button, plus 147 Multiverse and 70 SHoW DMX Neo SHoW IDs accessible via RDM.
- Extremely low 4mS latency
- RDM proxy and responder functions
- Mounting bracket for installation with C-Clamp or similar hanging hardware
- Included CL2 Power Supply
- Included 2dBi omni-directional antenna
- Neutrik® 5P XLR Connectors for DMX IN and DMX OUT

Every effort has been made to anticipate your questions in this manual, but if you have any questions that are not answered here, or you want to discuss a special application, please feel free to contact us directly at: support@citytheatrical.com

Multiverse SHoW Baby Settings

The Multiverse SHoW Baby uses the Multiverse Radio Module. It is configured with six SHoW ID options for Spread Spectrum Frequency Hopping and Neo Low Latency broadcast mode. No other settings are adjustable except by RDM. The SHoW ID can be changed by pressing the small button on the back of the Multiverse SHoW Baby labeled "SET ID".

Table 1: Setting SHoW ID by Color

Color	SHoW ID	Use
Green	201	Adaptive Hopping (default selection)
Cyan	102	Full bandwidth broadcast
Magenta	117	Broadcast limited to lower end of band
White	133	Broadcast limited to middle end of band
Red	149	Broadcast limited to upper end of band
Yellow	165	Broadcast limited to area of Wi-Fi channel 14

Any other SHoW ID set by RDM not included in this table will make the ID/Data LED turn **blue**.

Multiverse SHoW Baby Antennas

The Multiverse SHoW Baby is shipped with a 2dBi omni directional antenna. Other approved antennas include the P/N 5981 Panel Antenna and the P/N 5982 Yagi Antenna. If using a 5981 Panel Antenna, you must change the antenna type to “Panel” through the RDM Settings. If using a 5982 Yagi Antenna, you must change the antenna type to “Yagi” through the RDM Settings. The 5981 and 5982 antennas require the use of a P/N 5638 Antenna Adapter Cable.

Setup and Operation

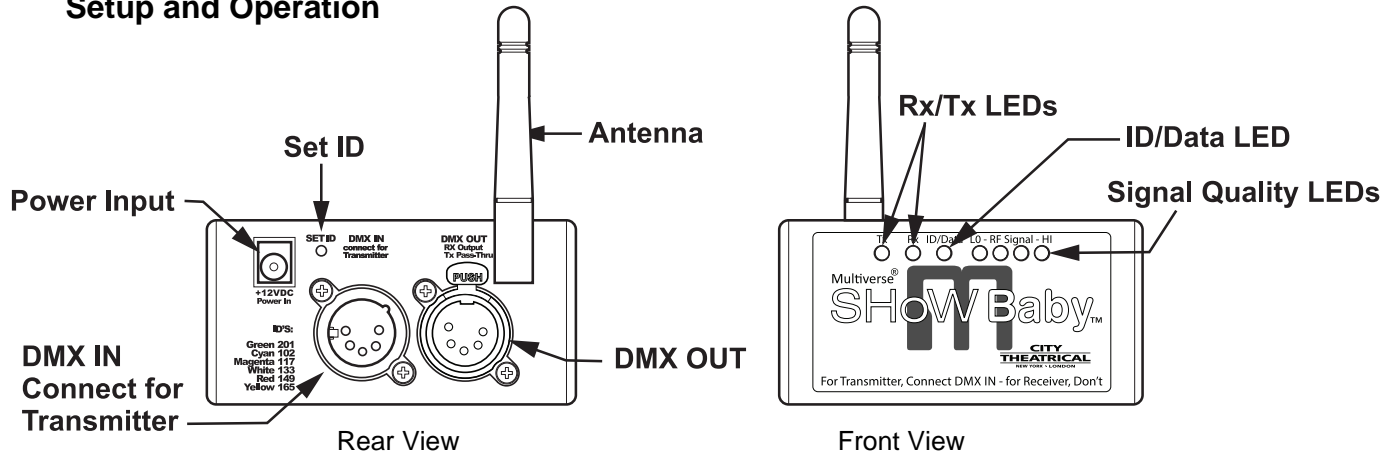


Figure 1: Multiverse SHoW Baby Front and Rear View Diagrams

A Multiverse SHoW Baby system will normally consist of at least two Multiverse SHoW Baby units.

Transmitter Setup

Although a simple Multiverse SHoW Baby system will have one transmitter and one or more receivers, you can use up to six Multiverse SHoW Baby units as transmitters set on different SHoW IDs to create a multi universe system. The following instructions describe how to set up a single universe system.

1. Install the Multiverse SHoW Baby you will use for a transmitter in a convenient location where you can reach it with the DMX cable from your console or controller. For best results, locate the unit as high in the air as possible to enable it to be clear of obstructions. Consider where you will put your Multiverse SHoW Baby receivers and place the Multiverse SHoW Baby transmitter where its antenna will be within line of sight with the receivers, if possible.
2. Install the provided antenna and point it straight up in the air.
3. Connect the provided 12V DC Power Supply to the unit, and connect to mains power.
4. Select a SHoW ID for your transmitter by choosing an ID/Data LED color using the Set ID button located on the rear next to the power jack.
5. Connect a DMX cable from the console/controller to the DMX IN. The Multiverse SHoW Baby will automatically configure itself as a transmitter and the **Tx** LED will light. The DMX IN will be automatically terminated, and the DMX OUT will be available as a DMX pass-thru. If you also connect a cable to the DMX OUT the termination is lifted.
6. As soon as you begin sending DMX from your console, the Multiverse SHoW Baby will begin broadcasting and the **Data** LED will light solid.

Receiver Setup

You will need at least one Multiverse SHoW Baby to use as a receiver.

1. Install the Multiverse SHoW Baby you will use for a receiver in a convenient location where you can reach it with a DMX cable to the device (or devices) it will be providing DMX for. As with the Multiverse SHoW Baby transmitter, locate the unit higher in the air for best results, and try to place your Multiverse SHoW Baby receiver where its antenna will be within line of sight with the transmitter.
2. Install the provided antenna and point it straight up in the air.
3. Connect the provided 12V DC Power Supply to the unit, and connect to mains power. The Multiverse SHoW Baby will be configured as a receiver and the **Rx** LED will light.
4. Select a SHoW ID by matching the ID/Data LED color to that of the transmitting Multiverse SHoW Baby you wish to receive DMX data from by using the button located on the rear of the unit next to the power jack. Transmitter and receiver SHoW ID colors must match for them to communicate.
5. Connect a DMX cable from the Multiverse SHoW Baby DMX OUT to the first DMX device you want to provide DMX to. You can then continue to add devices to up to a total of 32 DMX devices in the chain. Like any other DMX system, be sure the last connected device in the chain is properly terminated.
6. As soon as you begin broadcasting from the Multiverse SHoW Baby set up as your transmitter, the data will be received by the SHoW Baby(s) 6 set up as receiver(s) and the transmitted DMX will be output from the receiver unit's DMX OUT. The received signal quality will be displayed on the four **LO – RF Signal – HI** LEDs. This four LED "meter" will light to show you your signal quality; a high quality wireless signal is three or more LEDs, and lower quality signal is two or less.

You can set up any number of additional Multiverse SHoW Baby units as receivers.

RDM Operation

Multiverse SHoW Baby is fully enabled as an RDM proxy system, so you can use RDM to manage your Multiverse SHoW system and any connected RDM responders that are downstream of the system.

In order to use RDM, you will also need an RDM controller such as the DMXcat Multi Function Test Tool or a lighting control console with a built-in RDM controller.

Multiverse SHoW Baby Advanced Setup

Besides the six SHoW IDs settable via the "Set ID" button on the back of the SHoW Baby, all SHoW DMX Neo SHoW IDs (70) and all Multiverse 2.4GHz SHoW IDs (147) are accessible with any RDM controller, such as DMXcat®. When set to a SHoW ID not listed in Table 1, the ID/Data LED will become blue.

Using Multiverse SHoW IDs enables the use of additional Multiverse features such as Forward Error Correction, mDMX (lower radio energy), and improved RDM performance, as well as allowing the Multiverse SHoW Baby to serve as a receiver on a system with a Multiverse Transmitter or Multiverse Node. **(Note: Multiverse SHoW Baby is compatible with Multiverse Transmitter P/Ns 5910 and 5911 when used with a Multiverse SHoW ID on the 2.4GHz band.)** See Table 4: Multiverse SHoW IDs on page 12 for more information about the additional SHoW DMX Neo or Multiverse SHoW IDs.

Using an RDM controller like a DMXcat allows access to several other Multiverse SHoW Baby features:

- **SHoW ID**
All available Multiverse or SHoW DMX Neo SHoW IDs can be entered here. Default is 201.
- **Output Power**
Output power may be user selected as Low, Med, Hi, or Maximum. It is a best practice to use the least amount of output power to achieve a successful show. This helps to reduce reflections which can reduce signal fidelity and to reduce any potential negative effect on other radio users in the area. You can monitor signal strength via RDM. Default is Maximum.
- **Auto-Off/Sleep Timer (Minutes)**
When used as a Transmitter, the Multiverse SHoW Baby can be made to go to sleep when the presence of DMX or RDM is no longer sensed. It will wake up again when DMX or RDM is sensed. This setting is needed when used as a transmitter in a system using ETC ColorSource Relays. Default is 0 (off).
- **RDM Traffic**
The RDM Traffic setting determines whether RDM data is passed downstream of the Multiverse SHoW Baby. It does not affect whether the Multiverse SHoW Baby is detectable by devices upstream. It is recommended that RDM be turned off before production situations as many DMX devices do not correctly handle RDM data and may exhibit flickering or other undesired behavior. Default is Off.
- **Antenna Selection**
If a panel (P/N 5981) or Yagi (P/N 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. An (P/N 5638) adapter cable is required to use a panel or Yagi antenna.
- **SHoW Key Security (Multiverse SHoW IDs only)**
The SHoW Key setting allows a user to enter a key to privatize their SHoW ID from another system on the same SHoW ID. SHoW IDs and SHoW Keys need to match in order for receivers and transmitters to talk to each other. Keeping your SHoW Key private will provide a level of security to your Multiverse system from unauthorized use. It is not recommended to use different SHoW Keys in a system that uses multiple Multiverse SHoW Babys as Transmitters on the same SHoW ID. The range is 0 (Default) to 500.

Table 2: SHoW IDs and SHoW Keys

Situation		Condition	Outcome
Same SHoW Key	with	Different SHoW IDs	OK
Different SHoW Keys	with	Same SHoW IDs	Not OK
Different SHoW Keys	with	Different SHoW IDs	OK

- **Forward Error Correction (Multiverse SHoW IDs only)**
High noise environments can affect wireless DMX performance. Enabling Error Correction adds additional information to the data packets to correct errors in slot data that would have otherwise been lost, restoring DMX delivery back to near perfect levels. 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** (Multiverse SHoW IDs only)
Improves fidelity while dramatically reducing radio energy broadcast into the spectrum. Only needs to be set at the Transmitter. Default is on.

Specifications

Table 3: Physical Characteristics

Product Information	
Product Name	Multiverse SHoW Baby
Part Number	5900
Maximum Concurrent Universes	1
Frequency Range:	2400 – 2480 MHz

Physical Specifications	
Length	92mm (3.625 in)
Width	76mm (3.00 in)
Height	46mm (1.80in)
Weight	0.16 Kg (0.35 lb)
Construction	Steel, ABS plastic, Black

Connection Specifications	
*DC Jack, 5.5mm x 2.1mm barrel, center positive, 9mm mating depth	
Neutrik® 5-Pin XLR connectors for DMX512 IN and OUT/thru ports	
RP-SMA female antenna connector	
USB Type-A port, internal (requires removing cover and circuit board)	

Functionality	
User Interface	1 Button/LEDs
RDM Features	RDM Proxy, RDM Responder

Power	
Input Power	7.5-30VDC, 0.8W
Max Draw	66mA max draw at 12V
AC Adapter Voltage	100VAC to 240VAC 50/60Hz

Radio Technology	
Latency	4 ms average
RF Sensitivity	-95dBm
Loss of Data Behavior	Output stops
Broadcast Power	2.5mW, 8mW, 25mW, 80mW EIRP
Broadcast Modes	Adaptive, Full, Low, Mid, High, Max
Show IDs	217 (Americas and Worldwide)

Product Information	
Use Environment	Indoor
Operating Temperature	0° C to 40° C
Storage Temperature	-40° C to 85° C
IP Rating	IP50
Compliance	FCC, IC, CE, ARIB, RoHS
Warranty	One year

*Note: This power supply connector is not compatible with Multiverse Node.

Installing the Mounting Bracket

The Multiverse SHoW Baby is provided with a Mounting Bracket for use with ½" theatrical mounting hardware like a C-Clamp.

Mount the Bracket on the Multiverse SHoW Baby using the three provided 8-32 x ½" pan head Philips screws.



Figure 2: Attaching the Mounting Bracket

What's Included



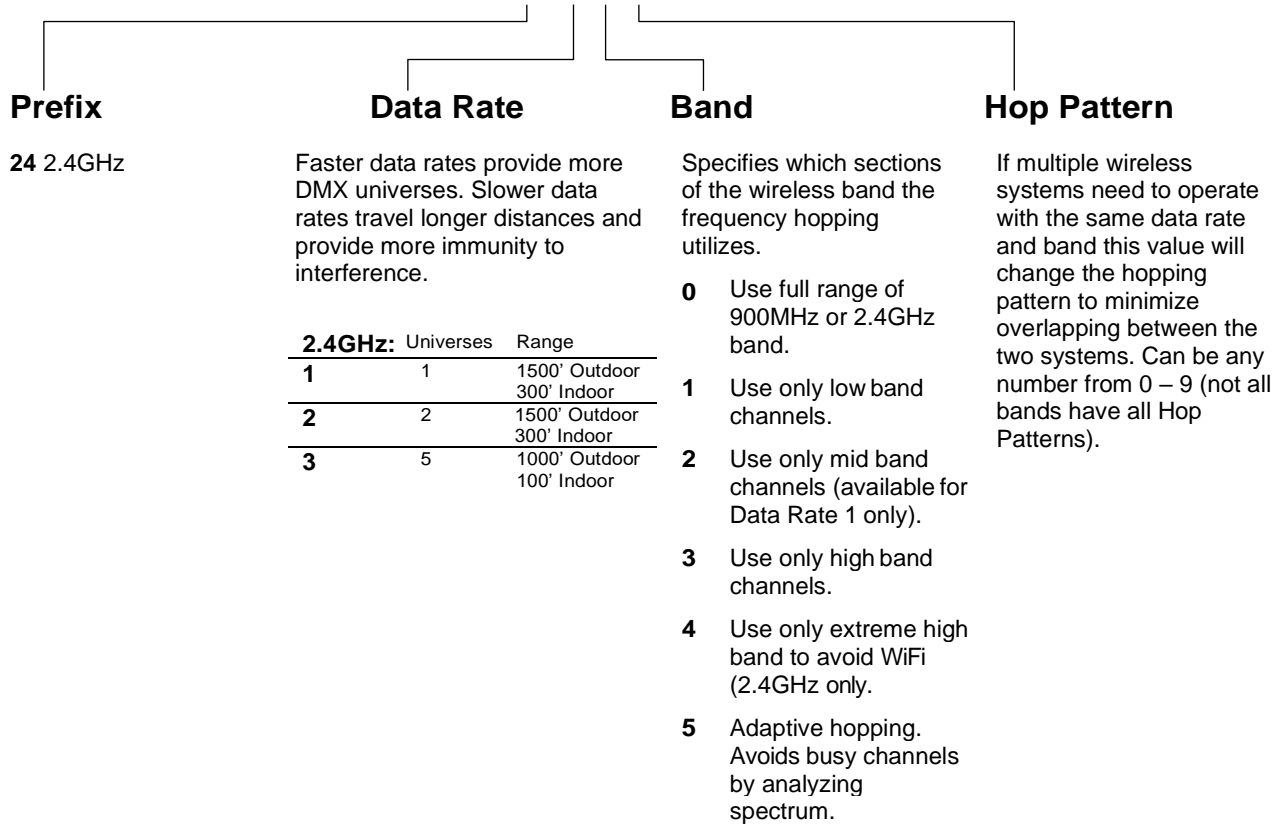
Figure 3: What's Included

Table 3: Included Item Descriptions and Part Numbers

Label in Figure 3	Item Description	Part Number
1	Multiverse SHoW Baby Transceiver	5900
2	Mounting Plate with hardware	5602
3	12VDC Power Supply with plug kit	5627
4	2dBi Omni, 2.3" Multiverse Antenna	5729

Table 4: Multiverse SHoW IDs

Multiverse SHoW ID Example: **24302**



Note: Not all combinations of digits are possible and unused numbers are reserved for future use.

Table 5: SHoW DMX Neo SHoW IDs for Use with Multiverse SHoW Baby

SHoW ID	Mode	Hopping Pattern	Bandwidth
101	Neo	1	Full
102	Neo	2	Full
103	Neo	3	Full
104	Neo	4	Full
105	Neo	5	Full
106	Neo	6	Full
107	Neo	7	Full
108	Neo	8	Full
109	Neo	9	Full
110	Neo	10	Full
111	Neo	11	Full
112	Neo	12	Full
113	Neo	13	Full
114	Neo	14	Full
115	Neo	15	Full
116	Neo	16	Full

SHoW ID	Mode	Hopping Pattern	Bandwidth
117	Neo	1	Limited Low, Wi-Fi 1-6
118	Neo	2	Limited Low, Wi-Fi 1-6
119	Neo	3	Limited Low, Wi-Fi 1-6
120	Neo	4	Limited Low, Wi-Fi 1-6
121	Neo	5	Limited Low, Wi-Fi 1-6
122	Neo	6	Limited Low, Wi-Fi 1-6
123	Neo	7	Limited Low, Wi-Fi 1-6
124	Neo	8	Limited Low, Wi-Fi 1-6
125	Neo	9	Limited Low, Wi-Fi 1-6
126	Neo	10	Limited Low, Wi-Fi 1-6
127	Neo	11	Limited Low, Wi-Fi 1-6
128	Neo	12	Limited Low, Wi-Fi 1-6
129	Neo	13	Limited Low, Wi-Fi 1-6
130	Neo	14	Limited Low, Wi-Fi 1-6
131	Neo	15	Limited Low, Wi-Fi 1-6
132	Neo	16	Limited Low, Wi-Fi 1-6

SHoW ID	Mode	Hopping Pattern	Bandwidth
133	Neo	1	Limited Mid, Wi-Fi 5-9
134	Neo	2	Limited Mid, Wi-Fi 5-9
135	Neo	3	Limited Mid, Wi-Fi 5-9
136	Neo	4	Limited Mid, Wi-Fi 5-9
137	Neo	5	Limited Mid, Wi-Fi 5-9
138	Neo	6	Limited Mid, Wi-Fi 5-9
139	Neo	7	Limited Mid, Wi-Fi 5-9
140	Neo	8	Limited Mid, Wi-Fi 5-9
141	Neo	9	Limited Mid, Wi-Fi 5-9
142	Neo	10	Limited Mid, Wi-Fi 5-9
143	Neo	11	Limited Mid, Wi-Fi 5-9
144	Neo	12	Limited Mid, Wi-Fi 5-9
145	Neo	13	Limited Mid, Wi-Fi 5-9
146	Neo	14	Limited Mid, Wi-Fi 5-9
147	Neo	15	Limited Mid, Wi-Fi 5-9
148	Neo	16	Limited Mid, Wi-Fi 5-9

SHoW ID	Mode	Hopping Pattern	Bandwidth
149	Neo	1	Limited High, Wi-Fi 7-11
150	Neo	2	Limited High, Wi-Fi 7-11
151	Neo	3	Limited High, Wi-Fi 7-11
152	Neo	4	Limited High, Wi-Fi 7-11
153	Neo	5	Limited High, Wi-Fi 7-11
154	Neo	6	Limited High, Wi-Fi 7-11
155	Neo	7	Limited High, Wi-Fi 7-11
156	Neo	8	Limited High, Wi-Fi 7-11
157	Neo	9	Limited High, Wi-Fi 7-11
158	Neo	10	Limited High, Wi-Fi 7-11
159	Neo	11	Limited High, Wi-Fi 7-11
160	Neo	12	Limited High, Wi-Fi 7-11
161	Neo	13	Limited High, Wi-Fi 7-11
162	Neo	14	Limited High, Wi-Fi 7-11
163	Neo	15	Limited High, Wi-Fi 7-11
164	Neo	16	Limited High, Wi-Fi 7-11
165	Neo	1	Max, Wi-Fi 13-14
166	Neo	2	Max, Wi-Fi 13-14

SHoW ID	Mode	Universe	Bandwidth
201	Neo Adaptive	A	Full
202	Neo Adaptive	B	Full
203	Neo Adaptive	C	Full
204	Neo Adaptive	D	Full

Table 6: Troubleshooting Guide

SHoW DMX Neo SHoW IDs

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 matches on transmitters and receivers.

Multiverse SHoW IDs

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.