The Advanced Features of SHoW DMX Neo™

Another new generation of Custom-Built Radio

City Theatrical was an early adopter of wireless DMX distribution with our award-winning WDS system. We realized the next generation of wireless DMX equipment needed to be custom-tailored to meet the specific requirements of a wireless DMX system, so in 2008 we launched SHoW DMX®, a purpose-built radio system with many advanced features that were specifically designed just to broadcast and receive DMX/RDM data.

Today, as the wireless DMX world has expanded, new conditions and challenges have emerged, and CTI's continuous research and development has produced **SHoW DMX Neo™**, a new generation of purpose-built wireless SHoW DMX® technology that builds on the features of SHoW DMX with a whole new suite of additional features that provide even more tools for creating a wireless DMX system that is flexible, accurate, reliable, and plays well with others!

SHoW DMX Neo means <u>User</u> Configuration

The SHoW DMX Neo wireless DMX system provides many advanced tools to allow the wireless system to be matched to the venue's physical features, other show wireless systems in use, the RF environment, and show-specific wireless DMX requirements. Each of these advanced tools is completely *user-configurable*. That means you can set up your SHoW DMX system in the

way that delivers the best possible wireless Data, while causing the least possible interference with the rest of the wireless systems on the show. The system doesn't decide, *you do!*

SHoW DMX Neo means transparent and universal RDM functionality

SHoW DMX Neo provides fully functional RDM Proxy and RDM Responder operations with any RDM controller, and will provide fast and effective communication with any PLASA compliant RDM device, including all RDM Controllers and Responders. CTI works closely with the RDM community to assure that SHoW DMX Neo continues to play well with others in the RDM world as well as the wireless world.

New SHoW DMX Neo Radio Technology Features

Three User Selectable Broadcast Modes

SHoW DMX Neo Mode

- DMX Synchronized Hopping
- Ultra Low Latency
- User selectable Full or Limited Bandwidth
- User selectable Full or Limited Burst
- User selectable Output Power
- Lost Data Replacement
- Advanced High Speed RDM functions
- Supports reduced DMX slot frames for higher refresh rates

SHoW DMX Neo Adaptive Mode

- DMX Synchronized Hopping
- Adaptive Frequency Hopping
- Ultra Low Latency
- Adaptive Modified Full Bandwidth
- User selectable Output Power
- Lost Data Replacement
- Advanced High Speed RDM functions
- Supports reduced DMX slot frames for higher refresh rates

SHoW DMX Classic Mode

- Communicates with original SHoW DMX equipment
- DMX Synchronized Hopping
- User selectable Full or Limited Bandwidth
- User selectable Full or Limited Burst
- User selectable Output Power

Ultra Low Latency

- Total system latency of 7mS or less

User Selectable Adaptive Spread Spectrum Frequency Hopping

- Adaptive Spread Spectrum Frequency Hopping identifies and masks off hopping channels with interference, replacing them in the hop sequence with alternate channels

- Turn on adaptive hopping if you choose to and broadcast up to four DMX universes

Lost Data Replacement

- "Heals" incomplete DMX packets with recent data

Advanced High Speed RDM Functions

- Works with all PLASA Compliant RDM Controllers and Responders
- New RDM functionality provides fast System Discovery and Responder communication
- RDM can be turned on or off quickly from any RDM Controller

SHoW DMX Classic or SHoW DMX Neo Mode Selection

- Choose from the full array of SHoW DMX Neo and SHoW DMX Classic configuration options to achieve the best possible system setup
- User configurable to communicate with all versions of SHoW DMX Transmitters and Receivers

New SHoW DMX SHoW IDs

- SHoW IDs 1-64: SHoW DMX Classic
- SHoW IDs 101-164: SHoW DMX Neo
- SHoW IDs 201-204: SHoW DMX Neo Adaptive

SHoW DMX Classic Radio Technology Features

Optimized High-Speed Wireless Data Transmission

The SHoW DMX Transceiver's high-speed through-air data structure has been optimized for wireless DMX delivery so that the system is utilized as efficiently as possible. This allows the system to broadcast two complete copies of each DMX packet it receives.

DMX Synchronized Hopping (Patent Pending)

CTI's proprietary system synchronizes the DMX frame rate to match the FHSS hopping period preventing fragmentation of the DMX slot information and maintain predictable latency timing.

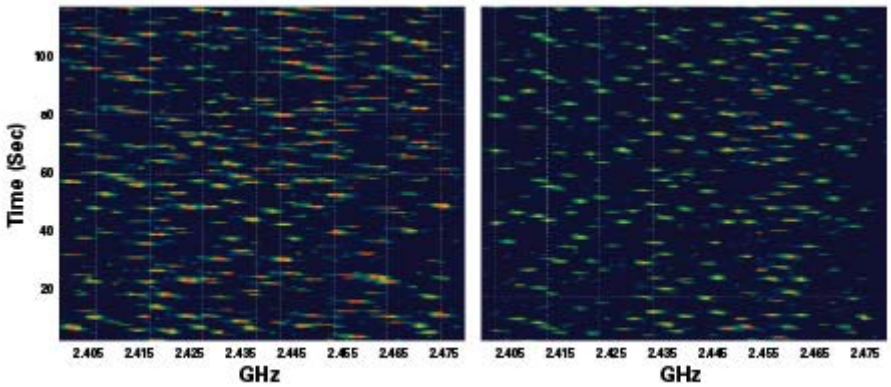
Refresh Rate Compensation

Many conventional wireless DMX systems output DMX data from their receivers at a constant speed. This means that if the console refresh rate is slower than the wireless system refresh rate, the wireless system has to make extra copies of some of the DMX packets, while if the console is faster than the wireless system, the wireless system will lose packets. CTI's SHoW DMX is so fast that no DMX packets need be discarded, and SHoW DMX also adjusts its output to mimic the refresh rate of consoles that run slower than full speed. This means that you get the DMX packets out of SHoW DMX that you put in, no more, no less.

Adjustable Output Power

Sometimes an application calls for the most available broadcast power, but most entertainment systems do not need the full power of the SHoW DMX Neo Transceiver. In Fact, many Broadway shows have used 10mW Transmitters for their wireless DMX systems.

The broadcast power of the CTI SHoW DMX Transceiver is adjustable to allow the user to calibrate the system's broadcast power to match the requirements of the venue. This means that for very long range applications the Transceiver can be dialed up to the maximum level, while for places where more than one system is likely to be used in relatively close proximity, or where SHoW DMX is being used in the same environment with other more vulnerable wireless systems (e. g. WiFi), a lower power setting can be used. Adjustable output power can be coupled with SHoW DMX's other advanced features to provide the "greenest", smallest radio footprint available in wireless DMX delivery, while also offering the highest possible fidelity and the robust, reliable performance of FHSS Technology.



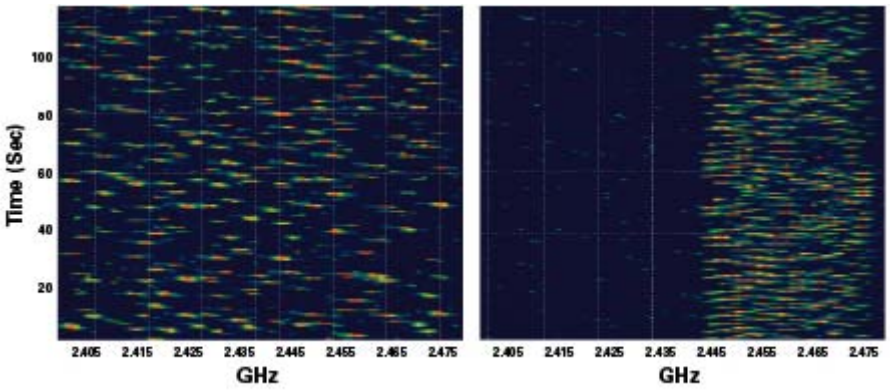
The Wi-Spy screen shots above show higher power in the left screen and lower power in the right screen. Redder, denser dots indicate higher power

Full Bandwidth Hopping

SHoW DMX offers more than one kind of user-selectable FHSS hopping mode. In full bandwidth hopping mode, the system will continuously hop across the full 2.4Ghz spectrum, providing the most robust and interference-immune delivery mode available. The system supports 16 different full bandwidth hopping patterns, which can be used at any power setting, allowing a number of separate systems to broadcast multiple DMX Universes in the same venue or setting.

Limited Bandwidth Hopping

In the Limited Bandwidth Hopping mode, the SHoW DMX system is assigned to one of three sub-bands of the full 2.4Ghz spectrum. Each sub-band occupies approximately 2/5s of the full band, with one sub-band positioned at the low end, one in the center, and one at the high end of the full spectrum. The three sub-bands overlap and each avoids some combination of WiFi channels. This will allow the SHoW DMX Transceiver to be set to broadcast in a different area of the spectrum than other equipment being used in the area, to minimize or eliminate interference with WiFi or other channel specific or limited bandwidth equipment.



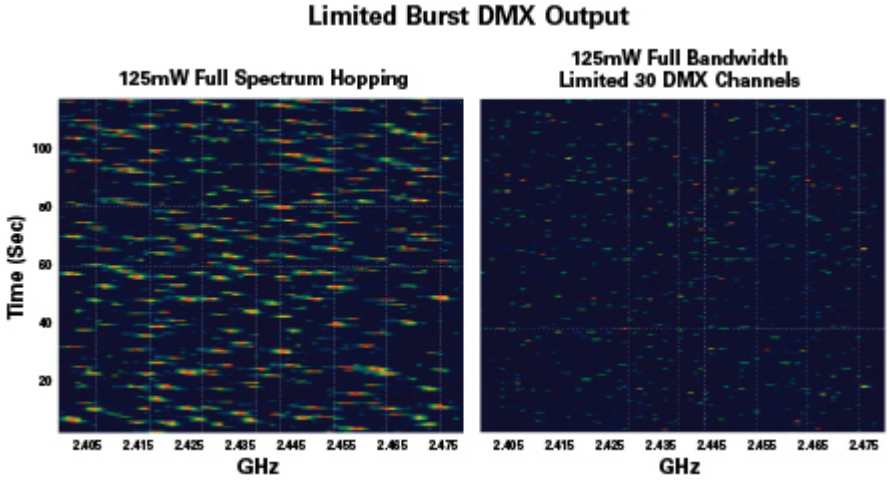
In these Wi-Spy screen shots, the effect of limiting the SHoW DMX bandwidth to WiFi bands 7-12 is clearly shown. In the right hand screen, the portion of the spectrum below 2.466GHz is nearly devoid of activity. Other Wi-Fi signals could operate freely in that area.

Limited Burst DMX Output

Limited Burst mode reduces the number of DMX channels and the amount of radio energy that is broadcast by the SHoW DMX Transceiver.

If you don't need all 512 DMX values and you need to control the radio energy in your system as much as possible, then you can use Limited Burst to target only the DMX channels you need, and reduce your radio footprint even further.

In Limited Burst mode, the user may select any contiguous group of 32/52 (Classic/Neo) or more DMX values in multiples of 32/52 values. These may be assigned to any starting address that will accommodate the burst.



In these screen shots it can be seen that while operating at full power, but limited to an output of 30 DMX channels, SHoW DMX has a very small radio footprint. Some shows don't require all 512 channels to be broadcast via wireless, and this is an excellent option to reduce radio interference with other users in the same venue

A new SHoW DMX Neo Transceiver

The new 5701 SHoW DMX Neo Transceiver offers an array of new and classic SHoW DMX features:

- Certified for use in North America and all CE Countries
- All SHoW DMX Neo wireless DMX features
- All SHoW DMX Classic wireless DMX features, configurable to work with all existing SHoW DMX systems
- Fast and reliable wireless RDM Proxy and Responder functions
- City Theatrical's advanced built-in Ethernet Gateway features:
    - Dual Ethernet Ports
    - Supports multiple Ethernet show control protocols including sACN, Art-Net, and KiNet
- Fully configurable wireless DMX/RDM Transceiver, configure as a transmitter or receiver
- USB port for easy firmware upgrades

A new SHoW DMX Neo Receiver

The new 5711 SHoW DMX Neo Receiver is equally powerful:

- Certified for use in North America and all CE Countries
- All SHoW DMX Neo wireless DMX features
- All SHoW DMX Classic wireless DMX features, configurable to work with all existing SHoW DMX systems
- Fast and reliable wireless RDM Proxy and Responder functions
- Universal Mains (100-240 VAC 50/60 Hz) or 12VDC CL 2 Power (using optional adapter or batteries)
- USB port for easy firmware upgrades