

Application Note

Input/output expansion of MXE Matrix Mix Engines via the MXE OMNEO Dante OCA network interface using RDL (Radio Design Labs) Dante panels

MXE Matrix Mix Engines are equipped with an *OMNEO Dante OCA* network interface for interfacing to other systems, using an Ethernet network.



Image 1: MXE rear view

The network interface (OMNEO Dante OCA) can be found on the MXE's rear panel. It offers three network ports in total: CONTROL, PRIMARY and SECONDARY.

CONTROL	PR MARY	SECONDARY
11 11		
- OMNE	O Dante	0C4

Image 2: MXE network interface detail view

The MXE network interface can be configured in three different modes:

- Transparent: all three ports on the same internal VLAN
 o For simple star or line network topologies
- **RSTP:** all three ports on the same internal VLAN, RSTP protocol active
 - For direct integration into ring or mesh network topologies running in RSTP mode
- **Glitch-Free:** CONTROL and PRIMARY on the same, SECONDARY on a separate internal VLAN
 - For integration to OMNEO or Dante networks based on separate Primary and Secondary networks

The *CONTROL* port offers a built-in multicast filter and thus optimized for control purposes.

Requirements

MXE Matrix Mix Engine with firmware 1.0.2470 (or higher)

SONICUE Sound System Software 1.2 EA (or higher) installed on computer

Manageable PoE Ethernet switch fulfilling the minimum OMNEO and Dante requirements

CAT5e or better Ethernet (patch) cables



RDL Dante panels (3rd party)

RDL's Dante panels are designed as "problem solvers" if inputs or outputs are needed in certain rooms or zones that could more easily be integrated via a network, rather than by installing analog audio cables. Also in cases where the number of analog inputs or outputs of an MXE needs to be increased, or if Bluetooth® connectivity is required, these panels are a very good solution.

Generally, having local zone inputs and outputs connected via a Dante network gives more freedom for changes to the system configuration in the future.

All panels come in a range of colors, typically in white, black or stainless. Please refer to the RDL website for more information.

The following RDL Dante panels have been successfully tested with MXE:

- DDS-BN22 (stainless) Wall-Mounted Bi-Directional Mic/Line Dante Interface 2x2
 Variants DDB-BN22 (black), DD-BN22 (white)
- DD-BTN44 (white) Wall-Mounted Bi-Directional Line-Level and Bluetooth® Audio Dante Interface
 - Variants DDB-BTN44 (black), DDS-BTN44 (stainless)



RDL DD SERIES-BN22 Wall-Mounted Bi-Directional Mic/Line Dante Interface 2x2

Product images



Image 3: DD-BN22 variants and rear view (top right)

Brief description and application example

The DD-BN22 can be used to extend the number of analog input and output channels of an MXE or to add local analog audio inputs and outputs to a system directly, where they are needed in an installation.

It offers two analog XLR inputs that are converted to Dante network channels and can then be sent to a MXE or other Dante-enabled product via Dante network. In addition, it offers two analog XLR outputs that can receive signals via Dante network, which are then converted to analog.

Both inputs and outputs can be set to either mic or line level. The microphone inputs offer studio-quality microphone preamplifiers with switch-selectable mic gain and 48 V mic phantom power.

As all settings (gain, level and phantom power) are made via hardware switches on the panel, no special software is required for module setup.

As the DD-BN22 is powered via PoE, no separate power supply is required.



For further details, please study the datasheet (dd-series-bn22.pdf) which is available on the RDL website.

Basic set up – network connection

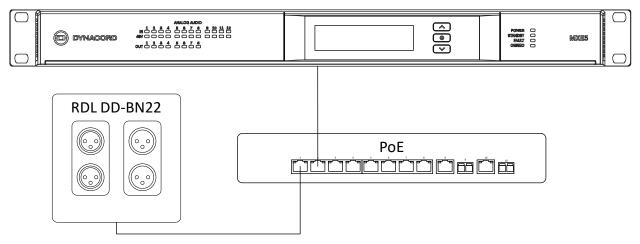


Image 4: DD-BN22 connection to MXE via PoE Ethernet switch

Basic set up – software configuration



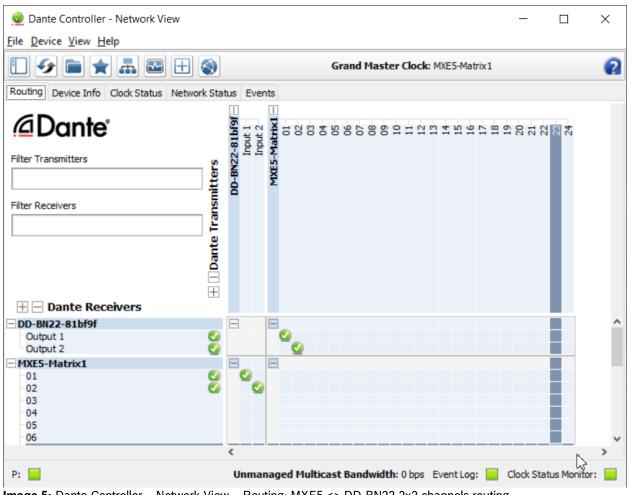


Image 5: Dante Controller – Network View – Routing: MXE5 <> DD-BN22 2x2 channels routing



RDL DD SERIES-BTN44 Wall-Mounted Bi-Directional Line-Level and Bluetooth® Audio Dante Interface

Product images



Image 6: DD-BTN44 variants and rear view (top right)

Brief description and application example

The DD-BTN44 can add Bluetooth® and analog consumer audio connectivity to a MXE and simultaneously increase the number of MXE inputs and outputs.

It offers a stereo Bluetooth® input and a stereo analog input with mini headphone / RCA jacks. These inputs are converted to Dante network channels and can then be sent to a MXE or other Dante-enabled product via Dante network. Besides it offers a mono Bluetooth® output, a stereo analog output with mini headphone jack and a mono balanced/unbalanced analog output on the rear panel, which can be used for example to drive a local zone amplifier. These outputs can receive signals via Dante network, which are then converted to analog or Bluetooth®.

Both the Bluetooth® and analog audio inputs can be summed to a mono signal via a hardwareswitch. No special software is required for module setup.

As the DD-BTN44 is powered via PoE, no separate power supply is required.

For further details, please study the datasheet (dd-series-btn44.pdf) which is available on the RDL website.



Basic set up – network connection

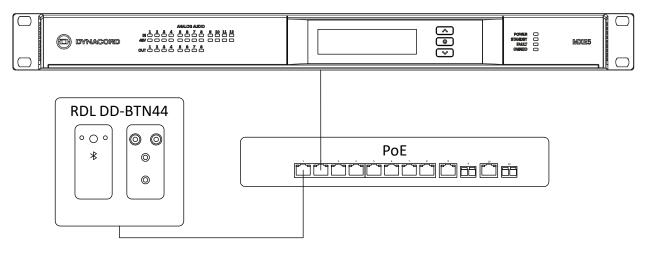


Image 7: DD-BTN44 connection to MXE via PoE Ethernet switch

Basic set up - software configuration

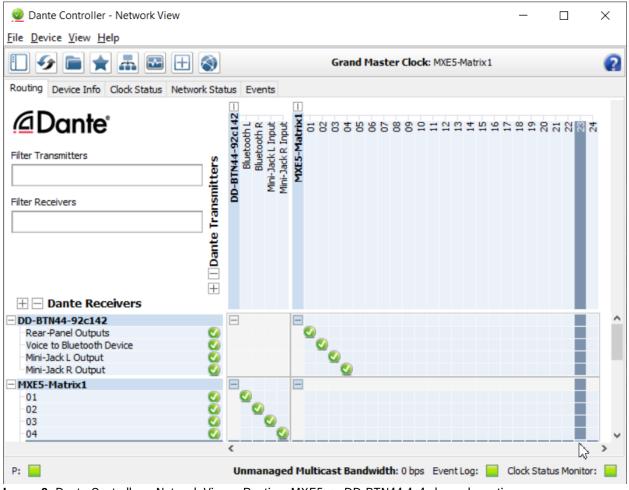


Image 8: Dante Controller – Network View – Routing: MXE5 <> DD-BTN44 4x4 channels routing



General compatibility and options

Dante Sample Rate

The Dynacord MXEs offer 48 and 96 kHz sample rate, whereas the RDL Dante panels offer 44.1 and 48 kHz sample rate. This means to achieve sample rate compatibility all units in a combined system must be set to 48 kHz.

🙋 Dante Controller - Device View (DD-BN22-81bf9f)	—	\times
File Device View Help		
✓ () • < () ✓ DD-BN22-81bf9f ∨		?
Receive Transmit Status Latency Device Config Network Config AES67 Config		
Rename Device		
Sample Rate: 48k V Pull-up/down: NONE V 44, 1k 48k		
[Encoding Clocking		
Preferred Encoding: PCM 24 Unicast Delay Requests: Disabled This device does not support preferred encoding configuration.		
Device Latency		
Latency: 1,0 msec 🗸		
Reset Device Reboot Clear Config		
Image 9: Dante Controller – Device View – Device Config: DD-BN22 Sample Rate selection		



Dante Latency

The *Device Latency* of both RDL Dante panels can be set to either 1.0 msec, 2.0 msec or 5.0 msec.

Dante Controller - Device View (DD-BN22-81bf9f)	_	×
File Device View Help		
		?
Receive Transmit Status Latency Device Config Network Config AES67 Config		
Rename Device DD-BN22-81bf9f Apply		
Sample Rate	_ _	
Sample Rate: 48k V Pull-up/down: NONE V		
Encoding Clocking		
Preferred Encoding: PCM 24 Unicast Delay Requests: Disabled V This device does not support]	
preferred encoding configuration.		
Latency: 1,0 msec		
Reset Device 2,0 msec Reboot 5,0 msec ear Config		
Image 10: Dante Controller – Device View – Device Config: DD-BN22 Latency selection		



Network interface bandwidth

The MXE can appear in the Dante Controller with either just a *Primary* port (Transparent and RSTP modes) or with *Primary* and *Secondary* ports (Glitch-Free mode).

The MXE's network interface ports are all 1 Gbps, whereas the RDL Dante panels' single network port is 100 Mbps.

			Gr	and Master C	lock: MXE5-Matrix1			0
					Den Files Fisting			
Routing Device Info	Clock Statu	s Network Status Events						
Device Name	Product Type	Product Version	Dante Version	Device Lock	Primary Address	Primary Link Speed	Second	
DD-BN22-81bf9f	DD-BN22	1.1.1	4.1.4.2		169.254.160.191	100Mbps	N/A	,
DD-BTN44-92c142	D-BTN44	1.1.1	4.1.4.2		169.254.67.193	100Mbps	N/A	
MXE5-Matrix1	MXE5	OMNEO7.01.8012 P7.1.8012	4.2.0.4		169.254.112.235	1Gbps		
								•
(3	>

Image 12: Dante Controller - Network View - Device Info: MXE5, DD-BN22 and DD-BTN44 connected

This requires the configuration of IGMP snooping in larger systems, as otherwise the RDL Dante panels' network ports might be overloaded with multicast (audio) data packets.

Clock settings

Both the MXE and RDL Dante panels can be set as *Preferred Master*.

SVDC Mute	6		ix1	c: MXE5-Matr	nd Master Clock	Gra		3			1 😏 🖬 🖠
Name Sync Mute Source Status Status Status Status Master To External DD-BN22-81bf9f Dante N/A Slave N/A N/A N/A							Events	work Status	tatus Net	Clock S	Routing Device Info
		Enable Sync To External							Mute	Sync	
DD-BTN44-92c142 Dante N/A Slave N/A N/A N/A		N/A		N/A	N/A	Slave	N/A	Dante			DD-BN22-81bf9f
		N/A		N/A	N/A	Slave	N/A	Dante			DD-BTN44-92c142
MXE5-Matrix1 Dante N/A Master Link down Disabled 🗹			\checkmark	Disabled	Link down	Master	N/A	Dante			MXE5-Matrix1

Image 13: Dante Controller - Network View - Clock Status: MXE5, DD-BN22 and DD-BTN44 connected

However, as the RDL Dante panels will always be endpoints in a network and the MXE can be in the center of a network, the MXE should be set as Preferred Master. Especially in very small networks this is not necessary and the user can rely on the Dante network to automatically choose the best available clock.



Additional test system screenshots

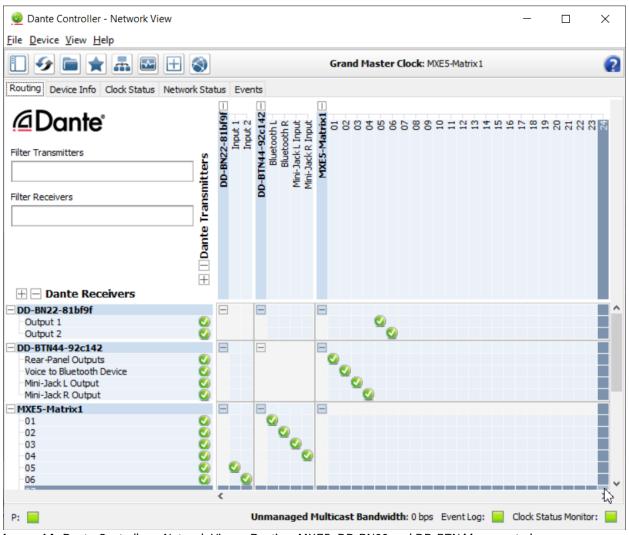


Image 14: Dante Controller - Network View - Routing: MXE5, DD-BN22 and DD-BTN44 connected

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🗉 🥩 💼 y	k 🛲 🖾 (± 🕥		Grand	Master Clock: N	MXE5-Matrix1		(G
Routing Device Info	Clock Status	letwork Status	Events						
Device Name	Subscription Status	Primary Status	Secondary Status	Primary Tx B/W	Secondary Tx B/W	Primary Rx B/W	Secondary Rx B/W	Latence	
DD-BN22-81bf9f	0	100Mbps	N/A	3 Mbps		4 Mbps		1 msec	,
DD-BTN44-92c142	0	100Mbps	N/A	5 Mbps		6 Mbps		1 msec	
MXE5-Matrix1	9	1Gbps	Link down	9 Mbps		9 Mbps		1 msec	
									•
C								>	

Image 15: Dante Controller – Network View – Network Status: MXE5, DD-BN22 and DD-BTN44 connected



Dynacord does not take responsibility for the warranty, quality or availability of RDL products. The RDL products contained within this document were tested successfully at the time of publication. However, Dynacord cannot guarantee the compatibility with future models or variations of RDL products, as these may not be compatible. Please refer to the RDL website for product specific information.