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.

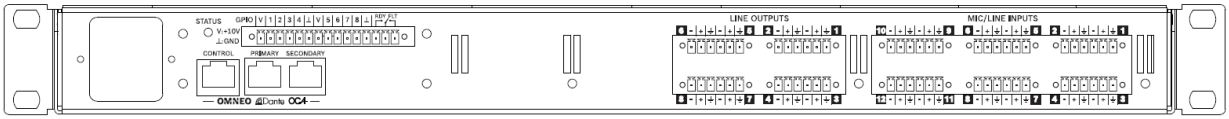

Image 1: MXE rear view

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*.

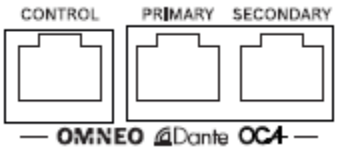

Image 2: MXE network interface detail view

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

- **Transparent:** all three ports on the same internal VLAN
  - 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

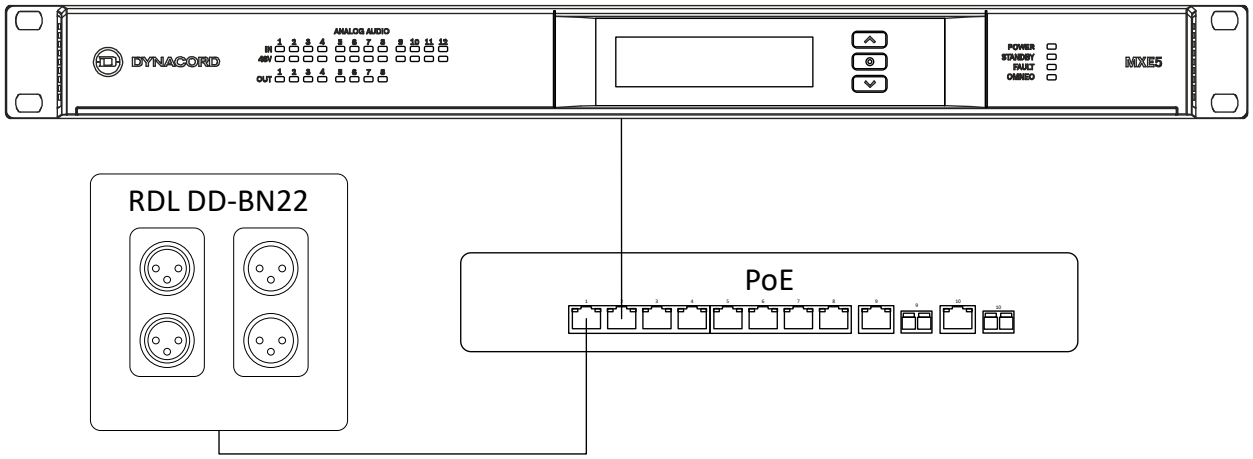

Image 4: DD-BN22 connection to MXE via PoE Ethernet switch

Basic set up – software configuration

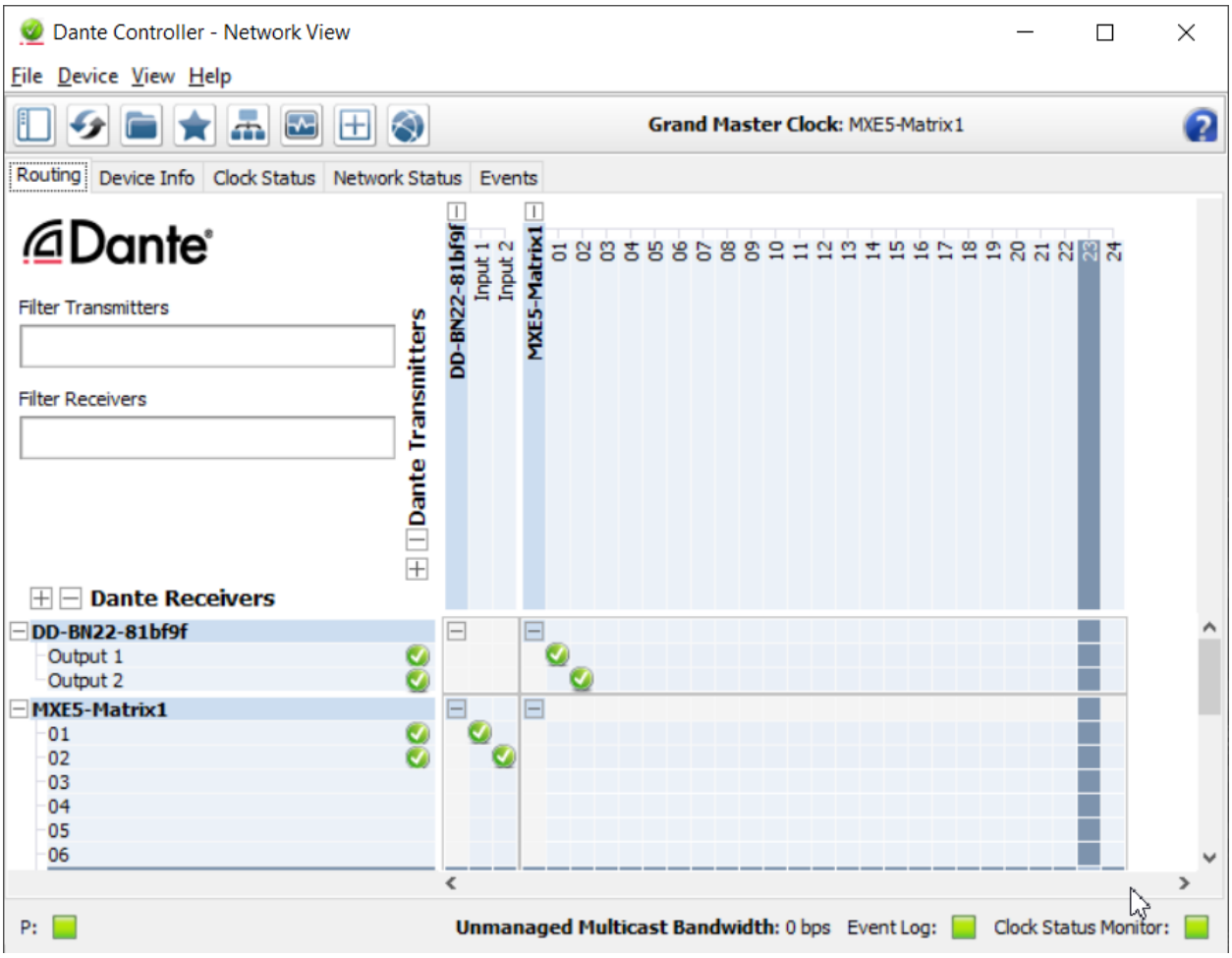

Image 5: Dante Controller – Network View – Routing: MXE5 <> DD-BN22 2x2 channels routing

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 hardware-switch. 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

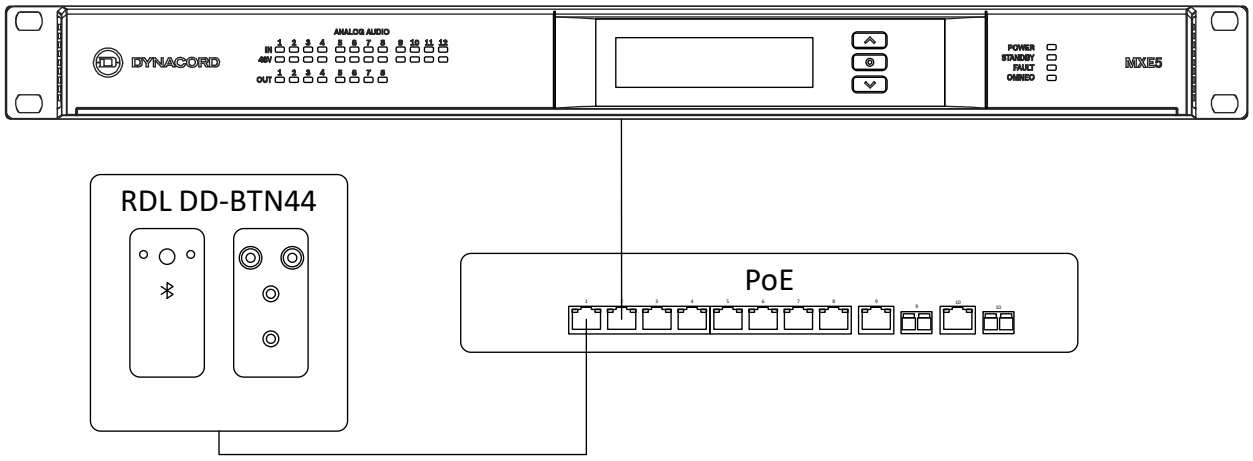

Image 7: DD-BTN44 connection to MXE via PoE Ethernet switch

Basic set up – software configuration

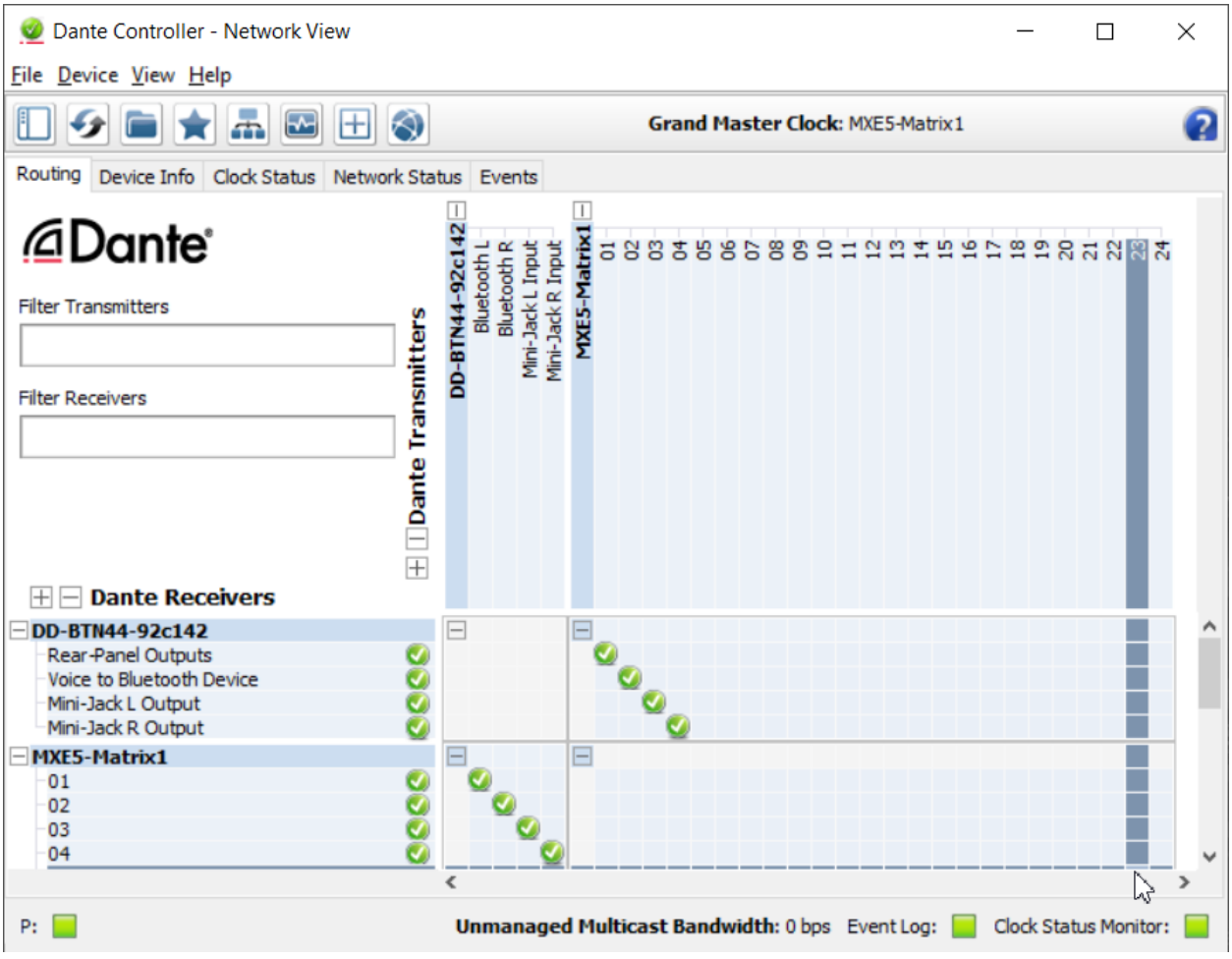

Image 8: Dante Controller – Network View – Routing: MXE5 <> DD-BTN44 4x4 channels routing

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.

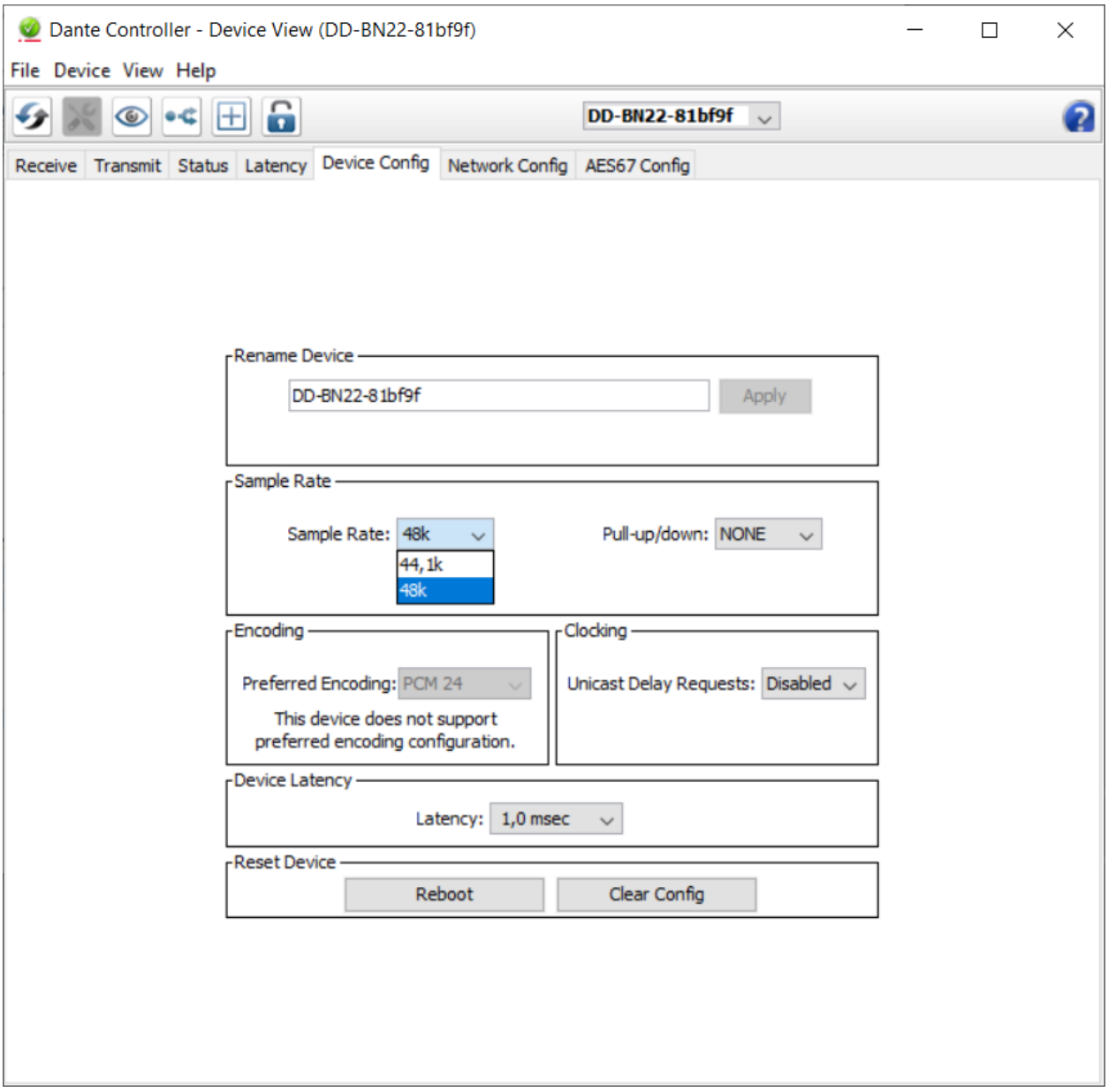

Image 9: Dante Controller – Device View – Device Config: DD-BN22 Sample Rate selection

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*.

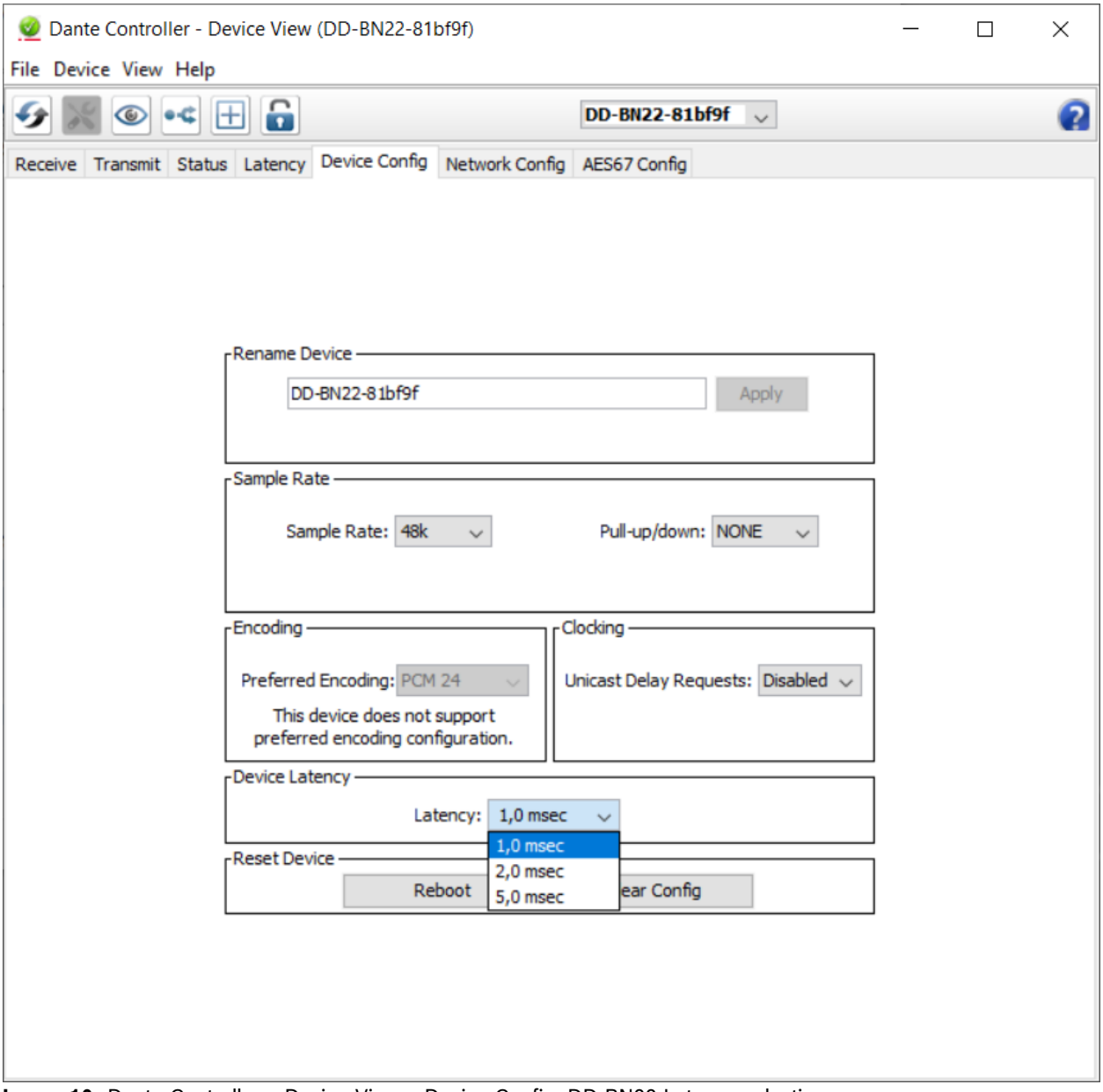

Image 10: Dante Controller – Device View – Device Config: DD-BN22 Latency selection

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.

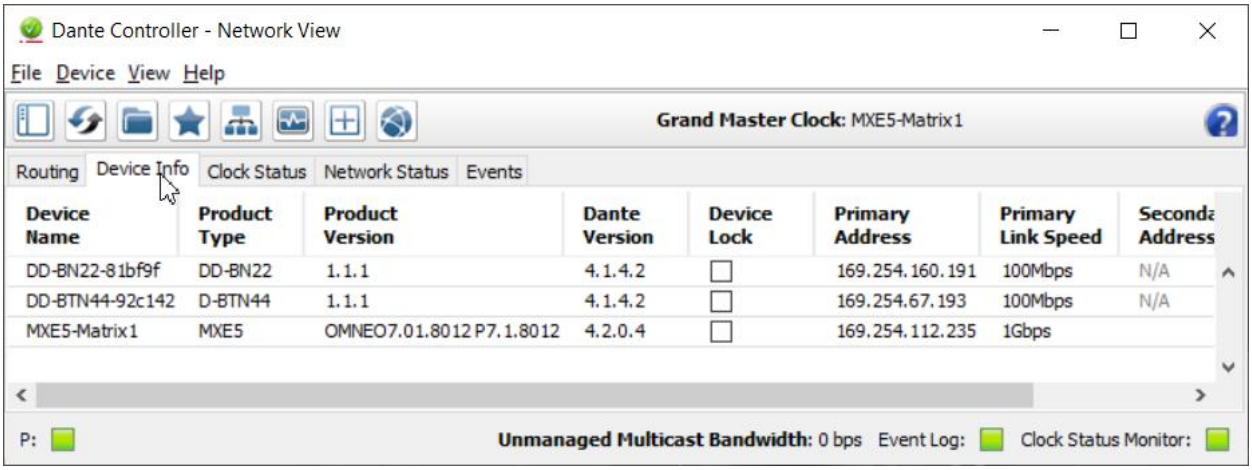

Image 12: Dante Controller – Network View – Device Info: MXE5, DD-BN22 and DD-BTN44 connected

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*.

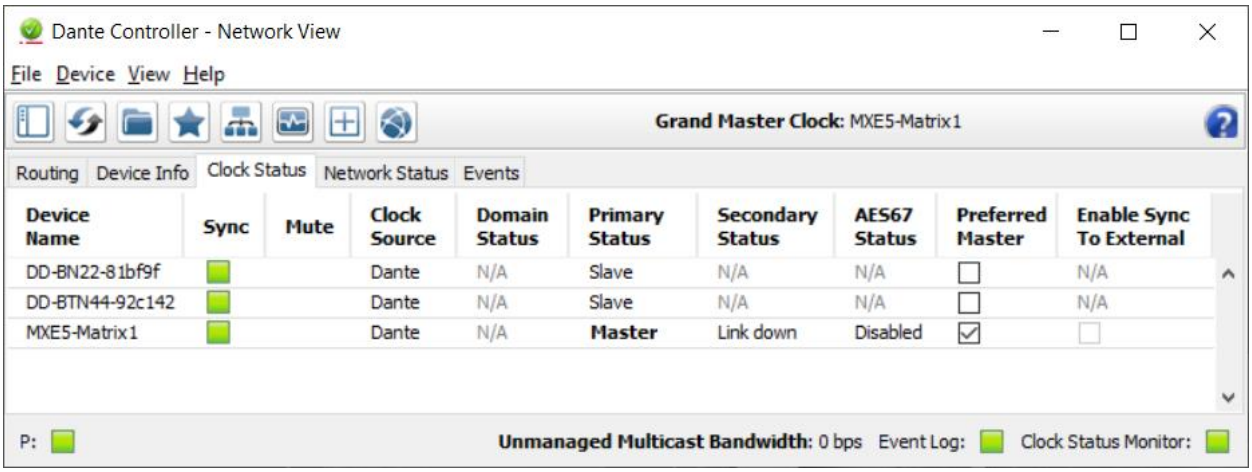

Image 13: Dante Controller – Network View – Clock Status: MXE5, DD-BN22 and DD-BTN44 connected

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

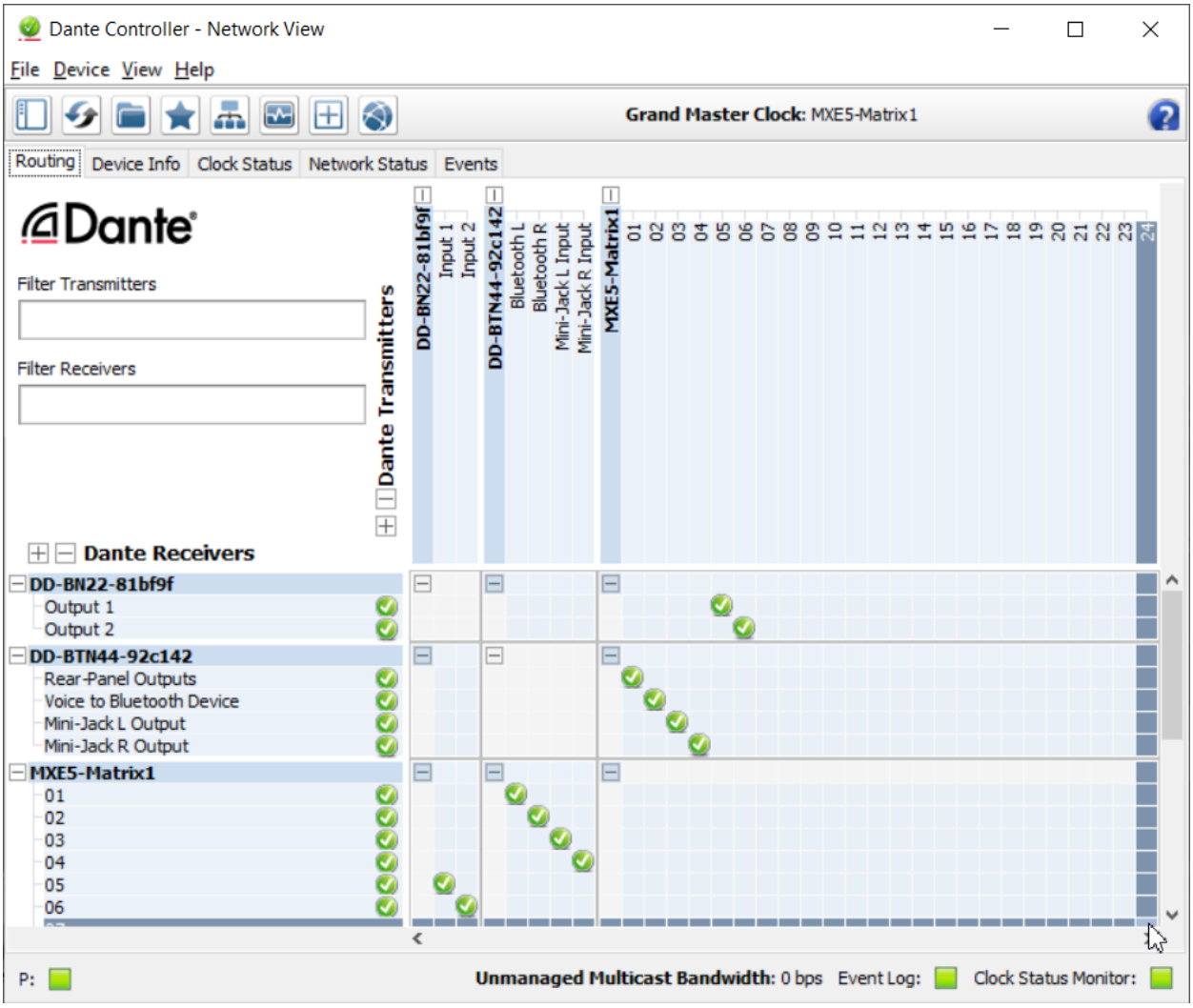

Image 14: Dante Controller – Network View – Routing: MXE5, DD-BN22 and DD-BTN44 connected

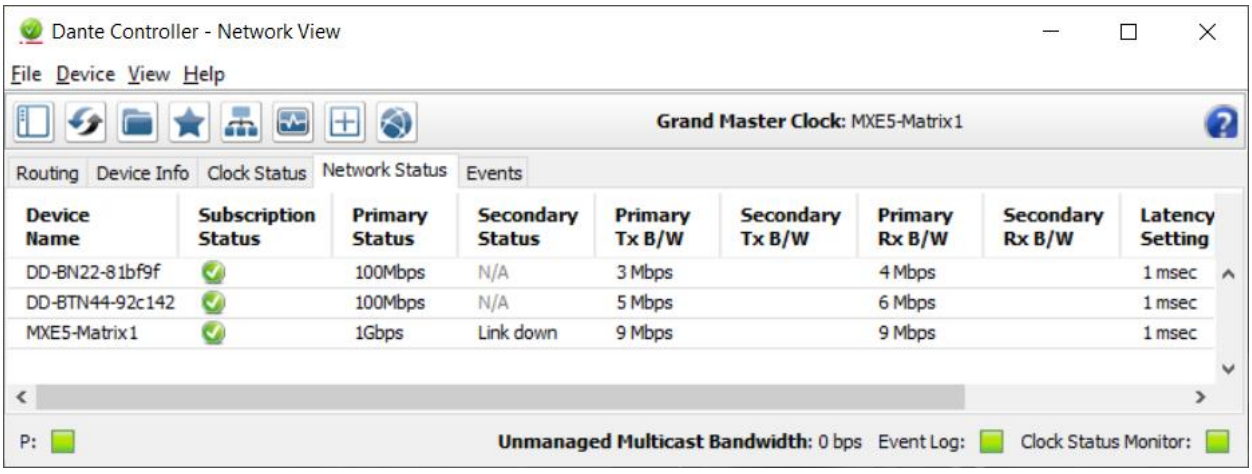

Image 15: Dante Controller – Network View – Network Status: MXE5, DD-BN22 and DD-BTN44 connected

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.