

# DN9650 Network Bridge



## Architect's & Engineer's Specification

The Network Bridge shall provide bidirectional asynchronous sample rate conversion of up to seventy-two (72) simultaneous channels of 24-bit resolution digital audio, between a three (3) port AES50 digital audio interface and a third party network module interface in a standard 1U high 19" rack mount chassis.

The Network Bridge shall have one (1) Ethernet Control Port for the purposes of remote configuration from a computer web browser interface and the updating of internal software.

The Network Bridge shall have two clock domains (AES50 and Network), separated by an Asynchronous Sample Rate Converter (ASRC). The Asynchronous Sample Rate Converter shall have a Bypass option with the facility to lock the Network Clock domain to the AES50 Clock domain.

The AES50 Clock domain shall support selection of clock source from either internal (on-board clock oscillator) or external (incoming clock via AES50 ports) synchronisation, Word Clock input, or Video Black Burst input which shall support incoming video synchronisation signals in PAL/SECAM/NTSC formats in Standard Definition (SD) and High Definition (HD) resolutions.

The Network Clock domain shall support clock synchronisation to incoming clock via third party network module, Word Clock Input or Video Black Burst Input which shall support incoming video synchronisation signals in PAL/SECAM/NTSC formats in Standard Definition (SD) and High Definition (HD) resolutions, as well as optionally slaving to the AES50 clock domain if the Sample Rate Converter is bypassed.

The Word Clock Output shall be capable of being derived from the AES50 Clock Domain, the Network Clock domain or the Word Clock Input.

The Dual Network Bridge shall have a precision clock reference provided by a temperature-controlled crystal oscillator (TCXO) with 1 part-per-million (1 ppm) stability.

The Network Bridge shall have user-selectable functions for both the AES50 and Network Clock domains to stop an output clock if the corresponding input clock fails, to propagate network failures across the ASRC for the purposes of automatic or manual redundancy switchover.

The Network Bridge shall support data format word length truncation and dithering on data received via the AES50 ports and transmitted via the third party network module interface.

The Network Bridge shall be capable of operating from a 100 to 240V  $\pm$ 10%, 50 to 60Hz AC power source.

The Network Bridge shall be the Klark Teknik DN9650 and no alternative option is available.

There are many different multichannel digital audio protocols available today. Some are well established and have been in common use for several years, others have appeared recently, and all are vying for recognition and market share. Interfacing different protocols can be difficult and expensive, often requiring the use of inflexible, proprietary hardware. Connecting different audio networks together, which often have differing sample rates and clock domains can be a difficult and expensive process. The DN9650 Network Bridge allows all Midas digital consoles and Midas digital I/O hardware, Klark Teknik DN9696 High Resolution Audio Recorders and many other AES50 devices to connect to many different multichannel digital audio networks simply and reliably.

Currently available interfaces include:-

- Audinate Dante
- Aviom A-Net
- Cirrus Logic CobraNet
- Digigram EtherSound
- MADI (AES10)

The DN9650 Network Bridge supports network modules designed and manufactured by Cirrus Logic, Inc., Lab X Technologies, LLC, and Audinate Pty Ltd.

**DN9650 Network Bridge features include:-**

- Three AES50 ports each supporting 24 bi-directional channels of 24-bit 96kHz audio (72 bi-directional channels in total)
- 1:1 channel mapping between AES50 channels and Network Module interfaces
- Bidirectional Asynchronous Sample Rate Conversion (ASRC) on every channel with Bypass facility
- User-selectable bidirectional "Stop Output Clock if Input Clock fails" function, to propagate network failures across ASRC for automatic or manual redundancy switchover
- Data format word length truncation and dithering
- Ultra-high stability reference-grade 1 part-per-million (1 ppm) temperature-controlled clock oscillator
- Supports operation at 44.1 kHz, 48 kHz and 96 kHz sampling frequencies
- Flexible third party interface clock synchronisation options:-
  - Network Module Incoming and Outgoing Clocks
  - Network Module Onboard Clock (with or without Word Clock In synchronisation)
  - Word Clock Input
  - Word Clock Output
  - Video Black Burst In (PAL/SECAM/NTSC formats in Standard Definition (SD) and High Definition (HD) resolutions)
- Platform-independent web browser configuration interface software hosted on integrated Linux web server
- Ethernet Control port for remote computer connection (web browser configuration and software updating)
- 100V-240V universal power supply
- 1U High 19" rackmount

**Clock Synchronisation**

The DN9650 clock synchronisation scheme is divided into two domains, with the AES50 domain and third party network domain separated by the Asynchronous Sample Rate Converter (ASRC).

**AES50 Domain Clock Options:-**

- AES50 External Clock
- Onboard Oscillator (AES50 Internal Clock)
- Word Clock Input
- Video Black Burst Input

**Network Domain Clock Options:-**

- External Network Clock
- External Network Clock with Word Clock In Synchronisation
- Onboard Oscillator (AES50 Internal Clock)
- Network Module Onboard Clock
- AES50 Clock Source
- Word Clock Input
- Video Black Burst Input

Note: Selection from above options may be limited by feature set of Third Party Module fitted.

### Front panel description

- 1 x Inlet Air Vent
- 1 x ETHERNET CONTROL Activity LED (Green)
- 3 x Pairs of green and red AES50 status LED indicators (OK, ERROR)
- 2 x AES50 Output "STOP OUTPUT CLOCK IF INPUT FAILS" yellow and red LED indicators (ENABLED, STOPPED)
- 1 x Asynchronous Sample Rate Converter ASRC ENABLED LED indicator
- 2 x Network Output "STOP OUTPUT CLOCK IF INPUT FAILS" yellow and red LED indicators (ENABLED, STOPPED)
- 1 x Pair of green/red Network Clock Status LED indicators (OK, ERROR)
- 1 x Backlit Alphanumeric LCD Display (16 characters x 2 Lines)
- 1 x Klark Teknik Tufflex label roundel label with Blue LED illumination

### Rear panel description

- 1 x Ethernet Control Port - Neutrik EtherCon with LED status indication
- 3 x AES50 Ports - Neutrik EtherCons with LED status indication
- 1 x Reset Switch (recessed)
- 1 x Word Clock Input - Neutrik BNC with 75 ohm termination
- 1 x Word Clock Output - Neutrik BNC (no termination)
- 1 x Video Black Burst Input - Neutrik BNC with 75 ohm termination
- 1 x Network Module
- 1 x mains inlet with integral fuseholder and switch
- 1 x 40 mm fan outlet with finger guard
- Electrical Safety Earthing Point

### Power Requirements

Voltage 100V a.c. to 240V a.c.  $\pm$ 10%  
Frequency 50Hz to 60Hz  
Consumption <50W

### Dimensions

Height 44.45 mm (1.75"), 1U high  
Width 482.0 mm (19.0")  
Depth 410.0 mm (16.1")

### Weight

Net 5.5kg  
Shipping 7.5kg



Klark Industrial Park, Walter Nash Road, Kidderminster, Worcestershire, DY11 7HJ, England.  
Tel: +44 1562 741515 Fax: +44 1562 745371 [www.klarktechnik.com](http://www.klarktechnik.com)

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