

PENTA

Routing and I/O

Professional I/O solutions and router infrastructure for analogue, digital and embedded audio systems



NTP TECHNOLOGY

A DAN TECHNOLOGIES COMPANY

NTP Technology

About NTP Technology

NTP was founded in 1958. Since 2003 NTP Technology has been a member of the Dan Technologies A/S group of companies based in Denmark. NTP Technology develops, manufactures and distributes professional high reliability Audio I/O solutions and router infrastructure for analogue, digital and embedded audio routing systems for major radio and television broadcasters world wide.

In 2008 NTP Technology acquired the company DAD – Digital Audio Denmark, a Danish manufacturer of high-end Audio AD/DA converter interfaces, which formed the NTP pro audio product line sold under the DAD brand name.

Top quality, innovative technology and perfection in performance are the reasons that NTP Technology has been a preferred supplier for the broadcast industry for more than 30 years. With a continuous focus on new technologies, creative implementations and customer needs, NTP Technology will continue to hold a significant position also in the future landscape for audio I/O and routing solutions.

With this approach NTP Technology provides smart I/O and router solutions for any application, whether this is a complex system for a broadcast studio facility, outside broadcast unit, or a simple I/O solution for performing art centres, concert halls or studio post production facilities.

NTP Technology's team of application engineers provides consultation on system configurations as well as training and technical demonstrations.

Major users of NTP router solutions

RAI – Radiotelevisione Italiana
China Radio International
Radio Beijing
Radio Nacional de España
Danish Broadcasting Corporation
Swedish Television
Swedish Radio
Radio NRJ, Rede Bahia
TV MIDTVEST, SVGTv – Commonwealth games
Europe one
Ganzu Radio
Radio 538
China Central Television
TV2 Lorry – Denmark
YLE – Finnish Broadcast Corporation
South African Broadcasting Corporation

Product Overview

The PENTA 720, PENTA 721 and PENTA 725 products are Broadcast oriented modular I/O, router and processing units with a focus on very reliable operation and redundancy. The Penta products are designed for use in television or radio studios, audio post production facilities and outside broadcast vehicles. The Penta products can be used in "stand-alone" configurations or as units combined into a router system. The Penta products are controlled via Ethernet by the various NTP control software applications and general protocols.

PENTA Router Core

The Penta products have been designed with the unique Penta router core based on a low latency and a highly reliable FPGA-based asynchronous matrix structure, with a time stamp mechanism providing equal latency for all signals routed through the Penta core. The Penta core has a total capacity of 2,048 x 2,048 non blocking cross points, which provides a capacity of 1,500 x 1,500 cross points on the I/O level. All inputs and outputs have processing for level adjustment, PPM level measurement, signal detection and latency management. A part of the router core also includes a 256 x 32 bus-based summing system.

AoIP via Dante / AES67

The PENTA 720 and PENTA 721 can optionally be fitted with the robust tried-and-tested Dante™ AoIP digital audio network technology, for routing and passing signals via a Gigabit IP network. The protocol also provides support for AES67 in compliance with current standards. The Dante Audio format provides fast, flexible, and cost efficient audio routing with an option for redundant operation via IP. The NTP Dante system is fully compatible with other Dante-enabled devices from more than 200 manufacturers.

The Dante / AES67 AoIP routing provides low latency, tightly synchronised transport of uncompressed audio over Gigabit networks using off the shelf switches.

NTP Blue | NET Routing

The PENTA 720, PENTA 721 and PENTA 725 products can form a routing system with distributed I/O functionality for signal distribution and routing in broadcast and other media related facilities. The NTP Blue | NET router control system is based on the NTP RCore router control system and enables control of the signal routing via a LAN / IP Ethernet based network structure.

PENTA 720

I/O unit and 1.5K router engine

Features

The PENTA 720 base unit comes as standard with the following digital interfaces:

- 8 AES3 I/O interface via 2 D25 connectors
- 1 MADI I/O coax interface via BNC connectors
- 2 interface for Pro Tools™ via SDR connectors

In addition to this, the base unit can be expanded with the following factory-installed options:

- 64 ch. Dante/AES67 AoIP I/O via RJ45 connectors
- Two Dual SFP MADI input/output mini module, which is also compliant to the NTP HotLink/Dual MADI format

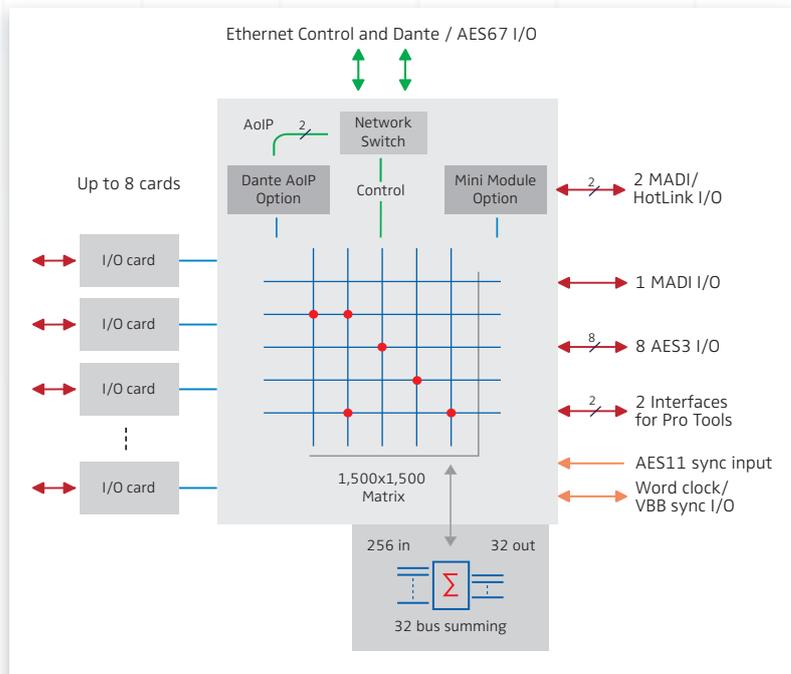
The PENTA 720 also features 8 option slots which can be configured with any combination of the following cards:

- 8 ch. analogue line input with optional mic-pre
- 8 ch. analogue line output
- Dual 3G/HD/SD-SDI 2x16 ch. embedder/de-embedder
- 16 ch. AES3 I/O interface w. SRC
- 128 ch. Dual MADI I/O interface

Technology Overview

The Penta 720 is based on a router core with a non-blocking 1,500 x 1,500 I/O matrix, channel based processing functionality and a common signal summing processor. The matrix provides fixed latency routing of all inputs to one or more outputs with a latency of 5 audio samples and supports sample rates from 44.1 to 384kHz.

The channel processor provides a signal detection logic, PPM level measurement as well as level control on all input and output channels. The common signal summing processor has a capacity of 32 mono summing output busses with a total of 256 inputs each with an individual level control.



Control and interface via Ethernet

The PENTA 720 is controlled and monitored via a network interface. Control protocols include NTP's own protocol as well as Pro Bel and Ember+. The PENTA 720 can be controlled by multiple controllers simultaneously.

The two network connectors on the back of the PENTA 720 are also used for the optional Dante /AES67 AoIP interface. The two ports can be configured as either switched ports for daisy-chaining multiple units or as redundant ports for the Dante/AES67 connections.



NTP Hotlink

NTP Hotlink is a digital audio format which provides 128 channels at 48 kHz sample rate on an optical fibre. NTP Hotlink is an ideal solution for high-capacity links between multiple Penta units. All SFP slots in the Penta units can be configured for either MADI or Hotlink operation.

Technical Overview

PENTA 720 I/O Cards

The PENTA 720 has 8 user configurable slots for I/O cards. The slots can be configured with any combination of the available analogue and digital cards, in addition to the digital interfaces provided on the base unit. The available card types are shown below.

Analogue I/O

- 8 ch. Line A/D card
- 8 ch. Mic/Line A/D card
- 8 ch. D/A card

Sample rate support 44.1 to 384kHz

AES/EBU I/O

- 8 Stereo AES3 I/O card with selectable input sample-rate converter

AES/EBU I/O according to the AES3 standard
Sample rate support 44.1 to 192kHz

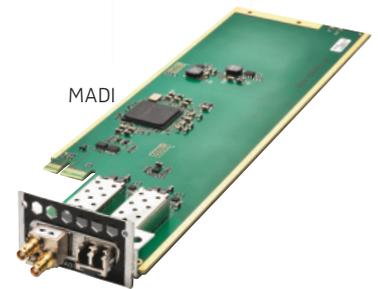
MADI I/O

- Dual MADI 128 ch. I/O card with connection via SFP modules for a choice of optical or coax I/O. The two SFP slots can also be configured for redundant operation with auto swithing. The card can also be set in NTP Hotlink mode providing 128 channels of I/O on a redundant SFP interface.

Sample rate support for MADI is 44.1 to 384 kHz and in Hotlink mode 48 kHz

3G SDI I/O

- Dual 3G/HD/SD-SDI 2x16 ch. embedder/de-embedder card with selectable sample rate converter on inputs and outputs and input loop trough. In embedding mode a video input signal must be applied.



PENTA 720 Rear Panel

The rear panel of the PENTA 720 has a fixed I/O configuration and a number of configurable options including a dual power supply. A mini module with various options, and a Dante AoIP option can be installed inside the unit and up 8 I/O cards can be installed in the card tray with hot swap support and front mount access.



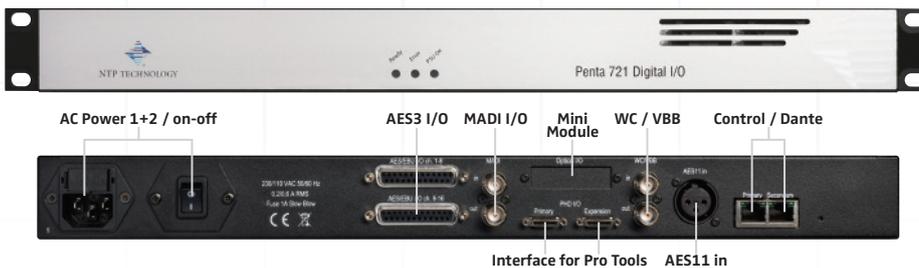
- 1 AES/EBU I/O Lines 1-4
- 2 AES/EBU I/O Lines 5-8
- 3 MADI I/O via BNC
- 4 DigiLink™ Primary port
- 5 DigiLink™ Primary/Exp port
- 6 Word Clock or VBB input
- 7 Word Clock output
- 8 AES11 sync input
- 9 Gigabit Ethernet control and Dante/AES67 AoIP I/O
- 10 SFP interface module for dual MADI and NTP Hotlink I/O
- 11 Card slots for 8 cards

PENTA 721 & 725

I/O unit and router engines

PENTA 721 I/O Unit and Router

The PENTA 721 is a compact 1U digital audio interface designed for stand-alone use in radio stations, as a AoIP interface for Dante/AES67 based WAN connections and as an I/O unit in a router system application. PENTA 721 has the same basic input/output configuration as the PENTA 720 but without the card slots, providing a 384 x 384 router. The router and processor engine is identical to the PENTA 720.



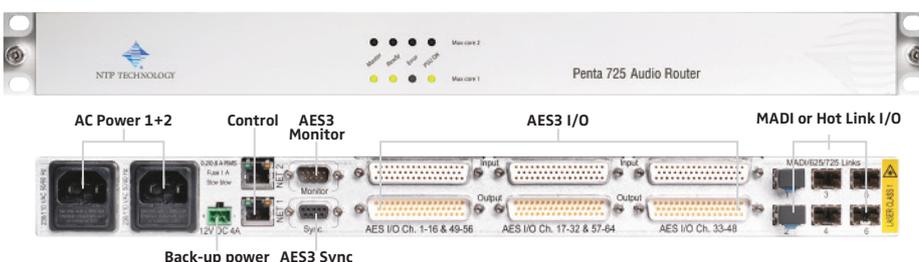
The PENTA 721 can be controlled via a number of protocols including Penta protocol, Pro-Bel SW-P-08 and Ember+. NTP application software includes PENTAMAN, DADman and the NTP control systems RCore and Blue | NET.

SPECIFICATIONS:

- 8 line AES3 I/O, 16 channels – 44.1 to 192kHz
- 2 interface for Avid Pro Tools, 64 channels – 44.1 to 192kHz
- Mini-option, 2 MADI SFP I/O with 128 channels – 44.1 to 384kHz or 2 NTP Hotlink I/O, 256 channels at 48 kHz
- 1 Coax MADI I/O, 64 channels – 44.1 to 384kHz
- Dante AoIP option, dual RJ45, 64 channels – 44.1 to 192kHz
- External synchronization via AES11, Word Clock, Video Black Burst, or digital interfaces
- Single or dual power supply, 90-264 VAC

PENTA 725 AES/EBU I/O and MADI Router

The PENTA 725 is a 1U AES3 digital audio interface and a MADI and NTP Hotlink router designed for medium-sized router systems in radio and TV stations, as well as a sub router in connection with larger NTP 625 TDM router systems. The PENTA 725 features up to 64 stereo AES3 I/O's and up to 6 MADI/Hotlink I/O with a 768 x 768 routing matrix. As an option, the PENTA 725 can be configured a 128 channel sample rate converter which can be applied to both AES3 and MADI inputs.



The PENTA 725 can be controlled via PENTAMAN, Penta protocol and the NTP control systems RCore.

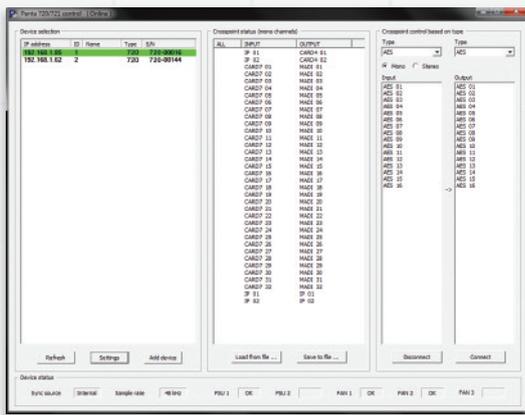
SPECIFICATIONS:

- 32 or 64 line AES3 I/O, 64/128 channels – 44.1 to 48kHz
- 6 configurable MADI or Hotlink I/O, 384/768 channels at 48kHz
- External synchronisation via AES11 or digital interfaces
- 32 or 64 optional sample rate converter – 44.1 to 192kHz
- AES3 true monitor output selectable for all AES3 input channels
- Equal power supply, 90-264 VAC and 12V DC input

Control

Operation and Configuration

The Penta products are controlled via a standard network connection. The Penta products all communicate via the NTP Penta protocol and the PENTA 720 and PENTA 721 also support the Pro-Bel SW-P-08 and Ember+ protocols. NTP offers a range of application programmes for the configuration and management of the Penta units, including the Penta manager (PENTAMAN) and DAD manager (DADman) as well as the NTP Router control systems, RCCoreV4 and Blue | NET.

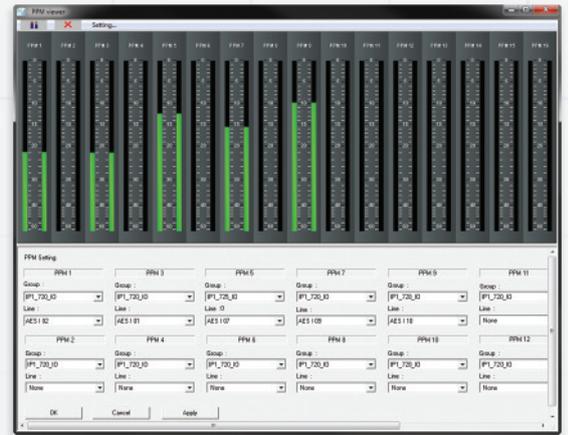


Penta Manager, PENTAMAN

The Penta manager control software runs on Microsoft Windows. PENTAMAN is a stand-alone user application for complete configuration and operation of the Penta 720/721 interfaces. More Penta units can be controlled by the application.

PPM Signal Monitoring

The PPM signal monitoring software runs on Microsoft Windows as a stand-alone application for configuration, display and monitoring of input and output signal levels of one or more Penta units.

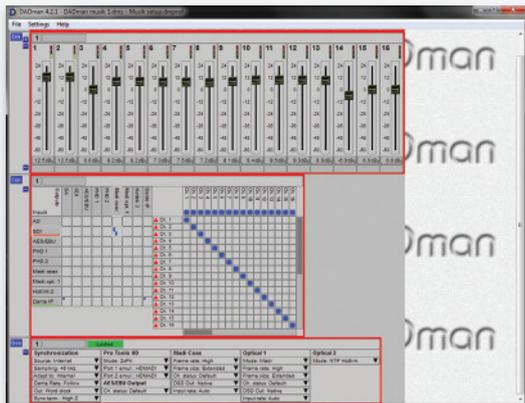


Operation via a control system

The Penta products can be used and operated in systems managed by a control system. The control system can be the NTP RCCore or the Blue | NET control system, or a 3rd party control system supporting either the NTP Penta command protocol or the industry standard Pro-Bel SW-P-08 or Ember+ protocols.

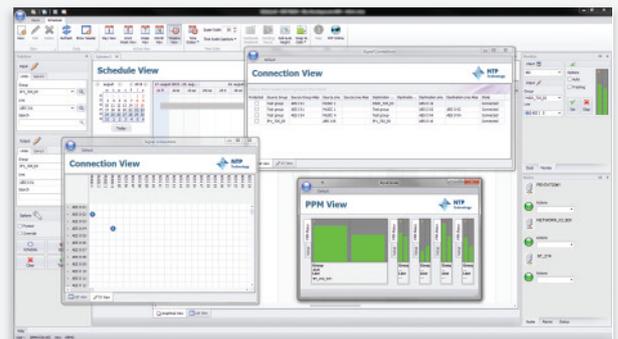
VMC 2 – Blue | NET control

When using VMC 2 and the NTP Blue | NET Control System, it is possible to establish an overall management of signal routing for all the Penta units and other Dante-enabled AoIP units, with an IP network as the back-bone for the signal distribution. The management of the system layout is done by the control system with a system database configured to have all information of the system. When using the Penta products configured with a central MADI router the NTP RCCore control system can be used for controlling a similar way to the Blue | Net system. User operation of the control system can be done via various VMC client software applications like the VMC 2.



DAD Manager, DADman

The DADman control software runs on Microsoft Windows and Apple OS X. DADman is a stand-alone user application for complete configuration and operation of the DAD products as well as the PENTA 720/721 interfaces. DADman can manage multiple Penta units and Penta units can be controlled simultaneously from multiple computers running DADman.

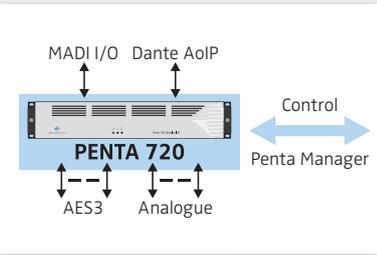


Applications

STAND-ALONE I/O EXAMPLES

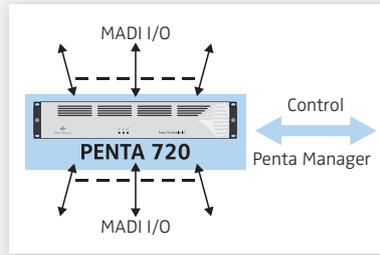
I/O Audio Interface

PENTA 720 used as a conversion interface between MADI, Dante, AES3 and Analogue, controlled via PENTAMAN.



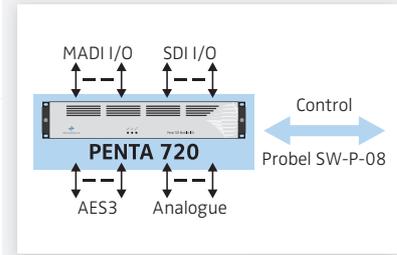
MADI Router

PENTA 720 used as a central MADI router with up-to 18 optical or electrical MADI I/O connection, controlled via PENTAMAN.



I/O Routing with 3rd party control

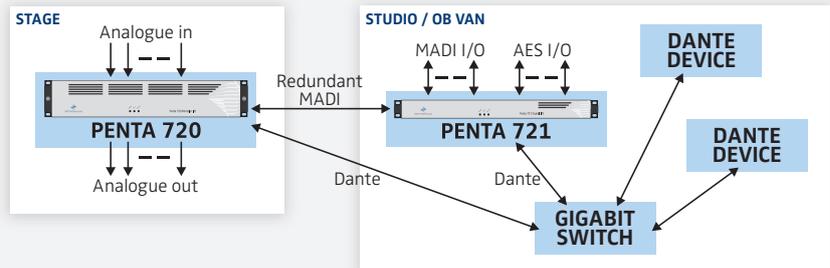
PENTA 720 used as a conversion interface between MADI, SDI, AES3 and Analogue, controlled via a control protocol.



SMALL SYSTEM EXAMPLES

On location / OB van set-up

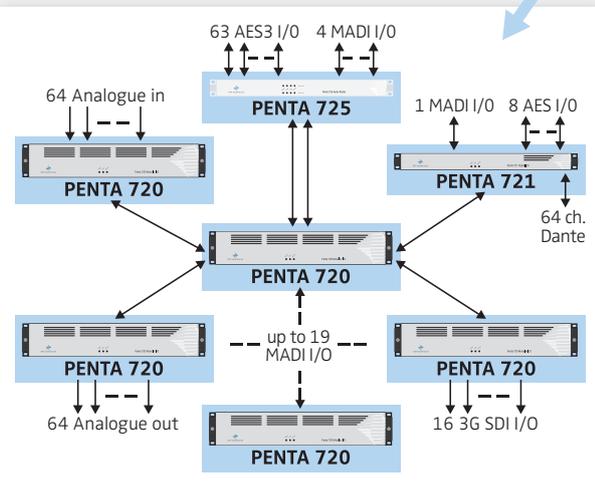
PENTA 720 and 721 used as a pair for MADI and Dante audio interfacing between a stage and a studio. On the stage the 720 is used for analogue I/O, and in the studio the 721 is used as a digital bridge between the stage signals and the studio infrastructure, also using other Dante devices.



ROUTER EXAMPLES

1,152 x 1,152 MADI Router System

PENTA 720 used as a MADI-based main router connecting more PENTA 720, 725 and 721 units, which are used as sub-routers and I/O to the peripheral devices. The router system is managed by the NTP RCore control system.

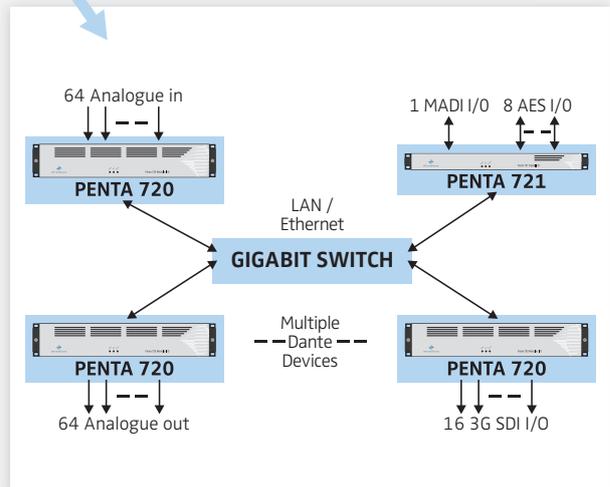


Blue | NET | RCore Control System



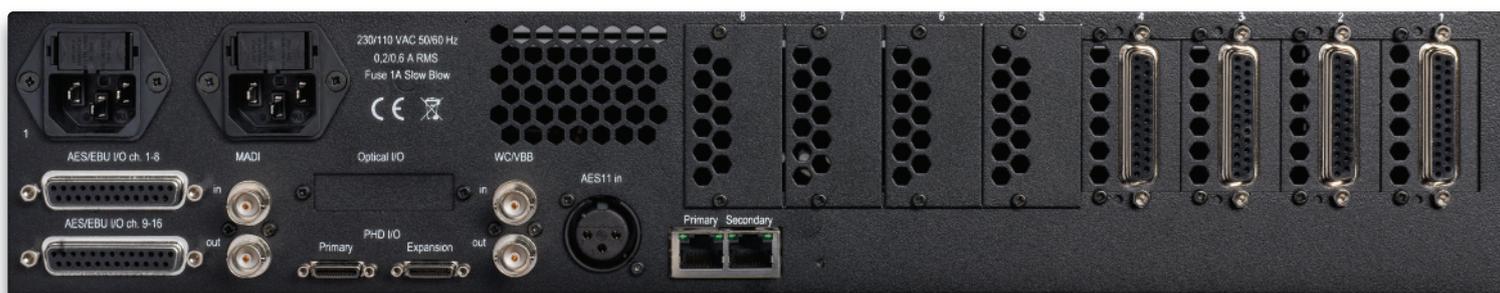
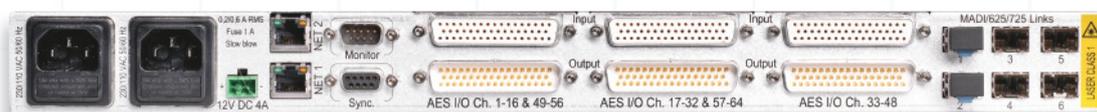
'Any size' Dante AoIP Router System

PENTA 720 and 721 are used as peripheral I/O in a router system where all interconnection between units is done on a LAN / IP Ethernet using Dante / AES67. The routing control can be done via the NTP Blue | NET router control system.



NTP Technology

Masterful connections



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