NTP TECHNOLOGY

AUDIO ROUTING SOLUTIONS

Installation Guide

Penta 720-800A modular I/O
Base unit, 2U 19" chassis

Contents

IMPORTANT SAFETY INSTRUCTIONS
READ AND KEEP THESE INSTRUCTIONS

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

The garbage bin with a cross is intended to alert the user that the product may not be disposed of by regular garbage, but as electronic equipment.

WARNING – when using electric products, basic precautions should be followed, including the following:

Read all of the safety and installations instructions and explanation of graphic symbols before using the product.

1   Do not use this apparatus near water.

6.   Clean only with dry cloth.

7.   Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8.   Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9.   Do not defeat the safety purpose of the polarized or grounding-110 to 125V type plug according to UL 817 and CSA C22.2 no. 42. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11 Only use attachments/accessories specified by the manufacturer

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13 Unplug this apparatus during lightning storms or when unused for long periods of time.

14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

DANGER

Improper connection of the equipment-grounding can result in a risk of electric shock. Do not modify the plug provided with the product – if it will not fit the outlet have a proper outlet installed by a qualified electrician. Do not use an adapter which defeats the function of the equipment-grounding conductor. If you are in doubt as to whether the product is properly grounded, check with a qualified serviceman or electrician.

The product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a power supply cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet which is properly installed and grounded in accordance with all local codes and ordinances.

WARNING

- This product, either alone or in combination with an amplifier and speakers or headphones, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
- The product should be located so that its location or position does not interfere with its proper ventilation.
- The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time. When unplugging the power supply, do not pull on the cord, but grasp it by the plug.
- Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

SERVICE

- Do not attempt to service the product beyond that described in the user maintenance instructions. All other servicing should be referred to qualified service personnel.
- The product should be serviced by qualified service personnel when:
    1. The power supply cord or plug has been damaged, or
    2. Objects have fallen, or liquid has spilled into the product, or
    3. The product has been exposed to rain, or
    4. The product does not appear to be operating normally or exhibits a marked change in performance, or
    5. The product has been dropped, or the enclosure damaged.

WARNING – Hazardous moving parts. Keep fingers and other body parts away
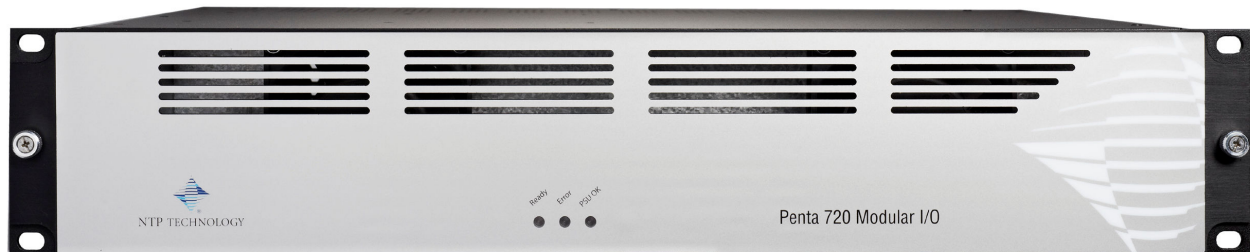
General description.

The 720-800A base unit is the basic chassis of the Penta 720 Modular I/O audio router unit. It consists of a 19" wide, 2U high sub rack, equipped with a basic I/O and router main board and a backplane to accommodate a total of 8 I/O cards providing flexible and versatile I/O structure for various router and I/O applications. The modular I/O cards are hot-swappable, and can be accessed by opening the front plate of the unit. As standard the basic chassis is equipped with two fixed power supplies for redundant power operation. A modular power supply bay is also available with two retractable power supply units.

The 720-800A base unit is quipped with two fans mounted in the front panel with sufficient airflow to assure cooling of all electronics in the base unit. The fans adjust the speed depending on the temperature inside the Penta 720. Since the unit is designed for machine room installation, the fans can be quite noisy in high temperature environments.

The air inlet is on the front of the unit and the air exhaust is on that back of the unit. When mounted in a rack make sure that the air can pass freely trough the unit. The Penta 720 facilitates supervisory circuitry for all fans, voltages, and the internal temperature

Accessing the Penta 720 cards.

The Penta 720 cards mounted in the 720-800A base unit are accessed by opening the hinged front panel of the unit. The front panel is opened by un screwing the two finger screws in both side of the unit. The front panel can tilt down but is supported by hinges in both sides.

The up-to 8 Penta 720 I/O cards are placed vertically in the unit and can be removed by releasing the rear panel screws and pulling at the front of the card. The cards support hot swop and can be pulled and inserted in the frame while the unit is in operation.

For more details on the I/O cards please refer to the individual installation guides for these cards.

Note that the installed cards are mounted in the rear panel with screws which has to be removed before a card can be extracted.

All installation guides and more documentation can be downloaded from www.ntp.dk

Operation

The Penta 720 is operated via the Network port using the Penta manager control program, or via the NTP Router Control System RCCore, when the unit is a part of an integrated routing system. On the front panel there are LED indicators showing the status of the unit, and on the rear panel there is "*reconfig*" button by which the unit can be set into certain pre configured modes.

Front panel LED's

Penta 720 has 3 LED indicators on the front panel. The indicators are **Ready, Error** and **PSU OK.** The function of the indicators are described below.


Ready ON	Green LED indicates that the unit is operative, and all software is loaded and OK.
Ready BLINK	Green LED blink indicates that the unit is in reconfig mode
Error ON	Red LED indicates a hardware error on the unit. This could be an I/O card that is not working, a fan fault or a PSU error. A detailed report will be in the alarm log of the control software. In normal operation the LED is off.
PSU OK ON	Green LED indicates that the power supplies are OK.
PSU OK BLINK	Green LED blink indicates that one of the two power supply is not OK or absent.

Reconfig button

The "*reconfig*" button is accessed via a hole in the rear panel using a pen or a similar pointed item. Trough the hole a green LED is visible, which will light up indicating the various reconfig modes of the Penta 720 as a result of the activation of the "*reconfig*" button. When Penta 720 is in recovery mode the **Ready** Led on the front panel of the unit will blink.

Recovery mode
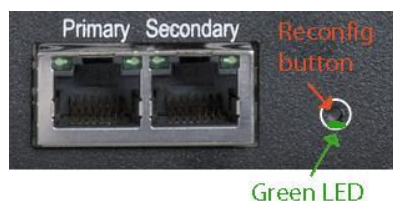
|	
"reconfig" push while the unit is powering up Green LED turns ON	The Penta 720 enters a recovery mode. In this mode only a basic boot code is operative in the unit, and new code can be downloaded by the NTP download software. This mode is used if the software on the platform for some reason is not operative. The IP address of the unit is the one currently used and stored in the internal EERPOM
"reconfig" short push while the unit is in reconfig mode and Green LED is on Green LED turns OFF	The Penta 720 remains in reconfig mode as described above. The IP address of the unit is however **the default address 10.0.7.20**, and IP discovery is set to DHCP which will change the IP address if a DHCP server is available in the network

The selection of either of the two recovery modes are fixed after selection. The purpose of the recovery mode is to download new firmware to the unit running only the fixed internal boot code in a simple default configuration if download of firmware is not working in normal operating mode of the unit. By enabling recovery mode with default IP address and network configuration the unit can always be identified on a network via the default setup. Once download is completed the unit will enter normal operation. Alternatively the unit has to be re-powered.

Note that the IP address referred to is the IP address of the controller/management interface of the unit. This is not the IP address of the IP audio interface if a such is installed. This IP address can not be managed locally on the unit.

Restore defaults
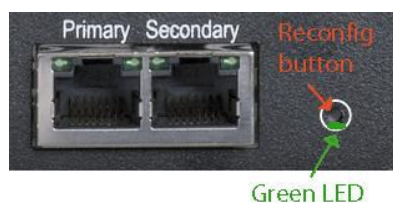
"reconfig" long push 10 sec. while the unit is in normal operation.

Release *reconfig"* button

Green LED OFF

The Penta 720 enters a restore default mode. In this mode all setting of the unit is initialized to the factory programmed defaults.

The IP address of the unit is the one currently used and stored in the internal EERPOM

When the *"reconfig"* button is released the firmware of the unit restarts with the factory default settings and enter normal operation automatically.

Penta manager software

For description of the Penta manager software please refer to the software user guide. Note that when the Penta 720 is a part of an NTP router system, all management of the unit is handled by the control system.

Below is a screen dump of the basic/opening control window of the Penta manager software.
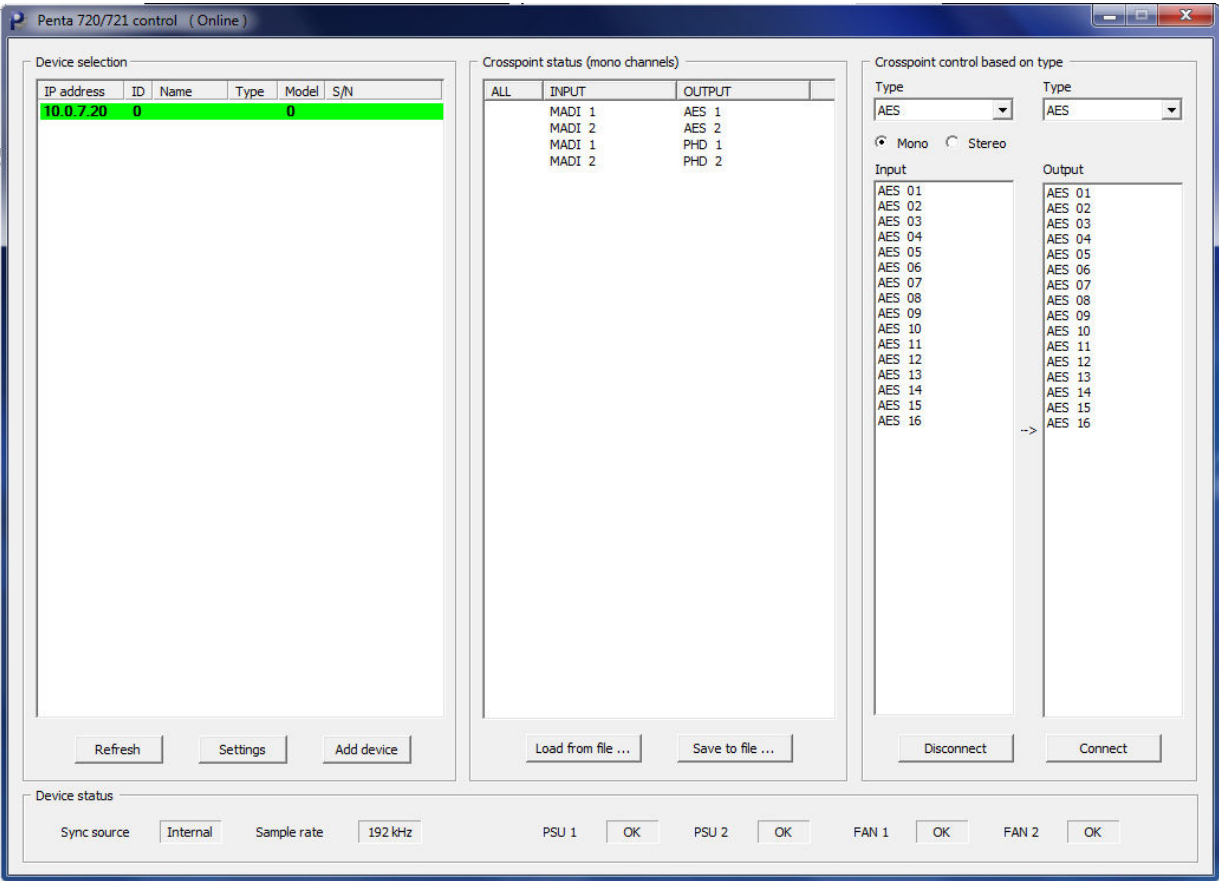
Rear panel layout.

Rear panel layout

Rear panel layout

1. Card slot 1 to card slot 8

2. Mini module slot

3. Mains inlet 2.

4. Mains inlet 1. The base unit is equipped with one power supply unit mounted with two redundant power supplies. Each power supply is connected to its own power inlet. Both mains inlets must be connected to either the same mains supply or to two individual supplies for fully redundant operation.

5. AES/EBU input and output. 25 pole D-sub female connector. AES/EBU I/O channel 1-4

6. AES/EBU input and output. 25 pole D-sub female connector. AES/EBU I/O channel 5-8

7. MADI input and output BNC connector, MADI I/O number 1

8. Dig Link interface port for Pro Tools HDX, Primary port

9. Dig Link interface port for Pro Tools HDX, Primary port or Secondary port (configurable)

10. Word Clock or Video Black Burst sync. input BNC connector (configurable)

11. Word Clock sync. output BNC connector

12. AES11/AES3 sync. input XLR female connector

13. Ethernet control and IP audio Primary port (net 1) RJ45 connector

14. Ethernet control and IP audio Secondary port (net 2) RJ45 connector

15. Reconfigure button, and status LED

Dual SFP optical I/O mini-module, 720-150
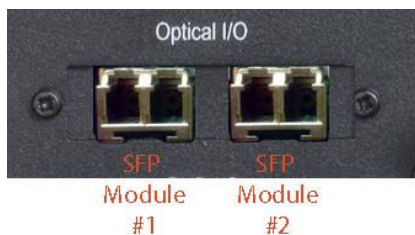
The Dual SFP optical module, can be installed with one or two "Small form-factor pluggable" (SFP) transceiver modules.

The SFP modules are standard types which support various types of optical interfaces with LED or Laser diodes and various wave lengths.

Each SFP module has a receiver and a transmitter part, and can be used for MADI audio I/O or the NTP Dual MADI format called "Hotlink".

The right part of the SFP connector is the receiver and the left part is the transmitter.

Terminal Connections.

AES11 sync input XLR connector
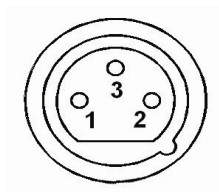
Pin 1.	TX. +
Pin 2.	TX. –
Pin 3.	RX. +

Ethernet, RJ45 connector

Pin 1.	TX. +
Pin 2.	TX. –
Pin 3.	RX. +
Pin 4, 5, 7, 8.	NC
Pin 6.	RX -

AES/EBU input/output 25 pole D-sub connectors.

AES/EBU I/O ch. 1-4

AES/EBU I/O ch. 5-8
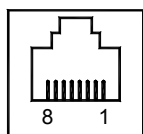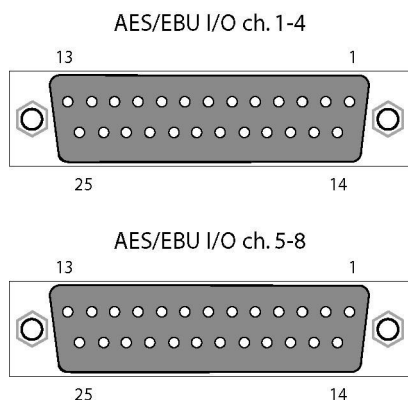
Female connectors

Female connector for AES/EBU input and output connections

The top connector provides the connection for the first 4 AES/EBU input and output channels. The lower connector provides the connection for the last 4 AES/EBU input and output channels, providing a total of 8 AES/EBU I/O channels.

Below is listed the connection for the combined input and output 25 pole D-sub connector. The pinning is according to the proprietary standard by the company **Tascam**.

Connections channel 1-4 i.e. channel 5-8

Pin no	Func.		Pin no	Func.	
1	DOUT 4/8 +		14	DOUT 4/8 -	
2	GND		15	DOUT 3/7 +	
3	DOUT 3/7 -		16	GND	
4	DOUT 2/6 +		17	DOUT 2/6 -	
5	GND		18	DOUT 1/5 +	
6	DOUT 1/5 -		19	GND	
7	DIN 4/8 +		20	DIN 4/8 -	
8	GND		21	DIN 3/7 +	
9	DIN 3/7 -		22	GND	
10	DIN 2/6 +		23	DIN 2/6 -	
11	GND		24	DIN 1/5 +	
12	DIN 1/5-		25	GND	
13	N.C.				

I/O Card connections.

8 channel analogue AD card and 8 channel analogue DA card

Analouge I/O 25 pole D-sub connectors.

8 ch. Analogue out

8 ch. Analogue in

Female connectors

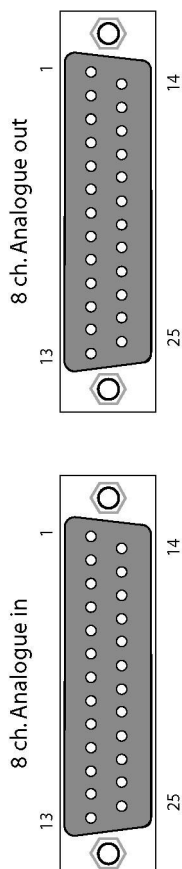The two optional analogue card for the Penta 720,

- 720-130A, 8 ch. AD Card 192 kHz and
- 720-230A, 8 ch. DA Card 192 kHz,

Are interfaced via a 25 pole D-sub connectors on the card which is accessible from the rear panel of the Penta 720 chassis.

This connector type is used both for the analogue input card and for the analogue output card.

Below is listed the connection for the combined input and output 25 pole D-sub connector. The pinning is according to the proprietary standard by the company **Tascam**.

For more a detailed description of the two cards please refer to the specific user guides.

Connections channel 1-8

Pin no	Func.		Pin no	Func.	
1	AIN/OUT 8 +		14	AIN/OUT 8 -	
2	GND		15	A/IN/OUT 7 +	
3	AIN/OUT 7 -		16	GND	
4	AIN/OUT 6 +		17	AIN/OUT 6 -	
5	GND		18	AIN/OUT 5 +	
6	AIN/OUT 5 -		19	GND	
7	AIN/OUT 4 +		20	AIN/OUT 4 -	
8	GND		21	AIN/OUT 3 +	
9	AIN/OUT 3 -		22	GND	
10	AIN/OUT 2 +		23	AIN/OUT 2 -	
11	GND		24	AIN/OUT 1 +	
12	AIN/OUT 1-		25	GND	
13	N.C.				

Dual SDI/HD/3G embedder/deembedder card w. SRC

BNC video I/O connectors
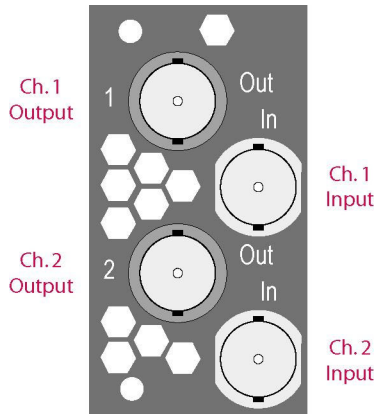
The optional SDI/HD/3G embedder/deembedder card for the Penta 720

- 720-210A, Dual SDI/HD/3G embedder/deembedder card w. SRC

Is interfaced via 4 BNC connectors on the card, which are accessible from the rear panel of the Penta 720 chassis.

The two top connectors are used for SDI channel 1 and the lower connectors for SDI channel 2.

For more a detailed description of the card please refer to the specific user guides for these cards.

Electrical specifications.

Power consumption .... 90 VA max.

Input voltage .... 90 – 260 VAC

100 – 240 VAC Nominal, 47 - 63 Hz

Mains fuse, mounted in IEC connector............................ 1 A, T1AH/250V

Safety compliance.. EN 60950-1:2006

Power supply cord must be min. light sheathed flexible cord according to IEC60227 (designation 60227 IEC 52) and include a protective earth conductor having a green-and-yellow insulation. Cross-sectional areas min. 3x0.75mm2"

Mains line plug type	Correct type acc. to standard
110-125V	UL817 and CSA C22.2 no 42
220-230V	CEE 7 page VII, SR section 107-2-D1/IEC 83 page C4.
240V..	BS 1363 of 1984.Specification for 13A fused plugs and switched and unswitched socket outlets

Mechanical Dimensions:

Chassis standard .... 19", 2 RU

Chassis depth, without connectors mounted.................... 35,0 cm

Chassis body width .... 43,5 cm

Weight, not including I/O cards.. 5 kg

Environment specifications.

Operating Temperature .... 0 – 45 ^{0}C

Operating Humidity .... up-to 80RH (non-condensing) at 30 ^{0}C

EMC compliance... EN 55103-1, part 1: emission

EN 55103-2, part 2: Immunity

FCC 47 CFR part 15 (B): emission