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Instruction Manual

Precis LT

Distribution Matrix



AutoPatch Matrix Switchers

Release: 10/05/2009

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All products returned to AMX require a Return Material Authorization (RMA) number. The RMA number is obtained from the AMX RMA Department. The RMA number must be clearly marked on the outside of each box. The RMA is valid for a 30-day period. After the 30-day period the RMA will be cancelled. Any shipments received not consistent with the RMA, or after the RMA is cancelled, will be refused. AMX is not responsible for products returned without a valid RMA number.

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- AMX will complete the repair and ship the product within five (5) business days after receipt of the product by AMX. The AMX Authorized Partner will be notified if repair cannot be completed within five (5) business days.
- Products repaired will carry a ninety (90) day warranty or the balance of the remaining warranty, whichever is greater.
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- AMX will continue to provide Warranty Repair Services for products discontinued or replaced by a Product Discontinuance Notice.

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- The AMX Authorized Partner must contact AMX Technical Support to validate the failure before pursuing this service.
- Non-warranty repair is a billable service.
- Products repaired under this policy will carry a ninety (90) day warranty on material and labor.
- AMX will notify the AMX Authorized Partner with the cost of repair, if cost is greater than the Standard Repair Fee, within five (5) days of receipt.
- The AMX Authorized Partner must provide a Purchase Order or credit card number within five (5) days of notification, or the product will be returned to the AMX Authorized Partner.
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- Products will be repaired within ten (10) business days after AMX Authorized Partner approval is obtained.
- Non-repairable products will be returned to the AMX Authorized Partner with an explanation.
- See AMX Non-Warranty Repair Price List for minimum and Standard Repair Fees and policies.

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ESD Warning



To avoid ESD (Electrostatic Discharge) damage to sensitive components, make sure you are properly grounded before touching any internal materials.

When working with any equipment manufactured with electronic devices, proper ESD grounding procedures must be followed to ensure people, products, and tools are as free of static charges as possible. Grounding straps, conductive smocks, and conductive work mats are specifically designed for this purpose.

Anyone performing field maintenance on AMX AutoPatch equipment should use an appropriate ESD field service kit complete with at least a dissipative work mat with a ground cord and a UL listed adjustable wrist strap with another ground cord. These items should not be manufactured locally, since they are generally composed of highly resistive conductive materials to safely drain static charges, without increasing an electrocution risk in the event of an accident. ESD protective equipment can be obtained from 3M™, Desco®, Richmond Technology®, Plastic Systems®, and other such vendors.

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Important Safety Information & Instructions

When using and installing your AMX AutoPatch product, adhere to the following basic safety precautions. For more information about operating, installing, or servicing your AMX AutoPatch product, see your product documentation.

- Read and understand all instructions before using and installing AMX AutoPatch products.
- Use the correct voltage range for your AMX AutoPatch product.
- There are no user serviceable parts inside an AMX AutoPatch product; service should only be done by qualified personnel.
- If you see smoke or smell a strange odor coming from your AMX AutoPatch product, turn it off immediately and call technical support.
- For products with multiple power supplies in each unit, make sure all power supplies are turned on simultaneously.
- Use surge protectors and/or AC line conditioners when powering AMX AutoPatch products.
- Only use a fuse(s) with the correct fuse rating in your enclosure.
- Make sure the power outlet is close to the product and easily accessible.
- Make sure the product is on or attached to a stable surface.
- Turn off equipment before linking pieces together, unless otherwise specified in that product's documentation.
- For safety and signal integrity, use a grounded external power source and a grounded power connector.
- To avoid shock or potential ESD (Electrostatic Discharge) damage to equipment, make sure you are properly grounded before touching components inside an AMX AutoPatch product.

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Information et directives de sécurité importantes

Veuillez vous conformer aux directives de sécurité ci-dessous lorsque vous installez et utilisez votre appareil AMX AutoPatch. Pour de plus amples renseignements au sujet de l'installation, du fonctionnement ou de la réparation de votre appareil AMX AutoPatch, veuillez consulter la documentation accompagnant l'appareil.

- Lisez attentivement toutes les directives avant d'installer et d'utiliser les appareils AMX AutoPatch.
- Le voltage doit être approprié à l'appareil AMX AutoPatch.
- Les appareils AMX AutoPatch ne contiennent aucune pièce réparable par l'usager; la réparation ne doit être effectuée que par du personnel qualifié.
- Si de la fumée ou une odeur étrange se dégagent d'un appareil AMX AutoPatch, fermez-le immédiatement et appelez le Service de soutien technique.
- Veillez à ce que tous les blocs d'alimentation des appareils dotés de blocs d'alimentation multiples dans chaque unité soient allumés simultanément.
- Servez-vous de protecteurs de surtension ou de conditionneurs de lignes à courant alternatif lorsque vous mettez les appareils AMX AutoPatch sous tension.
- Placez uniquement des fusibles de calibre exact dans les boîtiers.
- Veillez à ce que la prise de courant soit proche de l'appareil et facile d'accès.
- Veillez à ce que votre appareil AMX AutoPatch soit installé sur une surface stable ou qu'il y soit fermement maintenu.
- Fermez toutes les composantes de l'équipement avant de relier des pièces, à moins d'indication contraire fournie dans la documentation de l'appareil.
- Par mesure de sécurité et pour la qualité des signaux, servez-vous d'une source d'alimentation externe mise à la terre et d'un connect d'alimentation mis à la terre.
- Pour éviter les chocs ou les dommages éventuels causés à l'équipement par une décharge électrostatique, veillez à ce le dispositif oit bien relié à la terre avant de toucher les composantes se trouvant à l'intérieur d'un appareil AMX AutoPatch.

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USFCC Notice

The United States Federal Communications Commission (in 47CFR 15.838) has specified that the following notice be brought to the attention of the users of this product.

Federal Communication Commission Radio Frequency Interference Statement:

"*This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturers instructions, may cause interference to radio and television reception. It has been type-tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However there is no guarantee that interference will not occur in a particular installation. If this equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- *Re-orient the receiving antenna*
- *Relocate the matrix with respect to the receiver*
- *Move the matrix away from the receiver*
- *Plug the matrix into a different outlet so that computer and receiver are on different branch circuits*

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the booklet, How to Identify and Resolve Radio-TV Interference Problems, *prepared by the Federal Communications Commission to be helpful*."

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, Stock N. 004-000-00345-4.

Use shielded cables. To comply with FCC Class B requirement, all external data interface cables and adapters must be shielded.

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Lithium Batteries Notice

Switzerland requires the following notice for products equipped with lithium batteries. This notice is not applicable for all AMX equipment.

Upon shipment of the products to Switzerland, the requirements of the most up-to-date Swiss Ordinance Annex 4.10 of SR 814.013 will be met by providing the necessary documents and annual reports relative to the disposal of the batteries to the Swiss Authorities.

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This manual uses the following conventions and icons to draw attention to actions or conditions that could potentially cause problems with equipment or lead to personal risk.



ESD Warning: *The icon to the left indicates text regarding potential danger associated with the discharge of static electricity from an outside source (such as human hands) into an integrated circuit, often resulting in damage to the circuit.*



Warning: *The icon to the left indicates text that warns readers against actions or conditions that could cause potential injury to themselves.*



Caution: *The icon to the left indicates text that cautions readers against actions that could cause potential injury to the product or the possibility of serious inconvenience.*

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Overview & General Specifications

Applicability Notice

The information in this manual applies to the following Precis LT Distribution Matrix models. To see other types of Precis systems, visit **www.amx.com**.

Precis LT Systems

Model	Configuration	Description
FGP37-0404-115	4x4	Composite Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0408-115	4x8	Composite Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0804-115	8x4	Composite Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0808-115	8x8	Composite Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0404-615	4x4	S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style
FGP37-0408-615	4x8	S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style
FGP37-0804-615	8x4	S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style
FGP37-0808-615	8x8	S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style
FGP37-0404-345	4x4	Component Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0408-345	4x8	Component Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0804-345	8x4	Component Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0808-345	8x8	Component Video with BNC, Stereo Audio with 5T Phoenix-style
FGP37-0404-A43	4x4	Component Video with RCA, Stereo Audio with RCA
FGP37-0408-A43	4x8	Component Video with RCA, Stereo Audio with RCA
FGP37-0804-A43	8x4	Component Video with RCA, Stereo Audio with RCA
FGP37-0808-A43	8x8	Component Video with RCA, Stereo Audio with RCA
FGP37-0404-844	4x4	RGBHV with HD-15, Stereo Audio with 3T Phoenix-style
FGP37-0408-844	4x8	RGBHV with HD-15, Stereo Audio with 3T Phoenix-style
FGP37-0804-844	8x4	RGBHV with HD-15, Stereo Audio with 3T Phoenix-style
FGP37-0808-844	8x8	RGBHV with HD-15, Stereo Audio with 3T Phoenix-style

Note: *All Precis LT systems have an integral front mounted control panel.*

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Product Notes

The Precis LT system is a compact, fixed, stand-alone routing system that is pre-engineered to fit in a broad range of video and audio environments. Precis LT systems route and distribute component HDTV and stereo audio simultaneously or separately. Several models available are designed to fit small to mid-range applications such as boardrooms, sports bars, video conferencing, retail, security, and portable command-and-control centers.

All Precis LT models are controllable from the featured front mounted control panel or any control device that can send and receive ASCII characters through an RS-232 serial cable.

Because the Precis LT is available in two sizes (1 RU and 2 RU) and various configurations, the illustrations in this manual may differ slightly from the model(s) you purchased.

Precis LT Features

- Ultra-flat video bandwidth curve measured at a tight ±3 dB
- Supports full Device Discovery through AMX's AutoPatch Duet module (firmware v.1.4.0 or higher is required; see FIG. 23 on page 27)
- RS-232 control port
- Supports AMX AutoPatch's simple BCS serial control protocol
- Breakaway to route video, audio, or video and audio
- Front panel security lockout
- Limited Warranty (see warranty at **www.amx.com** or on the *AMX AutoPatch CD*)
- 24-hour technical support

Precis LT Control Features

Several control options are available in addition to the standard front mounted control panel. Multiple control methods can be used on the same system.

- Standard front mounted control panel
- AMX Control Device (for control programming information, see the instruction manual for the specific interface)
- Ships with free APControl 3.0 software to provide single-user PC control of the Precis LT
- Optional TCP/IP control via an external APWeb module
- Supports AMX AutoPatch's simple BCS* (Basic Control Structure) serial control protocol
- Supports third-party controllers

* BCS is sent as ASCII characters through the Control port. For information on BCS commands, see the *BCS Protocol Instruction Manual* on the *AMX AutoPatch CD* or at **www.amx.com**.

Note: *Features and specifications described in this document are subject to change without notice.*

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Front View

The enclosure is the structural basis of Precis LT systems. All Precis LT systems have an integral front mounted control panel for controlling the system's switches and system attributes (FIG. 1). The control panel can also be used for system verification, redundant control, and troubleshooting. Directions for use are provided in the "Control Panel Operation" chapter on page 37. For additional control options, see page 12.

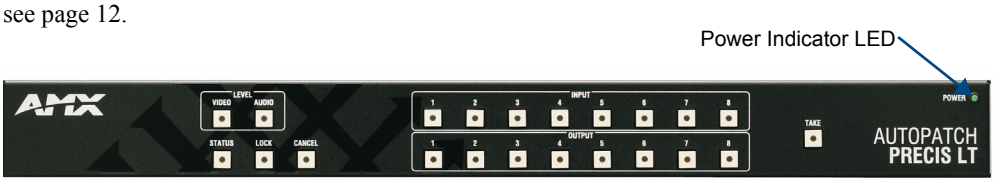
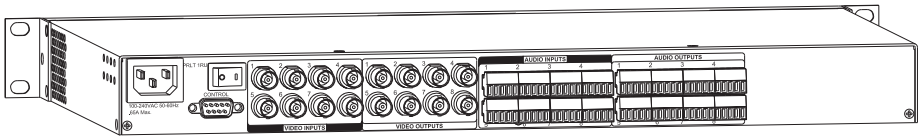


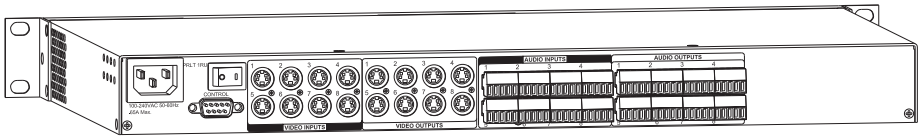
FIG. 1 Front view (8x8 model shown)

Rear View

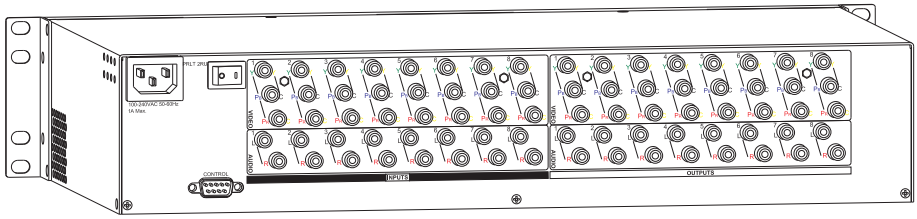
The enclosure's appearance, as viewed from the rear, will vary depending on the model type and the configuration.



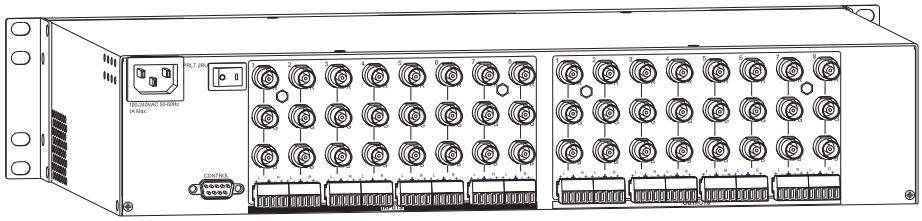
Precis LT 8x8 Composite Video with BNC, Stereo Audio with 5T Phoenix-style



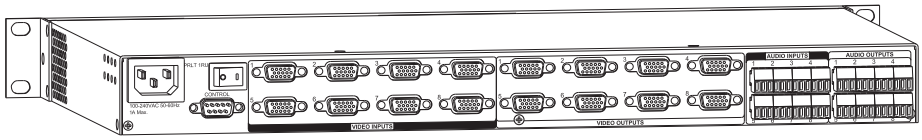
Precis LT 8x8 S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style



Precis LT 8x8 Component Video with RCA, Stereo Audio with RCA



Precis LT 8x8 Component Video with BNC, Stereo Audio with 5T Phoenix-style



Precis LT 8x8 RGBHV with HD-15, Stereo Audio with 3T Phoenix-style

FIG. 2 Precis LT rear views

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Rear View Components

- Control (serial) port
- Power receptacle, switch, and power specifications
- System serial number
- Input and output connectors

The following sections briefly introduce the hardware on the rear of the enclosure.

Control Port

Precis LT enclosures have a serial (RS-232) port, which is labeled “Control,” for attaching a PC or an external control device (FIG. 3).

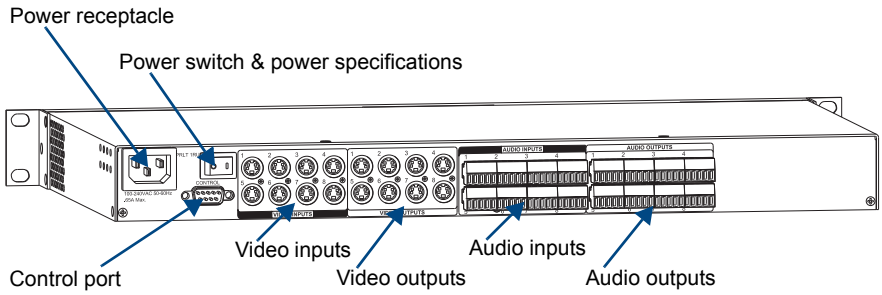


FIG. 3 Rear view components (Precis LT 8x8 S-Video with 4-pin DIN, Stereo Audio with 5T Phoenix-style model shown)

Power Receptacle and Switch

The universal power receptacle is in the upper left hand corner on the rear of the enclosure (FIG. 3). Maximum power specifications are between the power receptacle and the switch. The power receptacle will accept all major international standard power sources. (A standard US power cord is included with all shipments within the US.)

Input and Output Connectors

Input and output connectors are the attachment points for source and destination devices that connect to the system. Viewed from the rear, on some models video inputs and outputs are side-by-side on the left side of the enclosure and audio input and output connectors are side-by-side on the right. On other models, video inputs are above audio inputs on the left side of the enclosure and video outputs are above audio outputs on the right.

For specific information on the input and output connectors in your system, including cabling directions, see “Attaching Inputs & Outputs” on page 20.

Serial Number

Viewed from the rear, the system’s serial number is located on the left side of the enclosure near the power receptacle. Before installation, we recommend recording the system’s serial number in an easily accessible location.

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Precis LT General Specifications

General Specifications	
Parameter	**Value**
Approvals	CE, UL, cUL
Humidity	0 to 90% non-condensing
Operational Temperature	32° F to 110° F (0° C to 43° C)
Storage Temperature RGBHV + Stereo models	-4° F to +158° F (-20° C to +70° C)
AC Power	100 VAC to 240 VAC single phase, 50 Hz to 60 Hz
Dimensions Depth Width with rack ears Width without rack ears Height 2 RU models Height 1 RU models	 10.4 in. (26.42 cm) 19.0 in. (48.26 cm) 17.4 in. (44.20 cm) 3.5 in. (8.89 cm) 1.7 in. (4.32 cm)
Weight 2 RU models 1 RU models	 Approximately 10.5 lb. (4.76 kg) per enclosure Approximately 7.0 lb. (3.18 kg) per enclosure

Power & Thermal Dissipation Specifications	
Composite Video & Stereo Audio Models Power Consumption (max.) Power Consumption (typical) Thermal Dissipation (max.) Thermal Dissipation (typical)	 35 Watts 20 Watts per fully loaded enclosure 119 BTU/hr. 68 BTU/hr. per fully loaded enclosure
S-Video & Stereo Audio Models Power Consumption (max.) Power Consumption (typical) Thermal Dissipation (max.) Thermal Dissipation (typical)	 35 Watts 20 Watts per fully loaded enclosure 119 BTU/hr 68 BTU/hr. per fully loaded enclosure
Component Video & Stereo Audio Models Power Consumption (max.) Power Consumption (typical) Thermal Dissipation (max.) Thermal Dissipation (typical)	 60 Watts 35 Watts per fully loaded enclosure 205 BTU/hr. 119 BTU/hr. per fully loaded enclosure
RGBHV Video & Stereo Audio Models Power Consumption (max.) Power Consumption (typical) Thermal Dissipation (max.) Thermal Dissipation (typical)	 60 Watts 35 Watts per fully loaded enclosure 205 BTU/hr. 119 BTU/hr. per fully loaded enclosure

For individual signal information and specifications, see “Signal Specifications” on page 33.

AMX reserves the right to modify its products and their specifications without notice.

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Control Options

Levels for Switching

The Precis LT was pre-engineered at the factory to execute switches on VM 0 (the default level of audio-follow-video), VM 1 (video), and VM 2 (audio).

Front Mounted Control Panel

Precis LT systems can be controlled with the control panel (see "Control Panel Operation" on page 37) or with one of the following external control options.

AMX Control Devices

Precis LT enclosures are compatible with a number of AMX control devices. For control programming information, see the instruction manual for the specific interface.

Control Software

Precis LT enclosures can be controlled using AMX AutoPatch software:

- APControl 3.0 – Control and scheduling
  - Runs on a PC connected to the Control (serial) port on the enclosure
  - Download* from the *AMX AutoPatch CD*
- APWeb Server (TCP/IP) – Control, diagnostics, and third-party access
  - Uses the Control port on the enclosure for connecting to an APWeb Server Module
  - Accessed through a TCP/IP interface, such as, a web browser (e.g., Internet Explorer)
  - Contact AMX regarding limitations and conditions for operating a Precis LT on a company LAN (Local Area Network)

* If your AMX account has the required permissions, the program can be downloaded from **www.amx.com**.

BCS Serial Control Protocol

A Precis LT system can be controlled with an external serial controller that sends and receives ASCII characters via the Control port. AMX AutoPatch has developed a command language, BCS (Basic Control Structure) protocol, for programming control operations and for diagnostic purposes. BCS commands* can be entered into a terminal emulation program (e.g., HyperTerminal) running on a PC.

* For information on BCS commands, see the *BCS Protocol Instruction Manual* on the *AMX AutoPatch CD* or at **www.amx.com**.

Third-Party Controllers

A third-party controller can also be attached to a Precis LT enclosure via the Control port. If using a third-party controller, see the controller documentation for operating instructions.

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Installation & Setup

Site Recommendations

When placing the enclosure, follow the recommendations and precautions in this section to reduce potential installation and operation hazards.

Environment

- Choose a clean, dust free, (preferably) air-conditioned location.
- Avoid areas with direct sunlight, heat sources, or high levels of EMI (Electromagnetic Interference).
- To make control panel operation easier, mount the enclosure with the control panel in the rack at eye level.

Chassis Accessibility

Make sure the front is accessible, so that you can monitor the LED indicator. Leaving adequate clearance at the rear will also allow for easier cabling and service.

Power

The source's electrical outlet should be installed near the router, easily accessible, and properly grounded. Power should come from a building branch circuit. We recommend using a dedicated line for the system's power. Use a minimum breaker current rating of 15 A for 110 V or 30 A for 230 V.

To avoid an overload, note the power consumption rating of all the equipment connected to the circuit breaker before applying power.

General Hazard Precautions

These recommendations address potential hazards that are common to all installations:

Elevated Operating Temperature

The maximum rated ambient temperature for Precis LT enclosures is 110° F (43° C).

All equipment should be installed in an environment compatible with the manufacturer's maximum rated ambient temperature. In a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the ambient room temperature.



Caution: *To protect the equipment from overheating, do not operate in an area that exceeds 110° F (43° C) and follow the clearance recommendation below for adequate airflow.*

Airflow Restriction

Precis LT enclosures are designed to adequately dissipate the heat they produce under normal operating conditions; however, this design is defeated when high-heat producing equipment is placed directly above or below an enclosure.



Caution: *To prevent overheating, avoid placing high-heat producing equipment directly above or below the enclosure. The system requires a minimum of one empty rack unit above and below.*

Mechanical (Rack) Loading

When installing equipment in a rack, distribute the weight to avoid uneven mechanical loading.

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Circuit Overloading

When connecting the equipment to the supply circuits, be aware of the effect that overloading the circuits might have on over-current protection and supply wiring.

Reliable Earthing (Grounding)

Reliable earthing of rack-mounted equipment should be maintained. If not using a direct connection to the branch circuit (e.g., plugging into a power strip), pay particular attention to supply connections.

Caution: *For proper start up, turn on all power switches for the AMX AutoPatch equipment at the same time before applying power to the source and destination devices. We recommend attaching all power cords to a surge protector and/or an AC line conditioner.*

Unpacking

The Precis LT is shipped with one enclosure per shipping box. The invoice is sent separately; a packing list is attached to the outside of each box. Each box contains the following items:

- ❑ Enclosure
- ❑ Standard US power cord (if shipped within the US)
- ❑ Rack ears
- ❑ Other enclosure products as needed

The documentation in the first box includes:

- ❑ AMX AutoPatch Precis LT Quick Start Guide
- ❑ *AMX AutoPatch CD*

The shipping boxes are marked as "Chassis __ of __," where the first blank is the box number and the second blank is the total number of boxes in the shipment.

Unpacking Tips

- ❑ Before fully unpacking the enclosure(s), *inspect the shipping box(es) for any signs of damage*. If a box is partially crushed or any sides have been broken open, notify the shipping agency immediately and contact your AMX representative (see the warranty on the *AMX AutoPatch CD* or at **www.amx.com**).
- ❑ Once unpacking is complete, closely check the physical condition of the enclosure.
- ❑ Collect all documentation.

Note: *Please save the original shipping container and packing materials. AMX is not responsible for damage caused by insufficient packing during return shipment to the factory. Shipping boxes are available; contact your AMX representative for details.*

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Rack Installation & System Setup

The Precis LT Distribution Matrix enclosure can be mounted in a standard EIA 19 in. (48.26 cm) rack (rack ears are provided).

Important: *The system requires one empty rack unit above and below the enclosure to allow adequate airflow.*

Required items for rack installation:

- ❑ Enclosure
- ❑ Standard EIA 19 in. (48.26 cm) rack
- ❑ Rack ears
- ❑ Screwdriver
- ❑ Screws that fit your rack for mounting the enclosure
- ❑ Power cord

Optional items

- ❑ Surge-protector – highly recommended
- ❑ PC or laptop computer with a null modem cable (for communication with the Precis LT via the Control port)

Installation Recommendations

- ❑ Write the system's serial number in an easily accessible location before installing the Precis LT in a rack. Viewed from the rear, the system's serial number is located on the left side near the power receptacle.
- ❑ Use an earth-grounded power cord / system with the Precis LT.
- ❑ Attach the power cord to a surge protector and/or an AC line conditioner.
- ❑ Apply power to the Precis LT enclosure before applying power to its source and destination devices.

Installation Procedure

A flow chart showing the installation sequence is in FIG. 4. The procedure, which follows, provides general steps with references to detailed information found in later sections of the manual.

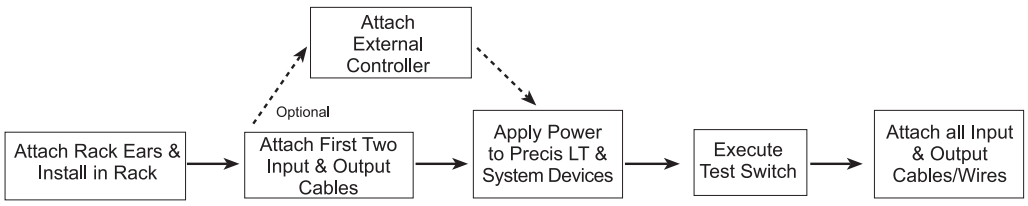


FIG. 4 Installation procedure

Caution: *To prevent overheating and airflow restriction, avoid placing high-heat producing equipment directly above or below the enclosure. The system requires a minimum of one empty rack unit above and below. Verify that the openings on the sides of the enclosure are not blocked and do not have restricted air flow.*

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To install and set up a Precis LT system in a rack:

1. On the side of the Precis LT, remove the bottom two screws closest to the front panel (FIG. 5).
   Align the holes on one of the rack ears with the empty holes on the side of the enclosure and replace the screws (three screws for the 1 RU; four screws for the 2 RU).
   Repeat for the other rack ear.

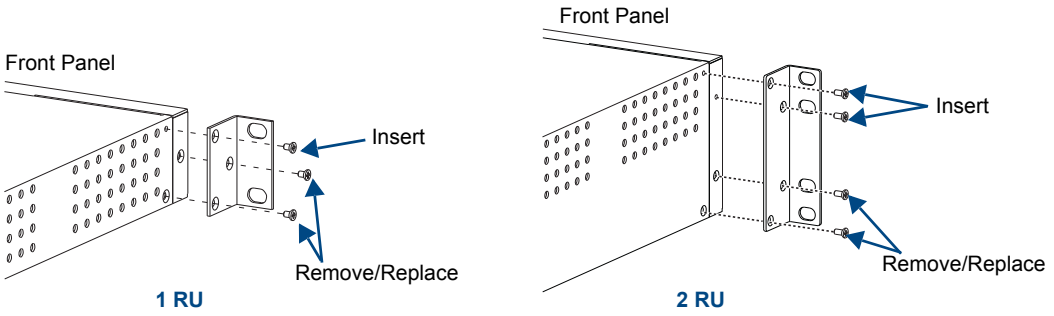


FIG. 5 Attach rack ears to sides of enclosure

2. Place the enclosure in the rack and attach front-mounting screws to hold it firmly in place.

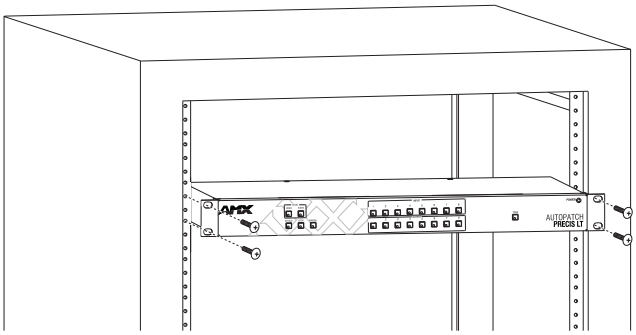


FIG. 6 Place enclosure in rack and secure with screws

Tip: *When placing enclosures, keep in mind that the optimal viewing angle for a control panel is eye level.*

3. Attach *only* the first two source devices and the first two destination devices; see "Attaching Inputs & Outputs" on page 20.
   Do not apply power to the devices until after the Precis LT has power (Step 5).
4. Optional – Establish communication with an external control device/system; see "Attaching an External Controller" on page 17.
5. Apply power to the system according to the power-up procedure; see "Applying Power & Startup" on page 26.

Note: *We recommend using surge protectors and/or AC line conditioners.*

6. Execute a test switch to ensure the system is working properly; see "Executing a Test Switch" on page 28.
7. When the test switch works correctly, attach the remaining source and destination devices.

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Attaching an External Controller

Note: *The Precis LT has a fixed configuration that was programmed at the factory.*

The Precis LT can be controlled externally by attaching an external control device using one of the following communication protocols to the Control port:

- BCS (Serial) – ASCII sent over a null modem serial cable
- XNNet – AMX AutoPatch protocol

Control Options

The communication protocols listed above are used for these control options:

AMX Control Devices

Precis LT enclosures are compatible with a number of AMX control devices. For control programming information, see the instruction manual for the specific interface.

APControl 3.0 (Serial)

APControl 3.0 software (for control and scheduling) runs on a PC connected to a Precis LT and is available on the *AMX AutoPatch CD*.

APWeb (TCP/IP)

The APWeb Server (for control, diagnostics, and third-party access) is accessed through a TCP/IP interface, such as a web browser (e.g., Internet Explorer). An APWeb Server module is required for APWeb. For setup and operation information, see the APWeb Server Module's documentation on the *AMX AutoPatch CD* and at **www.amx.com**.

Important: *Contact AMX regarding limitations and conditions for operating a Precis LT on a company LAN.*

XNNet Protocol (Serial)

Advanced programmers who want to design their own control programs can use AMX AutoPatch XNNet protocol. The *AMX AutoPatch CD* includes the XNNet Communication Library, an interface library that supports C, Java, and Visual Basic and has examples of the XNNet protocol in use.

BCS (Serial) Control

AMX AutoPatch has developed a command language, BCS (Basic Control Structure), for executing control operations and for diagnostic purposes. BCS commands are issued via a terminal emulation program, such as Windows® HyperTerminal. For information on BCS commands, see the *BCS Protocol Instruction Manual* on the *AMX AutoPatch CD* or at **www.amx.com**.

Third-Party Controllers (Serial)

If using a third-party controller, see the controller documentation for setup and operating instructions.

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Attaching Serial Controllers

An external serial controller is any device that can send and receive ASCII code over an RS-232 (null modem) serial cable attached to the Control port on the rear of the enclosure. PCs are common serial controllers. Once a PC is attached to the Precis LT, the system can be controlled by running APControl software on the attached PC (see the *AMX AutoPatch CD*). The system can also be controlled by entering BCS commands into a terminal emulation program (e.g., HyperTerminal). For information on BCS commands, see the *BCS Protocol Instruction Manual* on the *AMX AutoPatch CD* or at **www.amx.com**.

PC Requirements for APControl 3.0

- ❑ Windows XP Professional® or Windows 2000®
- ❑ Java Runtime Environment (JRE): v1.4.2 or the latest version
- ❑ Minimum Hardware: 166 MHz, 128 MB RAM, 20 MB free disk space, 800x600 display
- ❑ Recommended Hardware: 2.0 GHz, 512 MB RAM, 20 MB free disk space, 1280x1024 display
- ❑ Serial port

PC Requirements for BCS

- ❑ Windows XP Professional® or Windows 2000®
- ❑ Terminal emulation program
- ❑ Serial port

RS-232 Pin Diagram

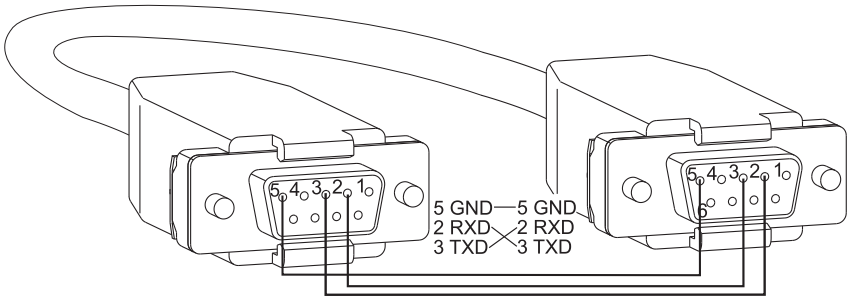


FIG. 7 RS-232 null modem pin diagram, no hardware flow control

To establish external serial control:

1. Use a null modem cable that matches the pin diagram in FIG. 7 for RS-232 without hardware flow control. AMX AutoPatch equipment requires pins 2, 3, and 5 only.
2. Plug one end of the null modem serial cable into the Control port on the enclosure (FIG. 8).

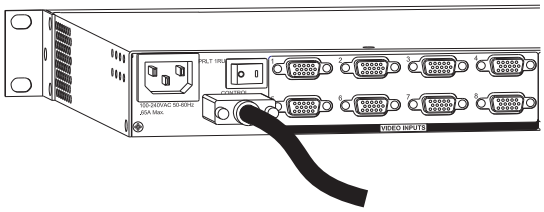


FIG. 8 Attach null modem serial cable to Control port

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3. Plug the other end of the serial cable into the serial port on the serial controller.
4. Open the serial communication software and set the port settings to match the Precis LT settings (see the table to the right).
   The settings on the PC serial communication software and the enclosure *must* correspond to each other. If a change is required to make them match, change the PC's settings.

Precis LT Control Port Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None



Caution: *To avoid system damage, follow the power-up sequence on page 26. We recommend attaching all power cords to surge protectors and/or AC line conditioners.*

5. If not already on, apply power first to the Precis LT enclosure and then to the source and destination devices (see "Applying Power & Startup" on page 26).
6. Setup and run the desired method of control:
   - **AMX Control Device** – For control programming information, see the instruction manual for the specific interface.
   - **APControl 3.0** – Install and open the program from the *AMX AutoPatch CD* (if your AMX account has the required permissions, the program can be downloaded from **www.amx.com**). From the APControl Launchbar menu, select System / New; select Heritage System / Next; select Manual Configuration Entry / Next; enter VMs and number of inputs and outputs; click Add VM / Next; finish Wizard instructions.
   - **Terminal emulation (HyperTerminal)** – Open the program, select the COM port, and check that the settings match those in the Precis LT Control Port Settings table (see above).
     Click OK.
     A short splash screen appears.
7. Execute a test switch to ensure the Precis LT is working properly (see "Executing a Test Switch," on page 28).

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Attaching Inputs & Outputs

On the rear of the enclosure, input and output connectors are the attachment points for source and destination devices that connect to the system. On some models video inputs and outputs are side-by-side on the left and audio input and output connectors are side-by-side on the right (FIG. 9). On other models, video inputs are above audio inputs on the left and video outputs are above audio outputs on the right.

The number and type of connectors depend on the signal type and system configuration. Input and output connectors are numbered separately. The connector numbers are either directly above or below each connector (or connector set) and read left to right.

Before connecting all input and output cables and wires, attach only the first two inputs and outputs and execute a test switch (see page 28). Depending on the signal type (e.g., three-component signals), you may need to attach multiple input and output connectors to route the entire signal.

When the test switch is successful, attach the rest of the input and output cables/wires.

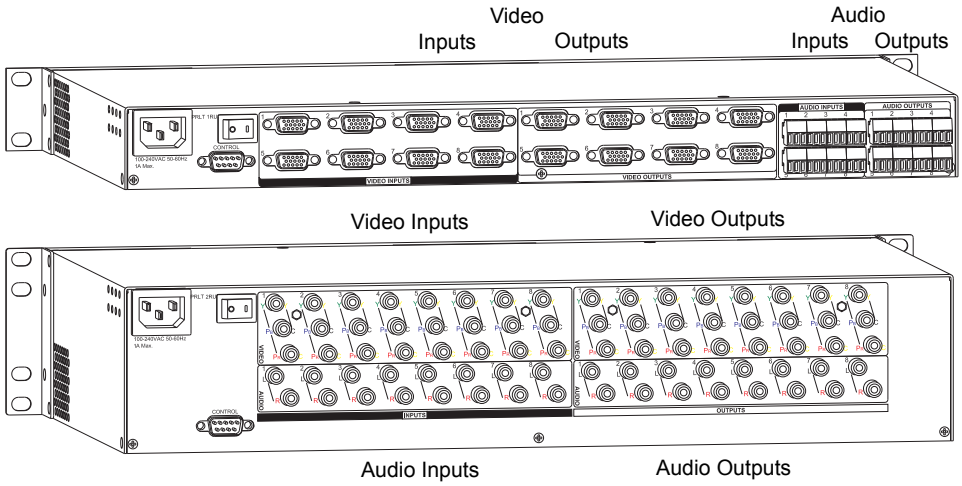


FIG. 9 Numbering starts at left for input & output connectors

Signal Types

Depending on the model, signal types and connectors for a Precis LT enclosure could include those listed in the table below.

Signal Type	Connector Type
Composite Video	RCA or BNC
S-Video	S-Video, locking S-Video
Three-component video (Y/Pb/Pr or RGsB)	RCA or BNC
RGBHV	HD-15
Stereo Audio (balanced or unbalanced)	RCA or pluggable 5-position terminal block
Stereo Audio (unbalanced)	Pluggable 3-position terminal block

For information and specifications for specific signals, see “Signal Specifications” on page 33.

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Attaching Video Cables

Standard Video

The video BNC connectors are color coded; the white BNC connectors are inputs and the black BNC connectors are outputs.

To attach BNC cables:

1. Fasten the cable connectors onto the input and output BNC connectors (FIG. 10).

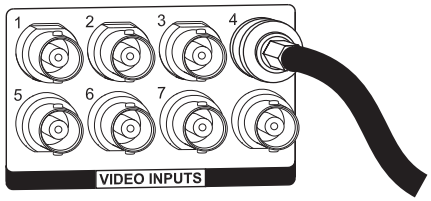


FIG. 10 Fasten cable connector onto BNC connector

S-Video

The Precis LT S-Video models are equipped with locking S-Video connectors. When used in conjunction with AMX AutoPatch manufactured S-Video cables, the cable connectors lock into the Precis LT connectors. Cables with standard S-Video connectors may be used, but will not lock.

To attach S-Video cables:

1. Fasten the cable connectors onto the input and output S-Video connectors (FIG. 11).

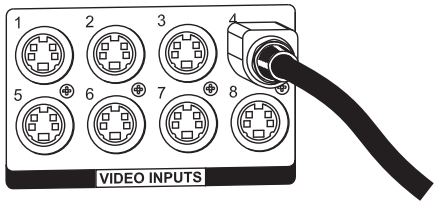


FIG. 11 Fasten cable connector to the S-Video connector

Caution: *The connector or the Precis LT may be damaged by pulling on the cable instead of the housing to remove a locking S-Video connector.*

To attach locking S-Video cables:

1. Hold the connector at a slight angle to the right while pushing in.
   Or
   Pull back on the housing of the connector (FIG. 12) while pushing the connector in.

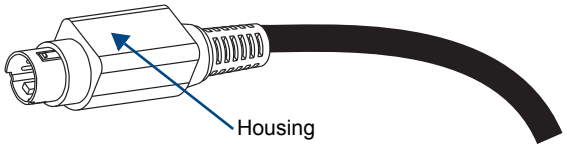


FIG. 12 Pull back housing to fasten or unfasten locking S-Video connectors

To remove locking S-Video cables:

Pull back on the housing of the connector (FIG. 12).

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Component Video (BNC)

You will need to attach cables to all corresponding video input and output connectors to route the entire video signal. In the connector option shown in FIG. 13, three BNC cables are attached for routing a three-component signal as Input 1.

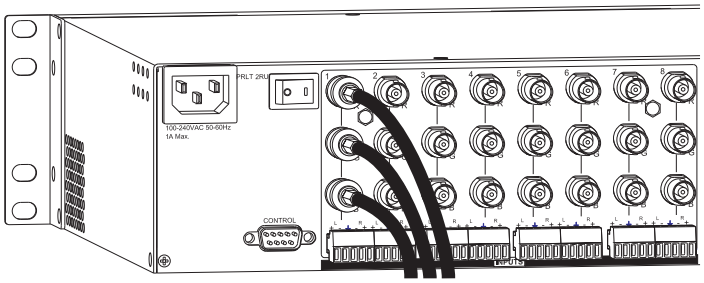


FIG. 13 Attach multiple cables to route entire video signal

To attach BNC cables:

1. Fasten the cable connectors onto the input and output BNC connectors.

RGBHV

To connect HD-15 cables:

1. Fasten the cables onto the input and output HD-15 connectors (FIG. 14).

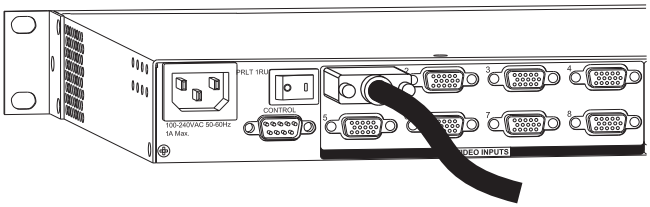
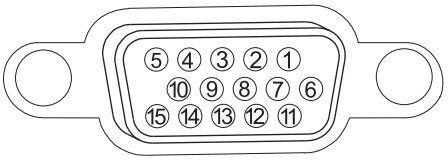


FIG. 14 Fasten cables onto HD-15 connectors

HD-15 Pinout

RGBHV/HD-15 connectors use the pinouts in FIG. 15.



Input (VESA DDC Compliant)

1. Red	6. Red GND	11. ID Bit
2. Green	7. Green GND	12. DDC SDA
3. Blue	8. Blue GND	13. Horizontal Sync
4. ID Bit	9. +5 V in DDC	14. Vertical Sync
5. GND	10. GND	15. DDC SCL

Output

1. Red	6. Red GND	11. ID Bit
2. Green	7. Green GND	12. ID Bit
3. Blue	8. Blue GND	13. Horizontal Sync
4. ID Bit	9. +5 V out DDC	14. Vertical Sync
5. GND	10. GND	15. ID Bit

FIG. 15 HD-15 input & output board connector pinout

Note: *55 mA supplied on output pin 9; power draw not to exceed 50 mA per port.*

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Attaching Audio Wires

The stereo audio connectors for the Precis LT are: pluggable 3-position terminal block (RGBHV with HD-15 models only), pluggable 5-position terminal block, and RCA. For information on 3-position and 5-position terminal block, see below. For information on RCA connectors, see page 25.

For stereo audio specifications, see “Signal Specifications” on page 33.

Standard Audio Connectors

Three-position terminal block connectors are wired for unbalanced (single-ended) stereo audio (FIG. 16). Five-position terminal block connectors can be wired for balanced (differential) or unbalanced (single-ended) stereo audio (FIG. 17).

Wiring Sources & Destinations

Source and destination devices require either balanced (differential) or unbalanced (single-ended) connections. FIG. 16 and FIG. 17 illustrate the options for wiring between sources and input connectors and between output connectors and the destinations. More than one option can be used in the same system. For 3-position and 5-position terminal block wiring instructions, see page 24.

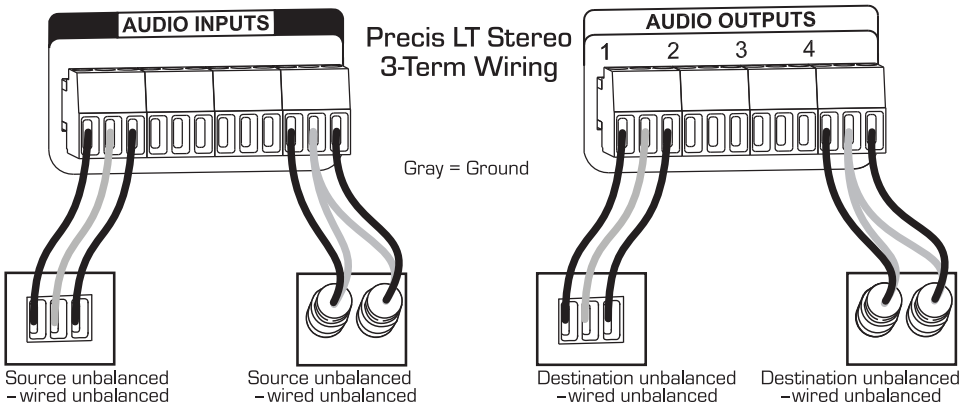


FIG. 16 Options for source-to-Precis LT-to-destination 3-Term wiring (RGBHV with HD-15 models only)

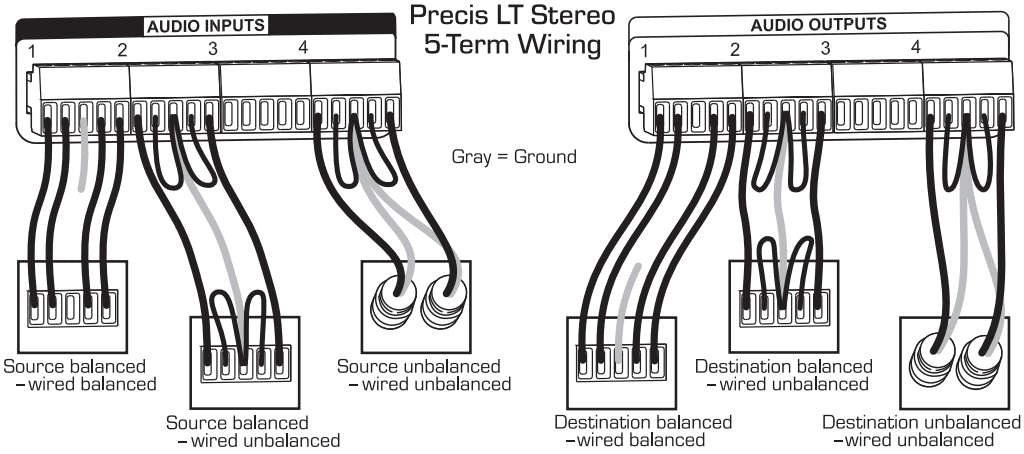


FIG. 17 Options for source-to-Precis LT-to-destination 5-Term wiring

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Stereo Audio 3-position Terminal Block – RGBHV with HD-15 Models Only

To attach stereo audio input and output wires:

1. Unscrew the clamps on the audio connector.
2. Insert the wires and firmly re-tighten the clamps to make secure connections.
   FIG. 18 shows wire placement for single-ended stereo.



FIG. 18 Insert wires & re-tighten clamps

Stereo Audio 5-Position Terminal Block

To attach stereo audio input and output wires:

1. Unscrew the clamps on the audio connector.
2. Insert the wires and firmly re-tighten the clamps to make secure connections.
   For balanced audio wire placement, see the left wiring diagram in FIG. 19.
   For unbalanced audio wire placement, see the right wiring diagram in FIG. 19.

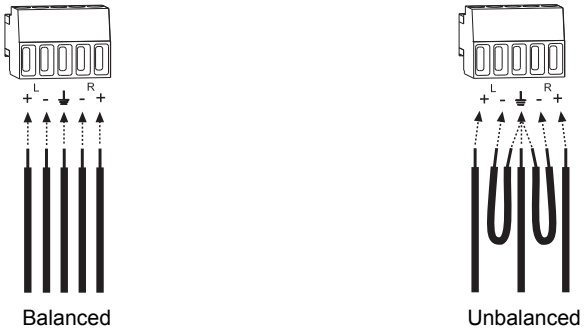


FIG. 19 Insert wires & re-tighten clamps

Note: *For stereo audio signals using twisted pair wire, connect the shield (ground) only at one end (recommend receiving end) to minimize low frequency noise.*

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Attaching Video & Audio RCA Cables

Precis LT Component Video models have two connector options: RCA jacks for both video and audio, or BNC video connectors and 5-position terminal block audio connectors.

RCA Video & Audio Connectors

You will need to attach cables to all corresponding video and audio input and output connectors to route the entire signal. In the connector option shown in FIG. 20, five RCA cables are attached for routing Y/Pb/Pr and stereo audio source signals as Input 1.

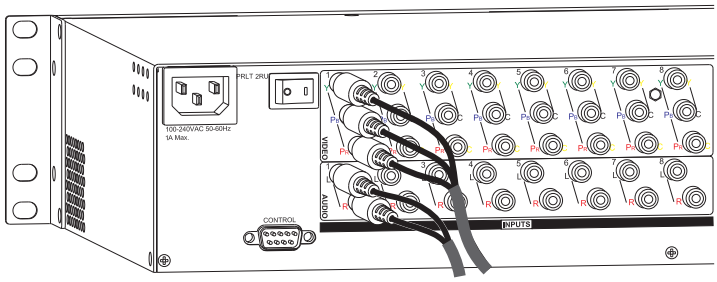


FIG. 20 Attach multiple cables to route entire signal

To attach RCA cables:

1. Insert the RCA plugs into the input and output RCA jacks.

Video Routing Options

Both RCA and BNC connector options can be cabled to route any one of the following video signals over each input or output (FIG. 21):

- Three component RGsB or Y/Pb/Pr video signals (attach cables to all three of the video connectors)
- Y/c signals (attach cables to the top two video connectors)
- A single composite signal (attach cable to the bottom video connector)

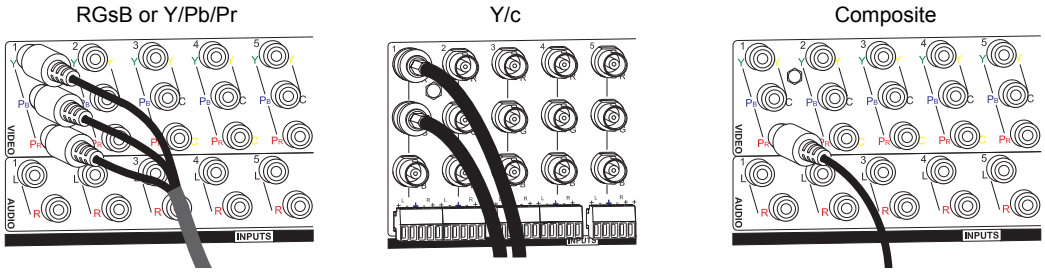


FIG. 21 Video routing options

Note: *The three connectors labeled for any given component signal will always switch together. Therefore, do not attach cables for different signal types (e.g., Y/c and composite signals), or attach more than one cable for a composite signal to any labeled set of three connectors (e.g., the three connectors labeled Input 1) for the entire system.*

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Applying Power & Startup

The enclosure's universal power receptacle will accept all major international standard power sources. Standard US power cords are provided for installations within the US. Maximum power specifications are on the power receptacle (also listed on page 11). Always use an earth-grounded power cord / system with a Precis LT.

The source electrical outlet should be installed near the Precis LT, easily accessible, and properly grounded. Power should come from a building branch circuit. We strongly recommend using a dedicated line for the system's power. Use a minimum breaker current rating of 15 A for 110 V or 30 A for 230 V. To avoid an overload, note the power consumption rating of all the equipment connected to the circuit breaker before applying power.

Caution: *To avoid system damage, turn on the power switch for the AMX AutoPatch equipment before applying power to the system's source and destination devices. We recommend attaching all power cords to a surge protector and/or an AC line conditioner.*

Power-Up Sequence

To apply power:

1. Attach the first two source and destination devices (see "Attaching Inputs & Outputs" on page 20). *Do not apply power* to the source and destination devices until Step 7.
2. If applicable – Attach an external controller (see "Attaching an External Controller" on page 17).
3. Plug one end of the power cord into a power strip *that is turned off* (we recommend using a 30 A power strip).
4. Plug the power cord into the power receptacle on the enclosure.
   Press the "I" side of the enclosure's power switch.
5. Turn on the power strip.
   The Power Indicator on the front of the enclosure illuminates (FIG. 22).



FIG. 22 Power indicator on control panel

6. If applicable– Apply power to the external control device/system.
7. Apply power to the source and destination devices.

For startup information on specific types of control *before* executing a test switch, see page 17.
The system is ready for a test switch (see "Executing A Test Switch" on page 28).

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Serial Control Device Startup

If you have not already done so, attach the serial control device to the Control port on the enclosure (see page 17) and open the control program.

AMX Control Devices

Precis LT enclosures are compatible with a number of AMX control devices. For control programming information, see the instruction manual for the specific interface.

APControl 3.0

If you are using APControl 3.0, install and open the program. Follow the directions in the setup wizard. From the Launchbar menu, select Views / CrossBar and click on the crosspoints to execute switches.

APWeb

For startup information, see the *APWeb Server Module* documentation.

HyperTerminal

When power is applied to the enclosure, HyperTerminal displays a short splash screen with information for your Precis LT model (FIG. 23). The system is ready to disconnect the factory default switch and to execute a test switch (see page 28).

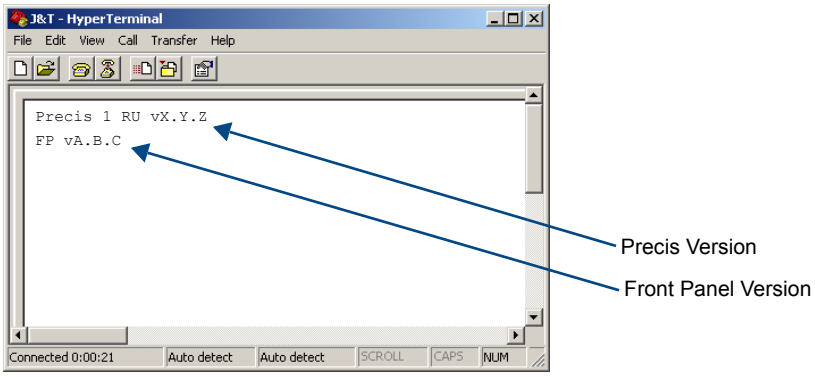


FIG. 23 Power-up splash screen in HyperTerminal

Note: *AMX reserves the right to change the contents and/or formatting of the splash screen at any time, without notice.*

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Executing a Test Switch

Execute a test switch to verify the system is working properly before attaching *all* inputs and outputs. Aside from having signal cables (and a controller if applicable) attached, the system is ready to execute switches when it ships from the factory.

Important: *The Precis LT ships from the factory with a default switch of Input 1 to all outputs. Before executing the test switch, you will need to disconnect the factory default switch.*

The first two source and destination devices must be attached to the input and output connectors (for specific connector information, see "Attaching Inputs & Outputs" on page 20). After the devices are connected, power *must* be applied to the enclosure first and then to the devices before executing a test switch.

You can execute a test switch from the following:

- Front mounted control panel
- AMX control device
- Control software such as APControl 3.0 or APWeb
- BCS (Basic Control Structure) commands over an external controller
- An external third-party controller

Executing a Test Switch

Before executing the test switch, make sure the first two source devices and the first two destination devices are connected to the correct input and output connectors.

Important: *Component signals require multiple input and output connectors (e.g., an RGsB signal requires three connectors). All of the signal cables for that signal (including audio if switching audio-follow-video) must be attached before executing the test switch.*

Control Panel

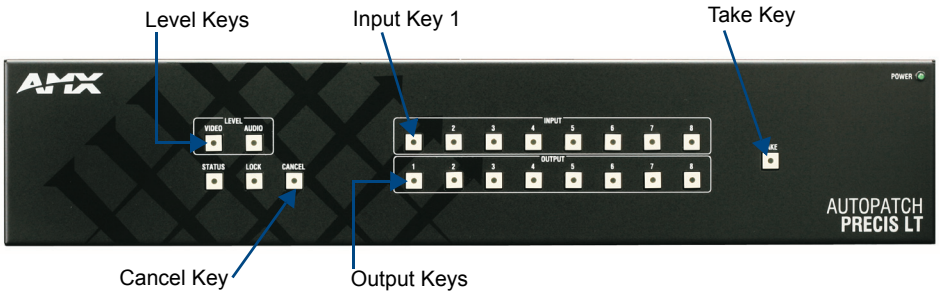


FIG. 24 Precis LT 8x8 control panel

To disconnect the factory default switch using the control panel:

1. Press the Cancel Key to put the Panel in Switch mode.
2. Press Input Key 1.
   The Video and Audio Level Keys illuminate.
   Input Key 1 flashes and all of the output keys illuminate. (If none of the output keys illuminate, press the Cancel Key and proceed to the following instructions to execute a test switch.)
3. Press each Output Key.
   The Output Keys each disconnect (turn off) when pressed.
4. Press the Take Key.
   All the illuminated keys turn off.
   Input 1 is disconnected from all outputs.

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If all the illuminated keys on the panel do not turn off, or if the Cancel Key flashes, the command was not successful. Press the Cancel Key to clear.

Regardless of the system response, execute the test switch. We recommend routing Input (source) 1 to Output (destination) 2 on Level 0 (video and audio).

To execute a test switch using the control panel:

1. Press Input Key 1.
   Both the Video and Audio Level Keys illuminate.
   Input Key 1 flashes.
2. Press Output Key 2.
   Output Key illuminates, indicating that it is ready to accept the switch.
3. Press the Take Key.
   All the illuminated keys turn off.
   Input 1 is routed to Output 2 on both levels.
   Verify that the source signal is present (visible and/or audible) at the destination.

If all the illuminated keys on the panel do not turn off, or if the Cancel Key flashes, the command was not successful. See the "Troubleshooting" section on page 30.

AMX Control Devices

For executing and disconnecting switches using an AMX control device, see the instruction manual for the specific interface.

APControl 3.0 or APWeb

Directions for executing and disconnecting switches using APControl 3.0 are found in its Help file. For directions for executing switches using APWeb, see the *APWeb Instruction Manual*.

BCS Commands

To enter BCS commands, attach the system to a serial control device running a terminal emulation program, e.g., Windows® HyperTerminal (see "Attaching an External Controller" on page 17). The settings on the PC serial communication software and the enclosure *must* correspond to each other. For settings information, see the table on page 19.

When using HyperTerminal, command characters are entered and sent to the enclosure's CPU. The command characters appear in HyperTerminal when the enclosure responds. When all of the entered characters appear in HyperTerminal, the command has been successfully executed.

To disconnect the factory default switch using BCS commands:

1. Enter the following BCS command line:
   `DL0I1T`

When the "`T`" appears, the system has successfully executed the command.

The following test switch routes Input 1 to Output 2 on Level 0.

To execute the test switch using BCS commands:

1. Enter the following BCS command line:
   `CL0I1O2T`

When the "`T`" appears, the system has successfully executed the command. If any other characters appear, the command was not successful. Verify that the source signal is present (visible and/or audible) at the destination.

For a complete list of BCS commands and responses, see the *BCS Protocol Instruction Manual* on the *AMX AutoPatch CD* or at **www.amx.com**.

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Troubleshooting

If the test switch did not execute correctly:

Start with...

- ❑ Check the power indicator on the front of the enclosure.
- ❑ If the power indicator is not illuminated, check the power switches and the power cords on the enclosure and on the source and destination devices.

Next, try...

Control Panel

- ❑ Reenter the command to see if the error was simply a timeout error.
- ❑ Verify the status of the switch. Press the Status Key, the Video Level Key, and Input Key 1. If Output Key 2 illuminates, the control panel has established an internal connection between the input and the output connectors.

BCS

- ❑ Check the command and reenter it.*
- ❑ Verify the status of the switch by entering `SI1T`. If `SI1T(2)` appears, the system established a connection between the input and the output connectors within the Precis LT enclosure.

Follow up with...

- ❑ Check all input and output cable connections on the rear of the enclosure and on the devices to ensure all connections are correct and secure.
- ❑ Attempt the switch again.
- ❑ Isolate source and destination equipment and cable problems by patching around the switcher using barrel connectors to check the overall signal path.
- ❑ Reconnect cables to the Precis LT and attempt the switch again.

Still need help?

- ❑ If the switch still does not work, contact technical support (see page 31).

* Often the command has simply been entered incorrectly (e.g., omitting an output in a Change command), or the command has specified a value that is not valid (e.g., entering an input or output number not available on the system).

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Technical Support

Before contacting technical support with a question, please consult this manual. If you still have questions, contact your AMX representative or technical support. Have your system's serial number ready. Viewed from the rear, the system's serial number is located to the left on the end of the enclosure.

We recommend recording your system's serial number in an easily accessible location.

AMX Contact Information

- 3000 Research Drive, Richardson, TX 75082
- 800.222.0193
- 469.624.8000
- Fax 469.624.7153
- Technical Support 800.932.6993
- www.amx.com

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Signal Specifications

Precis LT Composite Video & Stereo Audio Specifications

Applies to Precis LT models: FGP37-0404-115, FGP37-0408-115, FGP37-0804-115, and FGP37-0808-115.

Composite Video (Standard Video) Specifications

Standard Video Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 50 MHz or better ±1 dB to 15 MHz or better
Differential Gain	f = 3.58 MHz	<0.2% or better
Differential Phase	f = 3.58 MHz	<0.2º or better
Crosstalk	f = 5 MHz	<-65 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Input Level (max.)		±1.9 V
Input Impedance		75 ohms
Input Return Loss	f = 5 MHz	<-40 dB
Output Level (max.)		±1.9 V
Output Impedance		75 ohms
Connectors		BNC

Stereo Audio Specifications

Stereo Audio Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	f = 20 Hz to 20 kHz	<±0.1 dB
THD + Noise	f = 20 Hz to 20 kHz, Vin = -10 to +14 dBu	<0.025%
Crosstalk	f = 1 kHz, Vin = +2 dBu	<-105 dB
Signal to Noise Ratio (SNR)	f = 20 Hz to 20 kHz, Vin = +14 dBu	>105 dB
CMRR		>80 dB
Input Level (max.)	Balanced	+14 dBu
Input Impedance		18 kohms
Output Level (max.)	Balanced	+14 dBu
Output Impedance		50 ohms
Type		Balanced or unbalanced
Connectors		Pluggable 5-position terminal block

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Precis LT S-Video & Stereo Audio Specifications

Applies to Precis LT models: FGP37-0404-615, FGP37-0408-615, FGP37-0804-615 and FGP37-0808-615.

S-Video Specifications

S-Video Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 50 MHz or better ±1 dB to 15 MHz or better
Differential Gain	f = 3.58 MHz	<0.2% or better
Differential Phase	f = 3.58 MHz	<0.2º or better
Crosstalk	f = 5 MHz	<-65 dB
Channel Separation	f = 5 MHz	<-60 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Input Level (max.)		±1.9 V
Input Impedance		75 ohms
Input Return Loss	f = 5 MHz	<-35 dB
Output Level (max.)		±1.9 V
Output Impedance		75 ohms
Connectors		S-Video, Locking S-Video

Stereo Audio Specifications

Stereo Audio Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	f = 20 Hz to 20 kHz	<±0.1 dB
THD + Noise	f = 20 Hz to 20 kHz, Vin = -10 to +14 dB	<0.025%
Crosstalk	f = 1 kHz, Vin = +2 dBu	<-105 dB
Signal to Noise Ratio (SNR)	f = 20 Hz to 20 kHz, Vin = +14 dBu	>105 dB
CMRR		>80 dB
Input Level (max.)	Balanced	+14 dBu
Input Impedance		18 kohms
Output Level (max.)	Balanced	+14 dBu
Output Impedance		50 ohms
Type		Balanced or unbalanced
Connectors		Pluggable 5-position terminal block

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Precis LT Component Video & Stereo Audio Specifications

Applies to Precis LT models: FGP37-0404-345, FGP37-0408-345, FGP37-0804-345, FGP37-0808-345, FGP37-0404-A43, FGP37-0408-A43, FGP37-0804-A43, and FGP37-0808-A43.

Component Video (Wideband Video) Specifications

Wideband Video Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 300 MHz or better ±1.5 dB to 100 MHz or better
Differential Gain	f = 3.58 MHz	<0.2% or better
Differential Phase	f = 3.58 MHz	<0.2º or better
Crosstalk	f = 5 MHz f = 30 MHz f = 150 MHz	<-70 dB <-60 dB <-35 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Return Loss (BNC)	f = 5 MHz	<-45 dB
Return Loss (RCA)	f = 5 MHz	<-42 dB
Input Level (max.)		±1.5 V
Input Impedance		75 ohms
Output Level (max.)		±1.5 V
Output Impedance		75 ohms
Connectors		RCA or BNC

Stereo Audio Specifications

Stereo Audio Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	f = 20 Hz to 20 kHz	<±0.1 dB
THD + Noise	f = 20 Hz to 20 kHz, Vin = -10 dB to +14 dB	<0.025%
Signal to Noise Ratio (SNR)	f = 20 Hz to 20 kHz, Vin = +14 dB	>105 dB
Crosstalk	f = 1 kHz, Vin = +2 dBu	<-105 dB
CMRR		>80 dB
Input Level (max.)	Balanced and unbalanced	+14 dBu
Input Impedance		18 kohms
Output Level (max.)	Balanced and unbalanced	+14 dBu
Output Impedance		50 ohms
Type		Balanced (5-Term) or Unbalanced (RCA or 5-Term)
Connectors		Pluggable 5-position terminal block or RCA

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Precis LT RGBHV Video & Stereo Audio Specifications

Applies to Precis LT models: FGP37-0404-844, FGP37-0408-844, FGP37-0804-844, and FGP37-0808-844.

RGBHV Video (Wideband Video) Specifications

Wideband Video Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 300 MHz or better ±1.5 dB to 100 MHz or better
Crosstalk	f = 5 MHz f = 30 MHz f = 150 MHz	<-65 dB <-50 dB <-40 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Input Level (max.)		±1.5 V
Input Impedance		75 ohms
Return Loss	f = 5 MHz	<-42 dB
Output Level (max.)		±1.5 V
Output Impedance		75 ohms
HV Sync Input Level (max.)		±5 V
HV Sync Input Impedance		22 kohms
HV Sync Output Level	Follows input	±5 V
HV Sync Output Impedance		75 ohms
Connectors		HD-15

Stereo Audio Specifications

Stereo Audio Signal Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	f = 20 Hz to 20 kHz	<±0.1 dB
THD + Noise	f = 20 Hz to 20 kHz, Vin = -10 dB to +14 dB	<0.025%
Crosstalk	f = 1 kHz, Vin = +2 dBu	<-105 dB
Signal to Noise Ratio (SNR)	f = 20 Hz to 20 kHz, Vin = +14 dBu	>105 dB
Input Level (max.)	Unbalanced	+14 dBu
Input Impedance		18 kohms
Output Level (max.)	Unbalanced	+14 dBu
Output Impedance		50 ohms
Type		Unbalanced
Connectors		Pluggable 3-position terminal block

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Control Panel Operation

All Precis LT systems have an integral front mounted control panel for controlling the system's switches and system attributes. The control panel can also be used for system verification and redundant control. FIG. 25 illustrates a Precis LT 8x8 control panel. Other models may vary slightly in appearance.

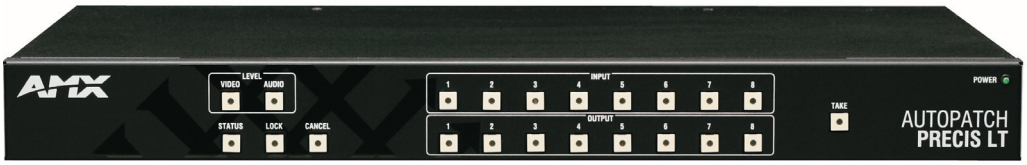


FIG. 25 1 RU Precis LT 8x8 control panel

Note: *AMX AutoPatch software can also be used to control a system; for more information, see the "AMX AutoPatch CD." In addition, AMX AutoPatch enclosures can be controlled using BCS (Basic Control Structure) commands transmitted through an external controller; for more information, see the "BCS Protocol Instruction Manual" on the CD or at* ***www.amx.com***.

Modes of Operation

A Precis LT control panel works in three standard modes:

- Switch (default) – use to execute switches
- Status – use to verify signal status
- Lock – use to lock and unlock the control panel (password required)

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Control Keys

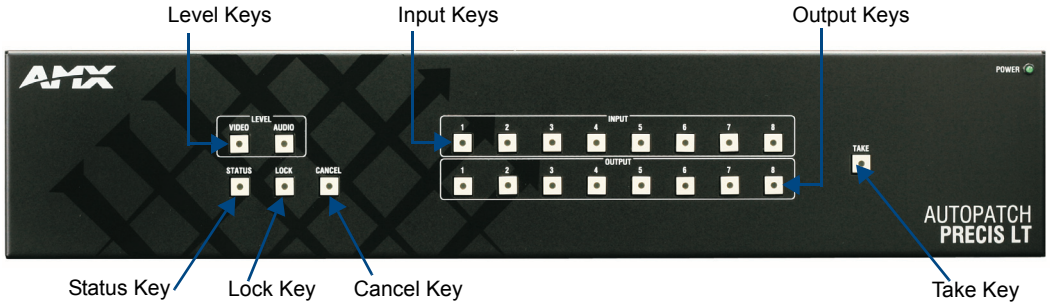


FIG. 26 2 RU Precis LT 8x8 control panel keys

Keys & Functions

- Status Key – places the control panel in Status mode.
- Lock Key – locks and unlocks the control panel (password required).
- Cancel Key – cancels an incomplete command and returns panel to Switch mode. Cannot undo a completed operation, i.e., an operation followed by the pressing of the Take Key.
- Take Key – functions like the "Enter" key on a computer key board. Pressing the Take Key instructs the system to complete an operation. Does not illuminate when pressed.
- Level Keys – activate levels for switches or status queries.
  In the default switch state, both Video and Audio Level Keys are illuminated and video and audio signals are simultaneously routed.
  When one Level Key is illuminated, it indicates which level (video or audio) is selected; either video signals only or audio signals only are routed.
  Input (source) Keys – select an input on the selected level, also can be used for entering the password in Lock mode.
- Output (destination) Keys – select an output on the selected level, also can be used for entering the password in Lock mode.

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Executing & Disconnecting Switches

A switch is an active connection between an input (source) signal and one or more output (destination) devices. The signals routed in a switching operation are individual signals or groups of individual signals coming through the connectors on the rear of the enclosure. You can execute switches from the control panel using the steps below.

Switching Level

All switches are executed on a specific level. Unless otherwise specified, switches are executed using the factory designated default level of video and audio which is associated with both Level Keys illuminating. When using the default, you do not need to press a Level Key.

When executing a switch on a level other than the default, you must press the desired Level Key (be sure the level includes the signals you want to route).

The Level Key for the level currently in use will illuminate when your press an Input Key or an Output Key. The level can be changed by pressing the desired Level Key either before or after you press an Input Key or an Output Key.

Description of Switching / Disconnecting Operations in Switch Mode

Pressing the Cancel Key puts the control panel in Switch mode, which defaults to switching both video and audio. For information on changing the level, see “Switching Level” above.

- When an Input Key is pressed first, it flashes and will be used as the source for switching. A single Output Key can then be pressed (the key will illuminate, indicating that it is ready to accept the switch). Pressing the Take Key instructs the system to execute or disconnect the switch. (The Take Key does not illuminate when pressed.)
- When an Output Key is pressed first, it flashes and is ready to accept an input signal. Press the Input Key, which illuminates. Press the Take Key to complete the switch.
  Additional switches and disconnects can be executed while in Switch mode.

Executing Switches

When executing switches, the flashing key is the “hot” Input or Output Key, all other commands center around that key until you change mode (press the Cancel Key), level, or select a different Input or Output Key (must be the same type of key as the “hot’ key).

Be sure to read the information on “Switching Level” above.

You can return to the Switch mode at any time by pressing the Cancel Key. Pressing the Cancel Key does not cancel any completed operations.

To execute a switch selecting input (source) first:

1. Press the Cancel Key.
   All the lights on the control panel turn off.
   The control panel is in Switch mode.
2. Press a Level Key to select a level (can be omitted when switching on the default level).
   The Level Key illuminates.
3. Press an Input Key to select an input.
   The Input Key flashes, and after a moment any Output Key(s) to which that signal is already routed illuminates.
4. Press an Output Key(s) that is not illuminated to select an output(s).
   The selected key illuminates, indicating that it is ready to accept the signal from the input.
5. Press the Take Key.
   All the illuminated keys turn off as the switch is executed.

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Note: *When executing a switch, you can select multiple outputs, but only one input. To select multiple outputs, you must select the input first (see previous section).*

To execute a switch selecting output (destination) first:

1. Press the Cancel Key.
   All the lights on the control panel turn off.
   The control panel is in Switch mode.
2. Press a Level Key to select a level (can be omitted when switching on the default level).
   The Level Key illuminates.
3. Press an Output Key to select an output.
   The Output Key flashes, and after a moment if an Input Key is already routed to it, the Input Key illuminates.
4. Press an Input Key to select an input.
   The selected key illuminates, indicating that it is ready to accept the signal from the input.
5. Press the Take Key.
   All the illuminated keys turn off as the switch is executed.

Disconnecting Inputs & Outputs

Disconnecting a switch deactivates the connection between an output (destination) device and the input (source) signal that is routed to it. An output can only be connect to one input; therefore, disconnecting an output only disconnects that connection. If the input is routed to additional outputs, those connections remain routed.

Be sure to read the information on “Switching Level” on page 39.

You can return to the Switch mode at any time by pressing the Cancel Key. Pressing the Cancel Key does not cancel any of the disconnects that were just completed.

Note: *To disconnect multiple outputs from an input, use the “Press an Input Key” option in Step 3 below.*

To disconnect inputs and outputs:

1. Press the Cancel Key.
   All the lights on the control panel turn off.
   The control panel is in Switch mode.
2. Press a Level Key to select a level (can be omitted when switching on the default level).
   The Level Key illuminates.
3. Press an Input Key.
   The Input Key flashes, and all the Output Keys the input is routed to illuminate.
   Press the illuminated Output Key(s) to disconnect the output(s) from the input.
   Each Output Key turns off when pressed.
   Press the Take Key.
   All the illuminated keys turn off.
   The selected outputs are disconnected from the input. Any output keys that were still illuminated when you pressed the Take Key are still connected.
   Or
   Press an Output Key.
   The Output Key flashes, and the Input Key it is receiving a signal from illuminates.
   Press the Input Key.
   Press the Take Key.
   All the illuminated keys turn off.
   The output is disconnected from the input. (Additional outputs may still be connected to the input.)

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Verifying Signal Status

Signal status can be verified to confirm that a switch has executed properly or to confirm correct routing to multiple outputs (destinations) without accidently executing or disconnecting switches. The Precis LT control panel can verify both input and output signal status.

Verifying an input will illuminate all outputs currently receiving the input's signal. Verifying an output will only illuminate its current input (an output can only be connected to one input). The illuminated input will not show other outputs that are also connected. If no signals are connected to the input or output in question, only the input or output key being checked will illuminate.

The system *will not* verify the status for a video and an audio signal simultaneously. To verify that a signal is being routed on both levels, verify the switch on each level independently. Signal status must be checked on the level that switches its signal type, e.g., a video signal can only be verified on the Video Level. Check that the system is on the same level as the signal being verified by illuminating the corresponding Level Key:

- Video Level Key – verifies routing status for video signals.
- Audio Level Key – verifies routing status for audio signals.

You can return to Switch mode at any time by pressing the Cancel Key.

To verify the status of a signal:

1. Press the Status Key to put the control panel in Status mode.
   The Status Key illuminates and all other keys on the control panel turn off.
2. Press a Level Key to select a level.
   The Level Key illuminates.
3. Press an Input Key that corresponds to the input you want to check.
   The selected Input Key illuminates and the Output Keys for the outputs receiving that input signal illuminate.
   If no Output Keys illuminate, the signal is not routed or is not available on that level.
   Or
   Press an Output Key that corresponds to the output you want to check.
   The Output Key illuminates, and the Input Key for the input currently routed to that output illuminates.
   If no Input Key illuminates, no signal is routed on that level.
4. Select another input or output to verify.
   Or
   Press the Cancel Key to return to Switch mode.

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Locking & Unlocking the Control Panel

Locking the Precis LT control panel prohibits access to the system and can prevent accidental switching. While the panel is locked, BCS commands still work; however, they cannot be used to unlock the panel.

The password is a sequence of five key presses using any combination of Input and/or Output Keys.

Note: *Although a new password could be used each time, we recommend using the same password and keeping a written record of it in a in a convenient place.*

After you press the Lock Key, you have 10 seconds to enter a password before the panel reverts to its previous mode (Locked or Switch mode). If you enter the wrong password, press the Lock Key again and enter the correct password.

If power is turned off while the panel is locked, all password information will be lost. When power is reapplied, the panel will be unlocked.

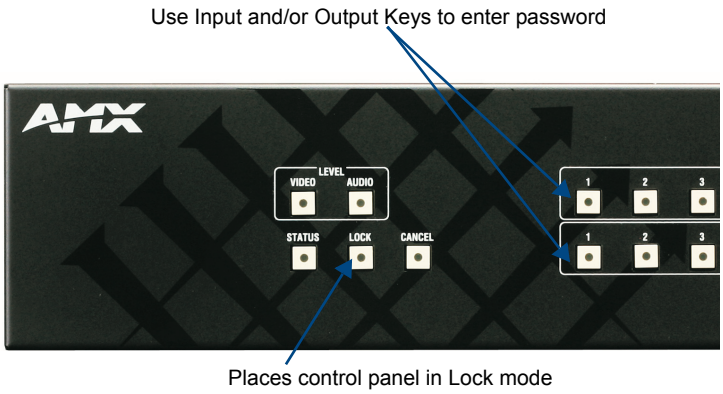


FIG. 27 Use Input/Outputs Keys to lock & unlock panel

For the following example, the password is “1 3 1 2 2” using the Input Keys.

To lock the control panel:

1. Press the Lock Key.
   The Lock Key flashes for 10 seconds. You *must* enter the password before the Lock Key stops flashing.
2. Press the Input Keys in this order: 1, 3, 1, 2, 2.
3. Press the Take Key.
   The Lock Key stops flashing but remains illuminated.
   The control panel is locked.

To unlock the control panel:

1. Press the Lock Key.
   The Lock Key flashes for 10 seconds. You *must* enter the password before the Lock Key stops flashing.
2. Press the Input Keys in this order: 1, 3, 1, 2, 2.
3. Press the Take Key.
   The Lock Key turns off.
   The control panel is unlocked and in Switch mode.

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