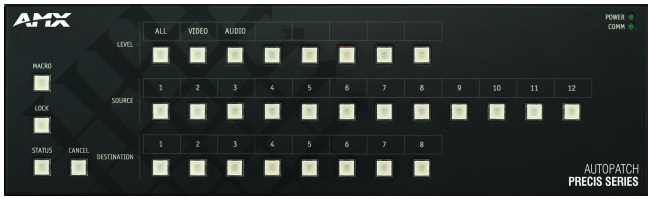
Instruction Manual

Precis

Distribution Matrix



Matrix Switchers

Revised: 11/16/2007

NOTICES

No patent liability is assumed with respect to the use of information contained herein.

While every precaution has been taken in the preparation of this publication, AMX assumes no responsibility for error or omissions. No liability is assumed for damages resulting from the use of the information contained herein.

Further, this publication and features described herein are subject to change without 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.

X^NNet is a communication protocol that provides software communications support for Ethernet and Neuron interfaces.

Precis, AutoPatch, and X^NConnect are trademarks of AMX.

TosLink is a registered trademark of the Toshiba Corporation.

MS-DOS, Windows, and Windows95 are registered trademarks of Microsoft Corporation.

Neuron and LonTalk are registered trademarks of Echelon.

IMPORTANT SAFETY INFORMATION AND 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 be done only 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.
- Turn off and unplug an enclosure before adding or removing boards, unless otherwise specified in that product's documentation.
- 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.
- 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.

INFORMATIONS ET DIRECTIVES DE SÉCURITÉ IMPORTANTES

Veuillez respecter les directives de sécurité décrites ci-dessous, lorsque vous installez et utilisez votre appareil AMX AutoPatch. Veuillez consulter la documentation accompagnant l'appareil pour de plus amples informations à propos de l'installation, du fonctionnement ou de la réparation de votre appareil AMX AutoPatch.

- Lisez attentivement toutes les directives avant d'installer et d'utiliser les appareils AMX AutoPatch.
- La tension d'alimentation doit être appropriée pour l'appareil AMX AutoPatch.
- Les appareils AMX AutoPatch ne contiennent aucun composant réparable par l'utilisateur ; toute réparation ne peut être effectuée que par des techniciens qualifiés.
- Si de la fumée ou des odeurs étranges se dégageraient d'un appareil AMX AutoPatch, éteignez-le immédiatement et contactez le Service de support technique.
- Eteignez l'appareil et débranchez-le, avant d'ouvrir le boîtier pour y ajouter ou enlever des cartes électroniques, à moins qu'une instruction dans la documentation de l'appareil n'indique le contraire.
- Assurez-vous que l'appareil soit bien relié à la terre avant de toucher les composantes se trouvant à l'intérieur d'un appareil AMX AutoPatch, pour éviter des décharges électrostatiques pouvant provoquer des dommages à l'équipement.
- Assurez-vous que toutes les unités d'alimentation des appareils dotés d'unités d'alimentation multiples soient allumés simultanément dans chaque unité.
- Servez-vous de protecteurs de surtension ou de conditionneurs de lignes de courant alternatif lorsque vous mettez les appareils AMX AutoPatch sous tension.
- N'utilisez que des fusibles de calibre exact dans les boîtiers.
- Veillez à ce que la prise de courant soit proche de l'appareil et facile à accéder.
- Veillez à ce que votre appareil AMX AutoPatch soit installé sur une surface stable ou qu'il y soit fermement maintenu.
- Fermez tous les composants de l'équipement avant de les connecter, à moins qu'une instruction de cette documentation n'indique le contraire.
- Par mesure de sécurité et pour assurer la qualité des signaux, servez-vous d'une source d'alimentation externe mise à terre et d'un cordon d'alimentation avec mise à terre.

Supplement: Ethernet Connector LEDS

CONTENTS

WELCOME

Welcome to the Precis User's Operation Manual. This manual contains quick, easy-to-follow instructions for operating a Precis™ Distribution Matrix from the Control Panel and from a serial control device that supports BCS (Basic Control Structure) commands.

This document does not include any detailed information about SBCs (Single Bus Controllers) or remote control panels for the Precis. Call technical support for more information about these controller types (see "Technical Support" on this page).

TERMS TO KNOW

BCS (Basic Control Structure)
BCS is a set of alphanumeric characters that combine to form command lines. Use BCS command lines to control a system from any serial device that connects to the serial connector on the enclosure and allows you to enter characters – such as a PC (personal computer). BCS commands are a subset of the X^NNet communications protocol.

Control Panel
A Control Panel (optional) is attached to an enclosure and is designed for controlling a Precis Distribution Matrix.

Level
A level is a set of signals that usually switch together; for example, a stereo audio level could be comprised of left and right audio signals that usually switch together.

Macro
A macro is a predetermined set of switches that always occur together. Executing a macro is a shortcut for executing that set of switches.

Signal
A signal can be analog audio, analog video, serial digital, sync information, or other types. A source or destination signal (also called input and output signals) can be comprised of a set of connectors whose signals switch together, such as an "RGBHV" signal. To route a specific source signal to a specific destination, the source and destination must be the same signal type and must reside in the same level.

Source and Destination Connectors
Source and destination connectors are on the rear of an enclosure. Source and destination signal cables attach to the source and destination connectors. Standard Precis audio connectors are 5-position screw terminal block; video connectors are BNC.

Switch
A switch is an active connection between a source signal and one or more destinations.

X^NNet
X^NNet is a communication protocol which provides software communications support for AMX AutoPatch products as well as other products manufactured by AMX. It includes several subsets, one of which is the BCS command set used by the Precis series™. The X^NNet protocol supports a wide variety of physical interfaces, such as standard serial RS232, Ethernet, LonTalk®, Neuron®, and others.

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 serial number (normally located on the rear of the enclosure) ready. We recommend recording the serial number in an easily accessible location.

AMX Contact Information

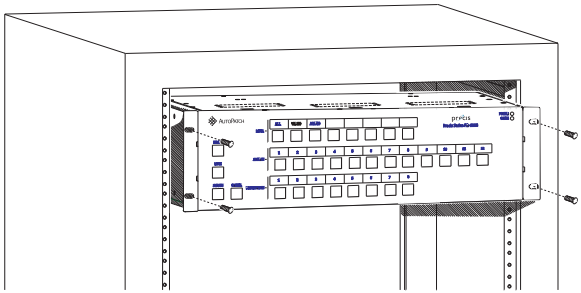
- 3000 Research Drive, Richardson, TX 75082
- 800.222.0193
- 469.624.8000
- Fax 469.624.7153
- Technical Support 800.932.6993
- www.amx.com

INSTALLING A PRECIS ENCLOSURE

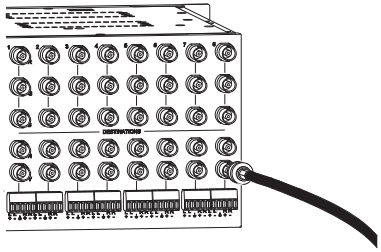
Precis enclosures are designed to fit in a standard EIA 19 in (48.26 cm) rack. Each enclosure comes with the following items in the box:

- ❑ Enclosure
- ❑ Precis User's Operation Manual
- ❑ Power Cord

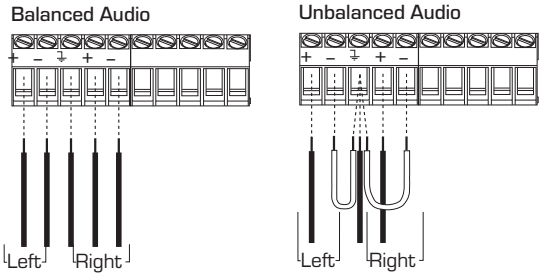
1 Place the Precis enclosure in a rack and fasten with mounting screws.



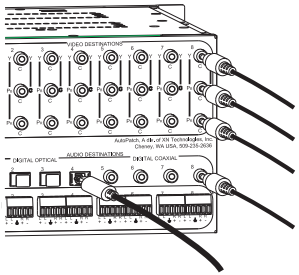
2 Attach all source and destination cables (types of connectors vary according to model).



BNC connectors



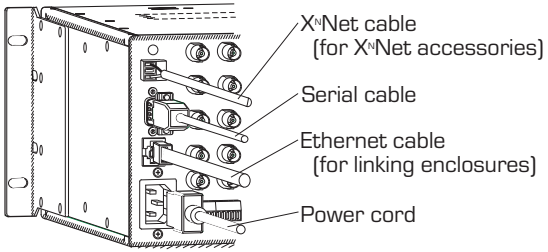
5-position, screw terminal audio connectors



Optical and coaxial connectors

Note: Digital optical (TosLink® compatible) and digital coaxial (S/PDIF compatible) inputs switch only to digital optical and digital coaxial outputs.

3 Attach a null modem serial cable (pinout on next page) and the power cord (plugging in the power cord turns on the enclosure). Make sure the power outlet is close to the enclosure and is easily accessible.



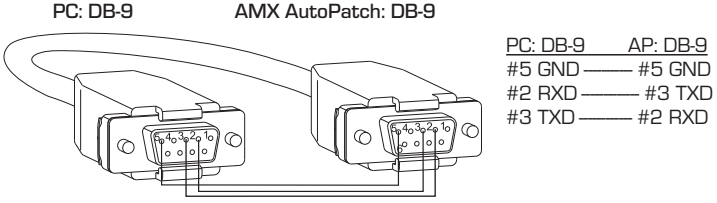
CPU connections vary according to model

External Control Serial Port Settings

Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None

RS-232 Pinout – All Precis Models

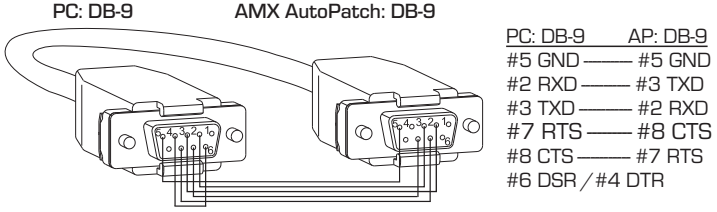
Use a null modem cable that matches the pinout diagram below for RS-232 without hardware flow control. AMX AutoPatch equipment requires pins 2, 3, and 5 only.



No hardware flow control

Optional RS-232 Pinout with Hardware Flow Control – Precis 500 MHz Only

Use a null modem cable that matches the pinout diagram below for RS-232 with hardware flow control on the Precis 500 MHz.



Hardware flow control

4. Make sure the enclosure is working properly by executing a switch (see "Executing and Disconnecting Switches" on page 11).

   If the enclosure is not working properly, contact technical support (see page 5).

LINKING PRECIS ENCLOSURES

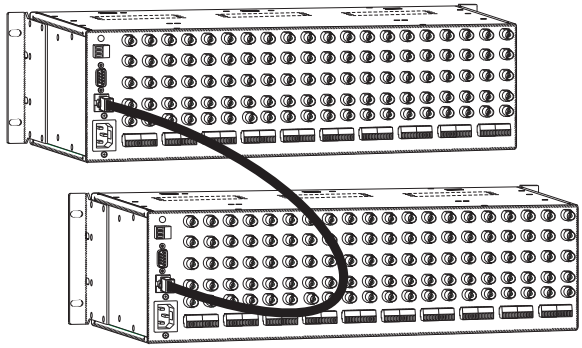
This section applies specifically to Precis models with 32-bit processors and Ethernet link connectors.

In a multi-enclosure system with an external controller, the enclosure connected to the control device receives all control information and relays it via the links to the other enclosures.

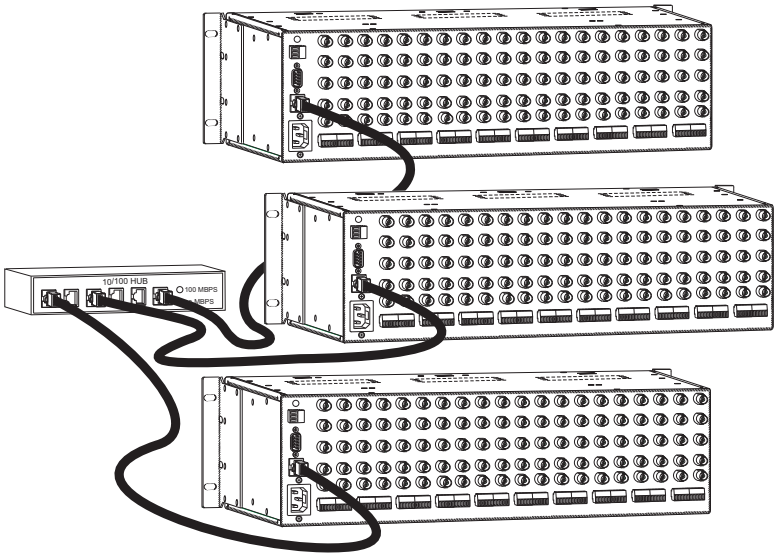
A Precis with an Ethernet connector can have a virtually unlimited number of linked enclosures.

Note: If any linked enclosures were not in the original system, a new configuration file is needed (call technical support; see page 5).

A Link two enclosures using crossover cable (or network cable with a crossover adapter).



B Link three or more enclosures using network cable and a HUB.



INTRODUCTION TO THE PRECIS

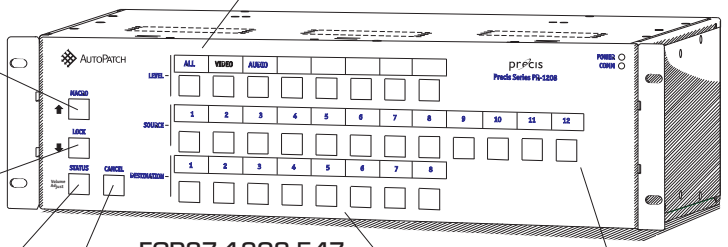
The Precis is available in an 8x4 or 12x8 (some models also come in 8x8) configuration with a variety of control and connector options. A Precis Control Panel works in three standard modes: Switch (default), Status, and Macro.

Use Switch mode to execute switches, Status mode to verify signal status, and Macro mode to execute a macro. If the optional Volume Adjust mode is available, use the Volume Adjust (Status) key, Up Arrow (Macro) key, and Down Arrow (Lock) key to adjust volume.

Level keys
Activates levels for switches or status inquiries, also used for entering macros and the password

Macro key
Places the Control Panel in execute Macro mode

Up Arrow key (optional)
Increases volume



FGP37-1208-547

Lock key
Locks and unlocks Control Panel operations (password required)

Down Arrow key (optional)
Decreases volume

Cancel key
Cancels an incomplete command and returns the Control Panel to Switch mode

Destination keys
Selects a destination on the selected level, also used for entering macros

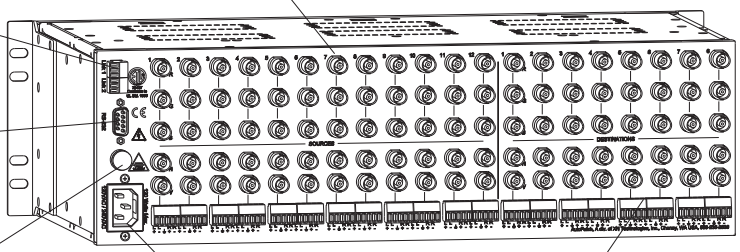
Status key
Places the Control Panel in Status mode

Volume Adjust key (optional)
Places audio in Volume Adjust mode

Source keys
Selects a source on the specified level, also used for entering macros

Source connectors
Connection point for source signal cables

X^{N}Net Link connectors*
Connection point for X^{N}Net controllers and for linking other enclosures



Serial connector
Connection point for RS232 serial devices

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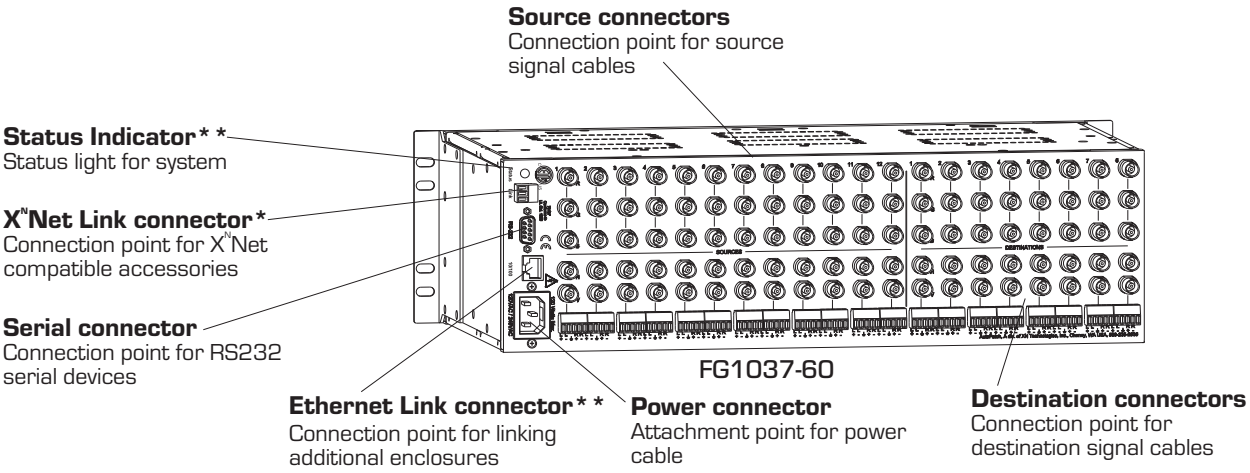
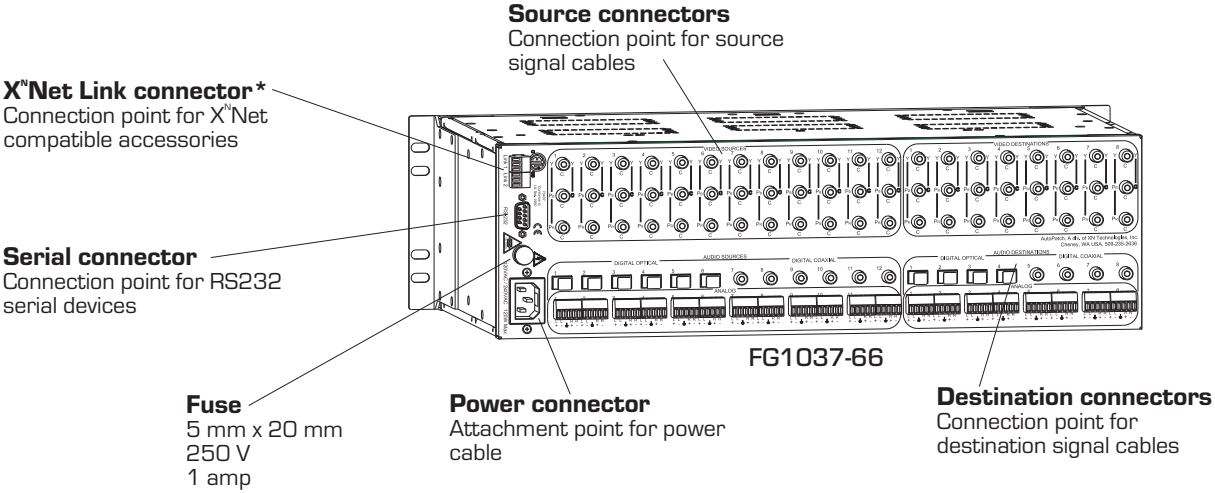
Fuse
5 mm x 20 mm
250 V
1 amp

Power connector
Attachment point for power cable

Destination connectors
Connection point for destination signal cables





*The X^{N}Net Link connector will be single or double depending on the Precis model.

**This feature is not available on all Precis models.

EXECUTING AND DISCONNECTING SWITCHES

A switch is an active connection between a source signal and one or more destination devices. Before executing or disconnecting a switch on the Control Panel, make sure the panel is in Switch mode.

You can execute and disconnect switches from the following:

- The Control Panel
- An external serial controller (computer, AMX, Crestron, etc.) via BCS (Basic Control Structure) commands
- A Single Bus Controller (only executes switches)

Single Bus Controllers are not covered in this document.

EXECUTING AND DISCONNECTING SWITCHES FROM THE CONTROL PANEL

Before executing or disconnecting a switch from the Control Panel, make sure the panel is in Switch mode. If you are unsure which mode the Control Panel is in, press the Cancel key - all the lights on the Control Panel turn off, and the Control Panel reverts to Switch mode. Follow the instructions (to the right) to execute and disconnect switches.

To execute/disconnect a switch:

1. Press a Level key to select a level.

   The Level key illuminates. If you do not select a level, the system executes or disconnects the switch on the level associated with the farthest left Level button (the default level for that key is video and audio).

2. Press a Source key to select a source.

   The Source key flashes, and after a moment any destinations to which that signal is already routed illuminate. The flashing key is the “hot” source; all other commands center around that source until you change mode, level, or select a different source.

3 Press a Destination key(s) to select a destination(s).

   Selecting (illuminating) a disconnected (unlit) Destination key executes a switch; deselecting a connected (lit) Destination key disconnects a switch.

Note: Although our instructions direct you to select a source first, you may execute and disconnect switches by selecting the destination before selecting the source. When you select the destination, the key flashes and is the “hot” destination. All other commands center around that destination until you change mode, level or select another destination. Only one source signal can be routed to a single destination.

EXECUTING AND DISCONNECTING SWITCHES USING BCS COMMANDS

You can use BCS with a device that connects to the serial connector on the Precis CPU. BCS commands are a subset of the X^NNet communications protocol.

EXECUTING SWITCHES

To execute a switch, enter the command using the following command line format (where "#" represents any valid level, source, or destination number).

`CL#I#O#T` or `CL#O#I#T`

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
`CL0I6O2T`	Switches source 6 to destination 2 on Level 0 (default is audio and video)
`CL1I6O2 4T`	Switches source 6 to destinations 2 and 4 on Level 1 (default is video only)
`CL2O2I5T`	Switches source 5 to destination 2 on Level 2 (default is audio only)
`CL2I6X`	Cancels the incomplete command

Note: You can enter multiple destinations in each execute switch command by including a space between each destination number, but you can enter only one source signal and only one level.

DISCONNECTING SWITCHES

To disconnect a switch, enter the command using the following command line format (where "#" represents any valid level, source, or destination number).

To disconnect a source from all destinations, use the second format.

`DL#O#T` or `DL#I#T`

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
`DL1O6T`	Disconnects destination 6 on Level 1 (default is video only)
`DL1I2 4T`	Disconnects sources 2 and 4 from all destinations that are receiving that signal on Level 1 (default is video only)
`DL2I6X`	Cancels the incomplete command

Note: You can enter multiple sources and destinations in each disconnect switch command by including a space between each number, but you can enter only one level.

See "BCS (Basic Control Structure) Commands" on page 25 for a complete list of the BCS command characters.

VERIFYING SIGNAL ROUTING STATUS (SWITCHES)

Verify the routing status of signals to confirm that switches are executing properly.

You can verify signal status from the following:

- The Control Panel
- An external serial controller (computer, AMX, Crestron, etc.) via BCS (Basic Control Structure) commands

VERIFYING SIGNAL STATUS FROM THE CONTROL PANEL

You can put the Control Panel in Status mode by pressing the Status key. The Control Panel remains in Status mode (with the Status key illuminated) until you press the Cancel or Status key. While in Status mode, you can select different Levels, Sources, and Destinations at any time without affecting signal routing.

To verify signal status using the Control Panel:

1. Press the Status key to put the Control Panel in Status mode.

   The Status key illuminates and all other lights on the Control Panel turn off.

2. Press a Level key to select a level.

   The Level key illuminates. If you do not select a level, the system uses the level associated with the farthest left Level key (default is audio and video).

3. Press a Source or Destination key to select a source or destination.

   - If you pressed a Source key, that key illuminates and the Destination keys show the routing status of the signal. If no Destination keys illuminate, the signal is not routed or is not available on that level.
   - If you pressed a Destination key, a Source key illuminates, showing which input source is currently routed to that destination. If no Source key illuminates, the signal is not routed or is not available on that level.

4. Press the Status key or Cancel key to return to Switch mode.

   The Status, Source, and Destination keys turn off, and the Control Panel returns to Switch mode.

VERIFYING SIGNAL STATUS USING BCS COMMANDS

You can use BCS commands with a device that connects to the serial connector on the Precis CPU.

To verify signal routing status, enter the command using the following command line format (where "#" represents any valid level, source, or destination number).

`SL#O#T` or `SL#I#T`

To cancel an incomplete BCS command, enter the "`X`" command at any time.

Examples:

BCS Command	Action
SL0O4T	Returns the status for destination 4 on Level 0 (default is audio and video)
SL2I4T	Returns the status for source 4 on Level 2 (default is audio only)
SL1O7X	Cancels the incomplete command

See “BCS (Basic Control Structure) Commands” on page 25 for a complete list of the BCS command characters.

EXECUTING MACROS

A macro is a predetermined set of switches that always occur together (for example, you may have the most commonly executed switches set as macros). Executing a macro is a shortcut for executing that set of switches. A 12x8 Precis enclosure can store up to 160 macros, and an 8x4 enclosure can store up to 96 macros. To program new macros, see page 16.

You can execute a macro from the following:

- The Control Panel
- An external serial controller (computer, AMX, Crestron, etc.) via BCS (Basic Control Structure) commands

EXECUTING MACROS FROM THE CONTROL PANEL

The Control Panel must be in Macro mode to execute a macro. Once you have selected a macro, the Control Panel returns to Switch mode. Put the Control Panel in Macro mode again to execute another macro.

To execute a macro using the Control Panel:

1. Press the Macro key to put the Control Panel in Macro mode.

   The Macro key flashes, and all other lights on the Control Panel turn off. When the Macro key starts flashing, you have 10 seconds to enter the macro before the Control Panel reverts to Switch mode.

2. Press a Level key to select the level where the macro resides.

   The Level key illuminates.

3. Press a Source or Destination key to select a macro. Each key is assigned a different macro.

   The Macro key stops flashing, the macro is executed, and the Control Panel returns to Switch mode. All Control Panel lights are off.

4. Repeat steps 1 through 3 for each macro you want to execute.

EXECUTING MACROS USING BCS COMMANDS

You can use BCS commands with a device that connects to the serial connector on the Precis CPU. BCS commands are a subset of the X^NNet communications protocol.

To execute a macro, enter the command using the following command line format (where "#" represents any valid macro number).

`RL#P#T` or `RL#P# #T`

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
`RL1P2T`	Executes macro 2 on Level 1 (default is video only)
`RL2P1 2T`	Executes macros 1 and 2 on Level 2 (default is audio only)
`RL8PX`	Cancels the incomplete command

Note: In each execute macro command, you can enter multiple macros by including a space between each macro number.

See "BCS (Basic Control Structure) Commands" on page 25 for a complete list of the BCS command characters.

MANAGING CONFIGURATION FILES

XNCONNECT

X^NConnect is a graphical software program (with a Help file) that can display your most recent configuration and allows you to:

- Set the password
- Add macros for local presets
- Redefine levels

X^NConnect can also download the modified file to the system.

Note: Use this software *only* if you need to change the configuration from the original specification.

To install X^NConnect:

1. Close all other applications currently running on your PC.
2. Insert the *AMX AutoPatch CD* into your CD drive to automatically start.
   If the CD does not autorun, explore the CD folders and double-click the menu.pdf.
3. Follow the directions in subsequent dialogs in the installation program.
4. Review the Readme.txt file found on CD:\APConfig\ or after installation in the main installation folder. The default location is C:\AutoPtch\Configuration Software <Version>.

* If you cannot locate your system's *AMX AutoPatch CD*, have your serial number ready and contact technical support.

To launch X^{N}Connect, open the configuration file and connect the enclosure for downloading configuration information:

1. From the Start menu, select Programs.
2. Select AutoPatch Applications (or any other file group you selected during the install).
3. Select the XNConnect group.
4. Select the XNConnect program.
5. Open your configuration file found in the C:\AutoPtch\Configuration Software <Version>\MyXCL folder.
6. Make a duplicate copy of your .xcl file with a new unique name using Save As. [We strongly recommend this optional step.]
7. Connect the enclosure to your PC via the communication ports.**

**If your PC does not use Com 1, after step 4 open the Communication menu, select the appropriate communication link, select Change Comm Settings, and make necessary changes.

SETTING THE PASSWORD

For information on using the password to lock and unlock the control panel, see page 23.

To set a front panel password:

1. Follow the steps for launching X^{N}Connect.
2. In the Hardware View, right click the appropriate front panel icon. (Double-click the Precis first if the front panel icon is not displayed.)
3. Select Set Password.
4. Enter a single digit between zero and seven in each field.
5. Check the box for Configure password immediately. Click OK.

ADDING MACROS FOR LOCAL PRESETS

If your Precis firmware (embedded software) version is earlier than Version 1.4.1, contact AMX for conditions that apply to programming macros for presets.

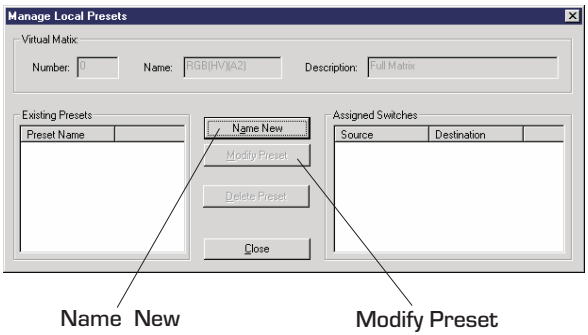
To discern your firmware version:

1. Follow the steps for launching X^{N}Connect (see page 16).
2. From the File menu, select Discover Hardware only.
3. Select the enclosure on the tree in the left pane.
4. Click the Network tab in the right pane to display the CPU Firmware version number.

The following steps use as an example the construction of macro #1 (ConfRm1) that connects level 0, input 1 to output 4 and input 2 to outputs 2 and 3.

To add macro (preset) information to the configuration file:

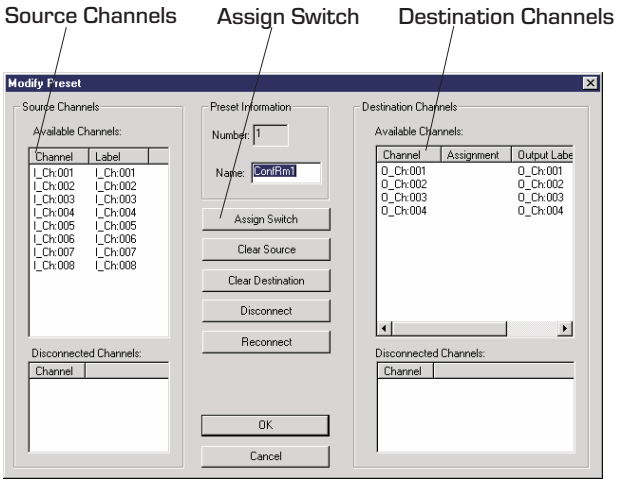
1. Follow the steps for launching X^{N}Connect (see page 16).
2. In the Virtual Matrices view, right click the level 0 (first) virtual matrix and select Manage Local Presets (see the next graphic).
3. Click the Name New button; enter the name ConfRm1. (Description is optional.) Click OK.



4. Click the Modify Preset button. The Modify Preset dialog appears (see the next graphic).

5. Select Source Channel 1 and Destination Channel 4; click the Assign Switch button.

6. Select Source Channel 2 and Destination Channels 2 and 3 (hold the Ctrl key when multi-selecting); click Assign Switch.



7. Click OK.

8. From the Configure menu, select Configure All VM Local Presets.

The system is now ready to execute the macro (preset) using either the Control Panel or BCS commands.

REDEFINING LEVELS

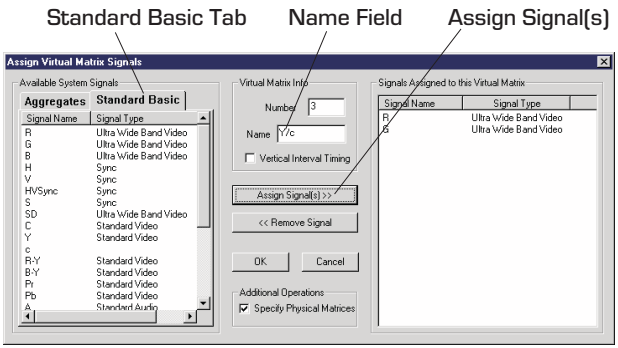
X^NConnect can be used to redefine levels (virtual matrices). The following steps provide the example of configuring the RGB connectors on a 12x8 Precis to switch Y/c and composite signals by modifying existing (default) virtual matrices (levels).

To reconfigure RGB connectors to switch Y/c and composite:

1. Follow the steps for launching X^NConnect (see page 16).

2. In the Virtual Matrix view, right click the Red virtual matrix and select delete. Repeat with the Green virtual matrix.

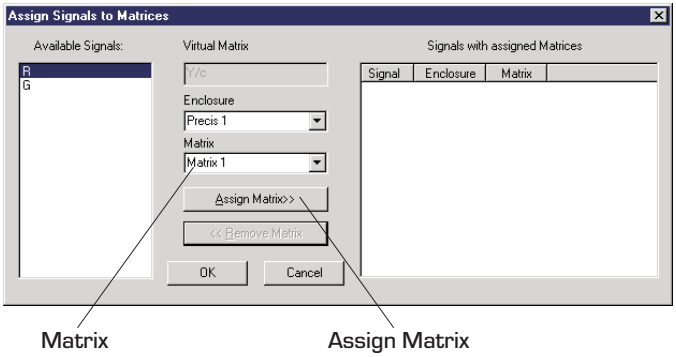
3. From the Add menu, select Virtual Matrix. The Assign Virtual Matrix Signals dialog appears.



4. Type Y/c in the Name field.

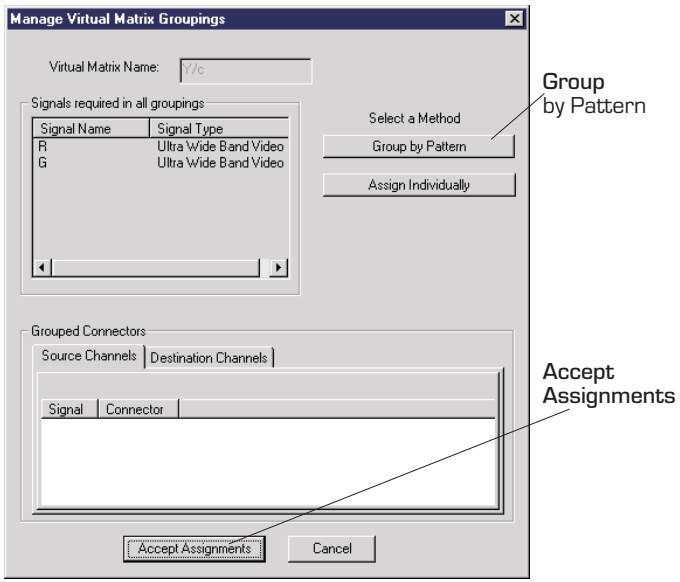
5. Click the Standard Basic tab. From its list, select R and click the Assign Signal(s)

button; repeat with G and click OK. The Assign Signals to Matrices dialog appears.

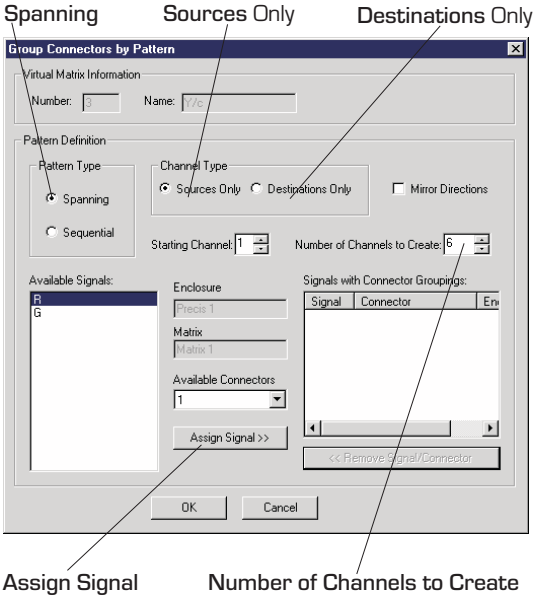


6. Select Matrix 1 under Matrix for R and click the Assign Matrix button. Select Matrix 2 for G and click Assign Matrix. Click OK.

7. In the left pane, right click the newly created Y/c virtual matrix and select Manage Connector Groupings. The Manage Virtual Matrix Groupings dialog appears.



8. Click the Group by Pattern button. The Group Connectors by Pattern dialog



appears.

9. Click the Spanning and Sources Only radio buttons in the Pattern Definition group.

10. Select 6 in the Number of Channels to Create field and click the Assign Signal button twice, accepting the default connector numbers. This assigns 6 channels to R for the Y signal and 6 to G for the c channel. Click OK.

11. Repeat steps 8 through 10, clicking Destinations Only instead of Sources Only and selecting 4 channels instead of 6. Click OK.

12. Click the Accept Assignments button.

13. Repeat steps 2 through 12 with the following modifications to create a "composite signal" virtual matrix.
    Step 2: Delete the Blue Only virtual matrix.
    Step 4: Type Composite in the Name field.
    Step 5: Select B.
    Step 6: Select Matrix 3.
    Step 10: Select 12 channels.
    Step 11: Select 8 channels.

14. From the Configure menu, select the Configure All command.

The system is now ready to switch Y/c signals on level 3 and composite signals on level 4 using either the Control Panel (fourth and fifth level buttons respectively) or BCS commands.

Note: For more information on redefining levels, see the X^NConnect Help file.

ADJUSTING AND CHECKING VOLUME (OPTIONAL FEATURE)

If your system has the Volume Control option, you can adjust volume from the following:

- Control Panel
- An external controller (computer, AMX, Crestron, etc.) via BCS (Basic Control Structure) commands

You can check volume status only from an external controller via BCS commands.

ADJUSTING VOLUME FROM THE CONTROL PANEL

Before adjusting the volume, check to be sure the panel is in Switch mode. If you are unsure which mode the Control Panel is in, press the Cancel key – all the lights on the Control Panel turn off, and the Control Panel reverts to Switch mode.

Follow the instructions to adjust the volume using the increment/decrement method (volume is increased or decreased by
1 dB below –30 dBu and 0.5 dB above).

To adjust volume using the Increment/Decrement method:

1. Press and hold the Volume Adjust (Status) key for at least 2 seconds, until it illuminates and then flashes to indicate that the control panel is in Volume Adjust mode.

2. Press a Destination key(s) to select the output(s) that needs volume adjustment.

   The Destination key(s) illuminates, along with the Up Arrow (Macro) and Down Arrow (Lock) keys.

3. Press and release the Up Arrow (Macro) key to increase the volume or the Down Arrow (Lock) key to decrease the volume.

   The pressed key flashes and then stays illuminated.

4. Repeat step three until the desired volume level is reached.

5. Press the Cancel key to return to the Switch (default) mode.

Note: Pressing the Cancel key does not cancel any of the volume adjustments that were just entered.

ADJUSTING VOLUME USING BCS COMMANDS

You can use BCS with an external controller that connects to the serial connector on the Precis CPU. BCS commands are a subset of the X^NNet communications protocol. Adjusting volume can be done using any of the following four methods.

- Absolute – adjusts the volume to a specific decibel level
- Relative – increases the volume a specific decibel amount
- Increment/Decrement – increases or decreases the volume a step
- Mute/Un-mute (Optional Feature) – applies or removes mute to volume

Note: Volume adjustments are made on an audio level and will remain in effect if you then switch the output(s) on an audio follow video level.

ADJUSTING VOLUME – ABSOLUTE METHOD

You can use the Absolute method to adjust the volume of a destination signal to a specific decibel level that is defined in relationship to the input level.

To adjust volume using the Absolute method, enter the command using the following command line format (where "#" represents any valid audio level or destination number and "^^^" represents the specific decibel level you want). The decibel level is specified as a decimal number to the tenth place without the decimal marker; for example, enter 100 for a decibel level of +10.0 or enter –35 for a decibel level of –3.5. The decimal number must be between –70.0 and 10.0.

```
CL#O#VA^^^T
```

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
CL0O3VA100T	Adjusts volume to 10.0 dB for Level 0, destination 3
CL0O6 7VA50T	Adjusts volume to 5.0 dB for Level 0, destinations 6 and 7
CL0O2VA-250T	Adjusts volume to –25.0 dB for Level 0, destination 2
CL0O7VA2X	Cancels the incomplete command

Note: You can enter multiple destinations in each Absolute Volume command by including a space between each destination number, but you can enter only one level per command line.

ADJUSTING VOLUME – RELATIVE METHOD

You can use the Relative method to adjust the volume of a destination signal by a specific amount.

To adjust volume using the Relative method, enter the command using the following command line format (where "#" represents any valid audio level or destination number and "^^^" represents the specific increase or decrease in decibel level that you want). The amount is specified as a decimal number to the tenth place without the decimal marker; for example, enter the digits 25 for an increase in the decibel level of +2.5 or enter –250 for a decrease in the decibel level of –25.0 The decimal number must be between –70.0 and 10.0.

```
CL#O#VR^^^T
```

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
CL0O3VR60T	Increases volume by 6.0 dB for Level 0, destination 3
CL0O1 2VR-60T	Decreases volume by –6.0 dB for Level 0, destinations 1 and 2
CL0O5VR-120T	Decreases volume by –12.0 dB for Level 0, destination 5
CL0O7VX	Cancels the incomplete command

Note: You can enter multiple destinations in each Relative Volume command by including a space between each destination number, but you can enter only one level per command line.

ADJUSTING VOLUME – INCREMENT/DECREMENT METHOD

You can use the Increment/Decrement method to increase or decrease the volume of a destination signal a step (volume is increased or decreased by 1 dB below –30 dBu and 0.5 dB above). You may need to repeat the command to hear an audible difference.

To adjust volume using the Increment/Decrement method, enter the command using the following command line format (where "#" represents any valid audio level or destination number and "S+" and "S–" represent a step of increase or decrease, respectively, in volume).

CL#O#VS+T or CL#O#VS-T

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action
CL0O3VS+T	Increases volume a step for Level 0, destination 3
CL0O5 6VS+T	Increases volume a step for Level 0, destinations 5 and 6
CL0O2VS-T	Decreases volume a step for Level 0, destination 2
CL0O4 8VS-T	Decreases volume a step for destinations 4 and 8
CL0O7VSX	Cancels the incomplete command

Note: You can enter multiple destinations in each Increment/Decrement Volume command by including a space between each destination number, but you can enter only one level per command line.

APPLYING/REMOVING MUTE (OPTIONAL FEATURE)

If your system has the Mute option, you can apply and remove the mute to the volume using BCS commands. Removing the mute returns a destination to its previous un-muted volume level.

To mute the volume, enter the command using the following command line format (where "#" represents any valid audio level or destination number).

CL#O#VMT

Examples:

BCS Command	Action
CL0O2VMT	Mutes volume for Level 0, destination 2
CL0O1 4VMT	Mutes volume for Level 0, Destinations 1 and 4

To remove the mute, enter the command using the following command line format (where "#" represents any valid audio level or destination number).

CL#O#VUT

Tip: This command is easy to remember if you think of the "VU" as "volume un-mute."

Examples:

BCS Command	Action
CL0O3VUT	Removes mute for Level 0, destination 3
CL0O6 7VUT	Removes mute for Level 0, destinations 6 and 7

Note: When a Mute command is followed by any other volume command, other than un-mute, the volume returns to its previous un-muted state before the new command is applied. For example, if destination 1 was set at 5 dB and a mute command was entered (CL0O1VMT), and then later an Increment command (CL0O1VS+T) was entered, the result would be a volume level of 5.5 dB.

CHECKING VOLUME STATUS

You can check volume status only from an external controller via BCS commands.

To check the volume status for a specific destination, enter the command using the following command line format (where "#" represents any valid audio level or destination number). The decibel level in the result of the status check is specified as a decimal number to the tenth place without the decimal marker; for example if the result is –480, the decibel level is –48.0 or if the result is 48, the decibel level is +4.8.

SL#O#VAT

To cancel an incomplete BCS command, enter the "X" command at any time.

Examples:

BCS Command	Action	Result
SL0O3VAT	Checks volume status for Level 0, destination 3	SL0O3VAT(35) [+3.5 dB]
SL0O8VAT	Checks volume status for Level 0, destination 8	SL0O8VAT(5) [+0.5 dB]
SL0O2VAT	Checks volume status for Level 0, destination 2	SL0O2VAT(-125) [-12.5 dB]

Note: You cannot enter multiple levels or destinations in Volume Status commands.

ADJUSTING AND CHECKING INPUT GAIN (OPTIONAL FEATURE)

If your system has the Volume Control option, it also supports the Input Gain Control option.

Caution: We recommend that input gain adjustments be made *only* by a qualified dealer.

The purpose of Precis "Input Gain Control" is to allow source (input) signals of various amplitudes to be equalized before they are routed and the volume is adjusted. Equalizing source levels provides a consistent reference for volume adjustments and eliminates level jumps when routing a new source to a destination.

Typical uses for input gain (the nominal level of the signal from the source device) include switching consumer and professional grade audio equipment (whose levels can vary noticeably) in the same matrix switcher and for equalizing amplitudes between balanced and unbalanced source inputs.

To use the "Input Gain Control" feature to equalize input levels:

1. Route a source (input) to the first destination (output).
2. Adjust the input gain for the source to a specific dB level.
3. Repeat for all sources that will be routed to the same destination.

You can adjust input gain and check its status by modifying the instructions in the previous section, "Adjusting and Checking Volume," as follows:

- Control Panel – select a Source (input) key instead of a Destination (output) key.
- BCS Commands – substitute an "`I`" (input) for the "`O`" (output) in the command line.

The range of input gain adjustment is from +10 to –10 decibels.

LOCKING AND UNLOCKING THE CONTROL PANEL

Disable Control Panel operations to prevent accidental switches and macros by locking the Control Panel. When the Control Panel is locked, the Lock key is illuminated, and you are unable to use the Control Panel for any operations other than unlocking the panel. While the Control Panel is locked, BCS commands still work.

Use the password that came with your system (the default password from the factory is the first five Level keys, going left to right) to lock and unlock the Control Panel; you cannot lock or unlock the panel using BCS commands. To change your password, see page 16.

After you press the Lock key, you have 10 seconds to enter the password before the Control 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.

To lock/unlock the Control Panel:

1. Press the Lock key to put the Control Panel in Lock mode.
   The Lock key flashes (for only 10 seconds), and all other lights on the Control Panel turn off. You must enter the password while the Lock key is flashing.

2. While the Lock key is flashing, enter the enclosure's password (the default password from the factory is the first five Level keys, going left to right).

   › If you locked the Control Panel, the Lock key light stops flashing and shines constant; all other lights on the Control Panel turn off.

   › If you unlocked the Control Panel, the Lock key light turns off and the panel is in Switch mode.

BCS (BASIC CONTROL STRUCTURE) COMMANDS

BCS is a set of alphanumeric characters that allow a PC or other control device to send commands to your Precis through the serial connector (on the CPU). To establish communication between your PC (personal computer) and your Precis, attach the PC to the serial connector and use terminal emulation software (such as Windows95 HyperTerminal). BCS commands are a subset of the X^NNet communications protocol.

Command Line Formats

To generate commands, enter them using the following formats in which "#" represents any valid level, local preset, input, or output number and "^^^" represents a decimal number to the tenth place without the decimal marker (for example, 100 = 10.0 and 35 = 3.5).

For multiple outputs or multiple local presets, enter a space between each number.

`O` is the letter O, not the number zero (0).

- ❑ To execute a switch:
  `CL#I#O#T` or `CL#O#I#T`
- ❑ To verify switch status:
  `SL#O#T` or `SL#I#T`
- ❑ To execute a local preset:
  `RL#P#T`
- ❑ To disconnect a switch:
  `DL#O#T` or `DL#I#T`
- ❑ To adjust absolute volume*:
  `CL#O#VA^^^T`
- ❑ To adjust relative volume*:
  `CL#O#VR^^^T`
- ❑ To adjust increment/decrement volume*:
  `CL#O#VS+T` or `CL#O#VS-T`
- ❑ To apply volume mute*:
  `CL#O#VMT`
- ❑ To apply volume un-mute*:
  `CL#O#VUT`

*To use these commands your system must contain audio boards with Volume Adjustment capability. In addition, the mute and un-mute commands require a Precis with a 32-bit CPU. If the command specifies a decimal number, the number must fall within the adjustment range for the specific type of audio board.

The table below shows BCS command characters (keys), their functions, and short descriptions of their functions.

Key	Function	Description
C	Change	Initiates an execute switch command; this must precede the source and destination specifications
D	Disconnect	Initiates a disconnect switch command; this must precede the source and destination specifications
L	Level	Flags the next 1- to 2- digit number as a level number Default settings are: Level 0 - Audio and Video Level 1 - Video only Level 2 - Audio only
"0" - "9"	Number	Identifies inputs, outputs, macros, and levels; combine the digits to form larger numbers
I	Input	Flags the next single digit number as an input specification
O	Output	Flags the next 1- to 2- digit number as an output specification **Note:** O is the letter O, not the number zero (0)
" "	Space	Separates numbers in multiple number entries
T	Take	Executes a command
X	Exit	Exits, or cancels, the command being entered
S	Status	Initiates verification of the status of input and output connections
R	Macro	Initiates an execute global macro or execute local macro command **Note:** Global macros are not implemented at this time
P	Macro Number	Flags the next 1- to 2- digit number as a local macro number
VA	Volume Absolute	Flags the next 1 - 3 digit number as the volume adjustment to a specific decibel level
VR	Volume Relative	Flags the next 1 - 3 digit number as the volume adjustment of a specific decibel amount
VS+ or VS-	Volume Step Increment/Decrement	Adjusts volume of a specified output up or down a step
VM or VU	Volume Mute/Un-mute	Applies or removes mute to the volume

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Precis Specifications

General Specifications

General Specifications	
Parameter	**Value**
Approvals	CE, ETL, cETL
AC Power	100 to 240 VAC single phase, 50 to 60 Hz
Power Consumption (max.)	75 Watts per enclosure
Power Consumption (typical)	40 Watts per enclosure
Operational Temperature	32° to 110° F (0° to 43° C)
Humidity	0 to 90% non-condensing
Dimensions	10.4 in. (26.4 cm) depth 18.8 in. (47.7 cm) width with rack ears 17.4 in. (44.2 cm) width without rack ears 5.2 in. (13.2 cm) height 3 RU
Weight	Approximately 12 lb. (5.4 kg) per enclosure

Precis Wideband (300 MHz) Specifications

Applies to Precis Series pre-configured systems tuned for wideband signals.

Precis Wideband (300 MHz) Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 300 MHz or better
Crosstalk (adjacent channel)	f = 5 MHz	<-60 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Return Loss	f = 5 MHz	<-45 dB
Input Level (max.)		±1.5 V
Input Impedance		75 ohms
Output Level (max.)		±1.5 V
Output Impedance		75 ohms
Connector Type		BNC

Chapter updated 02/18/08

Precis Ultra-Wideband (500 MHz) Specifications

Applies to Precis Series pre-configured systems that switch ultra-wideband signals, including all Slam Dunk models.

Precis Ultra-Wideband (500 MHz) Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 500 MHz or better
Crosstalk (adjacent channel)	f = 5 MHz	<-60 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Return Loss	f = 5 MHz	<-45 dB
Input Level (max.)		±1.25 V
Input Impedance		75 ohms
Output Level (max.)		±1.25 V
Output Impedance		75 ohms
Connector Type		BNC

Precis Sync Specifications

Applies to Precis pre-configured systems that switch sync signals with either ultra-wideband or wideband signals.

Precis Sync Specifications		
Parameter	**Conditions**	**Value**
Input Level (max.)		±5 V
Input Impedance (Hi-Z)		22 kohms
Output Level (max.)		±5 V
Output Impedance		75 ohms
Connector Type		BNC

Precis HT Component Specifications

Applies to Precis HT systems: FGP37-0804-A4B, FGP37-0804-34B, FGP37-1208-A4B, and FGP37-1208-34B.

Precis Component Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	1 to All	±3 dB to 300 MHz or better
Crosstalk (adjacent channel)	f = 5 MHz	<-60 dB
Signal to Noise Ratio (SNR)	Vin = 0.7 V, 100 IRE	>65 dB
Return Loss	f = 5 MHz	<-45 dB
Input Level (max.)		±1.5 V
Input Impedance		75 ohms
Output Level (max.)		±1.5 V
Output Impedance		75 ohms
Connector Type		RCA or BNC

Precis HT S/PDIF Specifications

Applies to Precis HT systems: FGP37-0804-A4B, FGP37-0804-34B, FGP37-1208-A4B, and FGP37-1208-34B.

Precis S/PDIF Specifications		
Parameter	**Conditions**	**Value**
Standard		IEC60958
Resolution		16 bit to 24 bit
Sample Rate		36 to 96 kHz
Input Signal Amplitude		0.2 Vpp to 2.5 Vpp terminated
Output Signal Amplitude		0.4 Vpp to 1.0 Vpp terminated into 75 ohms
Rise & Fall Time		<20 nS
Jitter		<5 nS
Connector Type		S/PDIF (coaxial)

Precis HT TosLink Specifications

Applies to Precis HT systems: FGP37-0804-A4B, FGP37-0804-34B, FGP37-1208-A4B, and FGP37-1208-34B.

Precis TosLink Specifications		
Parameter	**Conditions**	**Value**
Resolution		16 bit to 24 bit
Sample Rate		36 to 96 kHz
Rise & Fall Time		<20 nS
Jitter		<5 nS
Connector Type		TosLink (optical)

Precis Audio Specifications

Applies to all Precis pre-configured systems.

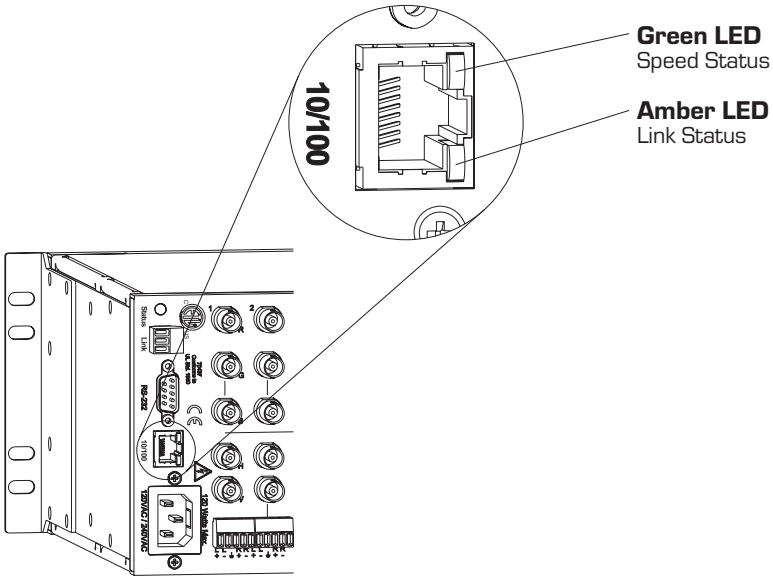
Standard Audio Specifications		
Parameter	**Conditions**	**Value**
Frequency Response	20 Hz to 20 kHz	<±0.1 dB
THD + Noise	f = 20 Hz to 20 kHz Vin = -6 dBu to +26 dBu, no volume control f = 20 Hz to 20 kHz Vin = -10 dBu to +20 dBu, with volume control	<0.02% <0.1%
Crosstalk	f = 1 kHz, Vin = +14 dBu, no volume control f = 1 kHz, Vin = +14 dBu, with volume control	<-110 dB <-90 dB
Signal to Noise Ratio (SNR)	f = 20 Hz to 20 kHz Vin = +20 dBu, no volume control f = 20 Hz to 20 kHz Vin = +10 dBu, with volume control	>100 dB >80 dB
Input Level (max.)		+27 dBu, balanced
Input Impedance		18 kohms
Input Gain Adjustment Range	Control panel or serial control adjustment	+10 dB to -10 dB
Output Level (max.)		+27 dBu, balanced
Output Impedance		50 ohms
Output Volume Control Adjustment Range	Control panel or serial control adjustment	+10 dB to -70 dB
Connector Type		5-position terminal block

ETHERNET CONNECTOR LEDS

This section applies specifically to Precis models with 32-bit processors and Ethernet link connectors. The Ethernet 10/100 Base-T connector has two LEDs, one green and one amber.

The LEDs indicate the following:

- Green LED *on* – speed status is 100 MBPS
- Green LED *off* – speed status is 10 MBPS
- Amber LED *on* – link status is active



Ethernet LEDs (shown on Model FG1037-60)

Note: The Comm light on the front panel indicates there is Ethernet traffic on the system.