

ClearOne®

CONVERGE™ PRO 880/840T/TH20/8i Professional Conferencing Systems

INSTALLATION & OPERATION MANUAL



TECHNICAL SUPPORT

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CONVERGE PRO 880/840T/TH20/8i INSTALLATION & OPERATION MANUAL

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CHAPTER 1: INTRODUCTION

CONVERGE PRO PRODUCT FAMILY OVERVIEW

Congratulations on purchasing a ClearOne® Converge™ Pro audio conferencing solution. The Converge™ Pro product family represents a revolutionary advance in state-of-the-art audio technology for large-scale conferencing applications.

ClearOne® Communications introduced its first audio conferencing products to the market in 1990 under the brand name Gentner®. Since that time, four generations of products have been produced, each offering improved performance and reliability. Our commitment remains to provide the highest quality audio for all conferencing environments.

With over 80,000 installations in customer sites ranging from Fortune 1000 companies to the federal government, ClearOne products are used in the most demanding applications, where they consistently deliver industry-leading audio quality and unsurpassed reliability. ClearOne's fourth-generation Acoustic Echo Cancellation (AEC), which forms the foundation of the Converge™ Pro product family, is optimized for today's distributed conferencing environments. AEC, combined with noise cancellation, automatic gain and level control, advanced microphone gating, and numerous other ClearOne innovations, deliver crystal-clear audio that is equivalent to conferencing participants being in the same room.



Applications

The Converge Pro product family delivers best-in-class, scalable conferencing solutions for any size venue. Some common applications include:

- Boardrooms
- Training rooms
- Courtrooms
- Multimedia rooms
- Distance learning
- Auditoriums
- Houses of worship
- Sound reinforcement
- Large meeting venues

Models

The Converge™ Pro product family includes the following models:

- Converge™ Pro 880
- Converge™ Pro 840T
- Converge™ Pro TH20
- Converge™ Pro 8i

Common Benefits

All products in the Converge™ Pro product family offer the following benefits:

- Superior audio quality
- ClearOne®'s next generation signal processing algorithms
- Field-proven conferencing technology
- Flexible configuration and expandability
- Improved software interface
- Simplified programming
- Reduced installation times
- Best-in-class processing speed
- ClearOne®'s world-class customer service, technical support, and field engineering

Common Features

The leading-edge features common to all products in the Converge™ Pro family include:

- USB type B connector on front panel
- Dual RJ-45 Ethernet ports
- Dual RJ-45 E-bus (expansion bus) ports
- TDM (Time Division Multiplexed) mix/minus audio and control buses
- RS-232 serial port (up to 115,200 bps)
- Dual DB-25 control/status GPIO Ports
- Mini-Phoenix audio input/output connectors (color-coded by channel type)
- Differential inputs and outputs

Feature Enhancements

Converge™ Pro feature enhancements include:

- Next generation ClearOne® Distributed Echo Cancellation®—four or eight input digital signal processors (DSPs) improve full-duplex performance and remove echo in the most difficult acoustic environments.
- New PTT (Push-to-Talk) microphone compatibility provides greater design and configuration flexibility.
- Advanced noise cancellation reduces background noise caused by fans, HVAC systems, and other relatively constant background noise sources.
- Four or eight independent signal processing blocks with 15 user-configurable filters (including all pass, low pass, high pass, low shelving, high shelving, and parametric), delay, and compression. ClearOne®'s unparalleled processing power enables you to use all of these features simultaneously in any combination, allowing you to deliver optimized audio configurations for every environment and application.
- Enhanced expansion bus capabilities—connect up to 28 Converge Pro units together and use up to 64 microphones and 16 phone lines for a single site.
- Increased distance between units—up to 200 feet/60.96 meters.
- Graphical, user-configurable routing matrix allows you to route any input channel to any output, processing,

- or fader channel (or combination thereof) on any Converge™ Pro unit, or across the expansion bus.
- Front panel control of mute and gain for all input and output channels.
- Safety mute button on the Console™ software button bar instantly mutes all outputs.
- ClearOne®'s DSP (Digital Signal Processing) technology ensures crystal-clear audio between teleconferencing sites.

AEC (Acoustical Echo Cancellation) Enhancements

- Smoothing filters to reduce artifacts
- Pre-AEC bypass channels
- Improved AEC adaption and noise suppression algorithms
- Automated Push-to-Talk microphone mode with AEC freezing
- Gain and gating control tracking
- Cross point gain adjustments
- Four fader channels
- Microphone preamp gain control
- 7 dB coarse gain and .5 dB fine gain increments for improved microphone gain matching
- AGC (Automatic Gain Control) algorithm
- ALC (Automatic Level Control) algorithm

Telephone Hybrid Enhancements (840T and TH20)

- Custom telephone line settings for international teleconferencing and in-country localization
- Type I & Type II auto-sensing telephone interface (U.S./E.U.)
- International impedence matching
- Improved TEC (Telco Echo Cancellation) with 31 millisecond tail time
- Continual TEC adaptation to telephone line conditions
- ClearEffect™ wideband audio emulation algorithm
- Digital anti-alias filter minimizes CO switching noise and hum
- ALC (Automatic Level Control) on telco receive channel
- Improved call management and processing
- Adjustable dial tone, DTMF attenuation
- Off-hook DTMF generation
- Robust dial tone detection
- Ringer selection
- Caller ID
- Touch-tone dialing capability (44 character dial string)
- Analog telephone line compatibility
- 10 W speaker amplifier (840T only)

CONVERGE PRO PRODUCT DESCRIPTIONS

Converge Pro 880



The successor to the industry-leading XAP® 800. As the flagship product in ClearOne's next-generation Converge Pro professional audio conferencing product line, the 880 delivers rich functionality with improved audio performance, enhanced management, and simplified configuration for audio conferencing and sound reinforcement applications.

Converge Pro 880 advantages include:

Advanced Conferencing Feature Set

- Next-generation Acoustic Echo Cancellation
 - » Improved duplex performance
 - » Push-to-talk microphone compatibility
- Next-generation Noise Cancellation
 - » Adaptive modeling to room ambient noise conditions
- Increased resolution on Microphone Preamp stage
 - » 0-56 dB in 7 dB increments
- Pre-AEC routing for sound reinforcement applications
 - » Maximum of 4 millisecond processing delay
- Management Improvements
 - » Integrated Ethernet and USB connections
 - » SNMP and HTML remote management agents with SMTP email alerts
 - » Web-based, customizable user and control consoles
 - » Event scheduler
 - » Diagnostic console
- Simplified Configuration Software
 - » Drag & drop A/V and channel objects
 - » Selectable Console views—Unit, Matrix, and Channel
- Expanded serial command set

Superior Audio Performance

- Next-generation Distributed Echo Cancellation® on every mic input
- First-mic priority delivers clear audio to the far end
- 20 Hz-22 kHz bandwidth for full-range audio response
- ALC & AGC keep participants' audio balanced and consistent

Configuration Flexibility

- Scalable – link multiple Converge Pro units (880, 840T, 8i, TH20) for extensive microphone coverage and up to 16 phone lines
- Enhanced expansion bus, featuring 12 mix-minus audio buses for routing between units
- Eight mic gating groups (four internal & four global) allow separation of mics into individual mixer gating groups for greater configuration flexibility
- 32 presets can be executed on-the-fly without disturbing other ongoing preset operations
- 255 Macros for customized audio control/configuration with single command execution

Conferencing Capability

- Link with multiple Converge Pro units for a total of up to 16 telephone lines and 64 mic inputs

Converge Pro 840T



The successor to the industry-leading XAP® 400. Leveraging the rich functionality of the flagship Converge™ Pro 880, the new 840T includes a built-in telephone interface and power amplifier for standalone conferencing applications. It also provides expansion capability with other Converge™ Pro mixers for complex installations.

Converge Pro 840T advantages include:

Advanced Telephone Conferencing Feature Set

- Signal Processing Improvements
 - » Telephone noise cancellation on RX channel
 - » ClearEffect speech enhancement
 - » Automatic level control on RX channel
 - » Caller ID
 - » Selectable ringers

Advanced Conferencing Feature Set

- Next-generation Acoustic Echo Cancellation
 - » Improved duplex performance
 - » Push-to-talk microphone compatibility
- Next-generation Noise Cancellation
 - » Adaptive modeling to room ambient noise conditions
- Increased resolution on Microphone Preamp stage
 - » 0-56 dB in 7 dB increments
- Pre-AEC routing for sound reinforcement applications
 - » Maximum of 4 millisecond processing delay
- Management Improvements
 - » Integrated Ethernet and USB connections
 - » SNMP and HTML remote management agents with SMTP email alerts
 - » Web-based, customizable user and control consoles
 - » Event scheduler
 - » Diagnostic console
- Simplified Configuration Software
 - » Drag & drop A/V and channel objects
 - » Selectable Console views—Unit, Matrix, and Channel
- Expanded serial command set

Superior Audio Performance

- Next-generation Distributed Echo Cancellation® on every mic input
- First-mic priority delivers clear audio to the far end
- 20 Hz-22 kHz bandwidth for full-range audio response
- ALC & AGC keep participants' audio balanced and consistent

(Continued on next page)

Converge Pro 840T (Continued)

Configuration Flexibility

- Scalable – link multiple Converge Pro units (880, 840T, 8i, TH20) for extensive microphone coverage and up to 16 phone lines
- Enhanced expansion bus, featuring 12 mix-minus audio buses for routing between units
- Eight mic gating groups (four internal & four global) allow separation of mics into individual mixer gating groups for greater configuration flexibility
- 32 presets can be executed on-the-fly without disturbing other ongoing preset operations
- 255 Macros for customized audio control/configuration with single command execution

Conferencing Capability

- Link with multiple Converge Pro units for a total of up to 16 telephone lines and 64 mic inputs

Converge Pro 8i



An input-only expansion box for the Converge Pro platform. The 8i delivers new economical configuration flexibility. It can be added to 880, 840T, and TH20 systems for additional mic and line inputs, allowing customers to match the number of inputs and outputs required for audio conferencing and sound reinforcement installations.

Converge Pro 8i advantages:

Advanced Conferencing Feature Set

- Economical Mic/Line only mixer for large configurations where additional output channels are not required
- Next-generation Acoustic Echo Cancellation
 - » Improved duplex performance
 - » Push-to-talk microphone compatibility
- Next-generation Noise Cancellation
 - » Adaptive modeling to room ambient noise conditions
- Increased resolution on Microphone Preamp stage
 - » 0-56 dB in 7 dB increments
- Pre-AEC routing for sound reinforcement applications
 - » Maximum of 4 millisecond processing delay
- Management Improvements
 - » Integrated Ethernet and USB connections
 - » SNMP and HTML remote management agents with SMTP email alerts
 - » Web-based, customizable user and control consoles
 - » Event scheduler
 - » Diagnostic console
- Simplified Configuration Software
 - » Drag & drop A/V and channel objects
 - » Selectable Console views—Unit, Matrix, and Channel
- Expanded serial command set

Superior Audio Performance

- Next-generation Distributed Echo Cancellation® on every mic input
- First-mic priority delivers clear audio to the far end
- 20 Hz-22 kHz bandwidth for full-range audio response
- ALC & AGC keep participants' audio balanced and consistent

Configuration Flexibility

- Scalable – link multiple Converge Pro units (880, 840T, 8i, TH20) for extensive microphone coverage and up to 16 phone lines
- Enhanced expansion bus, featuring 12 mix-minus audio buses for routing between units
- Eight mic gating groups (four internal & four global) allow separation of mics into individual mixer gating groups for greater configuration flexibility
- 32 presets can be executed on-the-fly without disturbing other ongoing preset operations
- 255 Macros for customized audio control/configuration with single command execution

Conferencing Capability

- Link with multiple Converge Pro units for a total of up to 16 telephone lines and 64 mic inputs

Converge Pro TH20



The successor to the industry-leading XAP® TH2. The TH20 enables conference call functionality for Converge™ Pro installations with its single telephone line connection. Up to 16 units can be linked for greatly expanded conferencing capability. It also adds two line-level inputs and outputs for increased system capacity.

Converge Pro TH20 advantages:

Advanced Telephone Conferencing Feature Set

- Signal Processing Improvements
 - » Telephone noise cancellation on RX channel
 - » ClearEffect speech enhancement
 - » Automatic level control on RX channel
 - » Caller ID
 - » Selectable ringers
- Increased I/O capabilities
 - » Two line level inputs and two line-level outputs
 - » Audio Expansion bus (E-bus)
- Management Improvements
 - » Integrated Ethernet and USB connections
 - » SNMP and HTML remote management agents with SMTP email alerts
 - » Web-based, customizable user and control consoles
 - » Event scheduler
 - » Diagnostic console
- Simplified Configuration Software
 - » Drag & drop A/V and channel objects
 - » Selectable Console views—Unit, Matrix, and Channel
- Expanded serial command set

Superior Audio Performance

- Next-generation Distributed Echo Cancellation® on every mic input
- 20 Hz-22 kHz bandwidth for full-range audio response
- AGC on line inputs keeps audio balanced and consistent

Configuration Flexibility

- Scalable – link multiple Converge Pro units (880, 840T, 8i, TH20) for extensive microphone coverage and up to 16 phone lines
- Enhanced expansion bus, featuring 12 mix-minus audio buses for routing between units
- Eight mic gating groups (four internal & four global) allow separation of mics into individual mixer gating groups for greater configuration flexibility
- 32 presets can be executed on-the-fly without disturbing other ongoing preset operations
- 255 Macros for customized audio control/configuration with single command execution

Conferencing Capability

- Link with multiple Converge Pro units for a total of up to 16 telephone lines and 64 mic inputs

CUSTOMER SERVICE AND SUPPORT

ClearOne is committed to providing best-in-class customer service and support. If you need assistance installing, configuring, or operating your Converge Pro system, or if you have questions about ClearOne products or services, please contact us at one of the locations listed below. ClearOne also welcomes your comments and suggestions so we can continue to improve our products and serve our customers' needs.

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PRODUCT REGISTRATION

Register your Converge Pro product(s) online at <http://www.clearone.com/support/registration.php?content=main>.

Registering your Converge Pro product(s) enables ClearOne to provide you with better technical assistance, and to notify you of important information regarding your Converge Pro product including available upgrades, technical bulletins, and new product information.

WARRANTY INFORMATION

ClearOne Communications, Inc. warrants that this Converge Pro product is free of defects in both material and workmanship. For complete warranty information including length, coverage, and limitations, visit <http://www.clearone.com/support/warranty.php?content=main>

OPERATING REQUIREMENTS

Power

Converge Pro devices automatically accommodate voltages of 100–240 VAC, 50/60 Hz, 15 W.

Telephone

Converge Pro devices operate on a standard analog telephone line and connect to the telephone system with a standard RJ-11 modular jack. If you do not have an RJ-11 jack where you want to install your Converge Pro, call your local telephone company for installation. Converge Pro 840T and TH20 can be configured to meet compliance requirements of different countries via the Console software.



WARNING: The country code must be set correctly in Console to ensure that the unit operates properly when connected to the telco network, and that it complies with the country's telco requirements. Changing this code to a country other than the intended country of operation might cause Converge Pro devices to be non-compliant.

Equipment Placement

Converge Pro devices are designed for installation in a standard 19-inch equipment rack.

Environmental

Converge Pro devices are designed to operate at ambient unit temperatures between 14° F (-10° C) and 122° F (50° C).

SYSTEM REQUIREMENTS

The Converge Pro Console software minimum system requirements are:

Supported Operating Systems

- Windows XP
- Windows 2000
- Windows Vista

Minimum System Requirements

- Processor: 300 Mhz Pentium III (or AMD equivalent)
- RAM: 256 Megabytes RAM
- Video: 1024x768 SVGA (16 bit)
- Hard Drive: 40 Megabytes
- Network: 10/100 Mbps Ethernet
- USB Port: Version 1.0
- CD Drive: CD/DVD ROM

Minimum Software Requirements

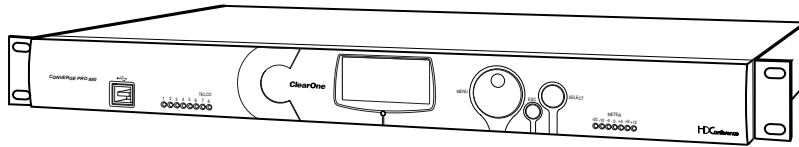
- Browser: Microsoft Internet Explorer version 4.0 or higher
- Adobe Flash: Version 9.0 or higher
- Java: Sun Microsystems' Java Runtime Environment version 6.0 or higher

UNPACKING

Use the pack-out diagrams below to verify that you received all components for your Converge Pro product.

NOTE: ClearOne is not responsible for product damage incurred during shipment. You must make claims directly with the carrier. Inspect your shipment carefully for obvious signs of damage. If the shipment appears damaged, retain the original boxes and packing material for inspection by the carrier. Contact your carrier immediately.

Converge Pro 880 Package Contents



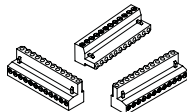
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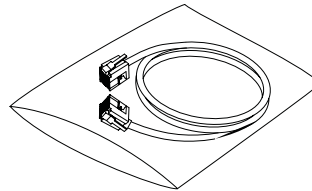
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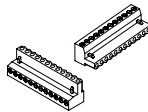
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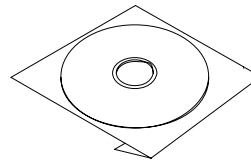
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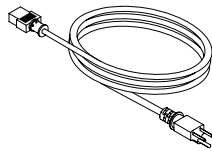
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830-150-004 (QTY 1)



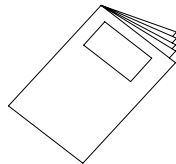
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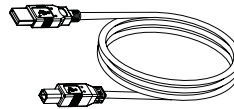
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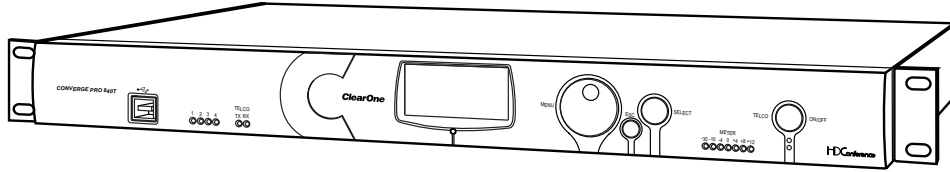


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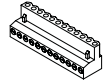


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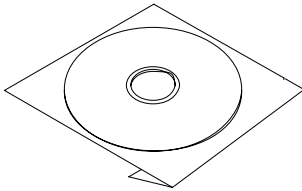
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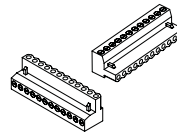
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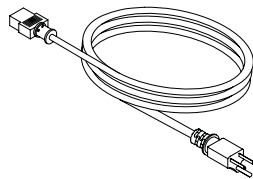
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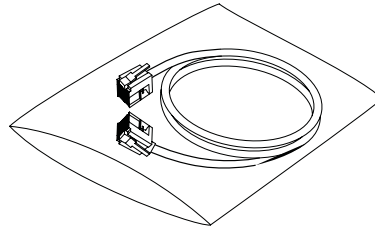
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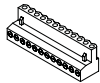
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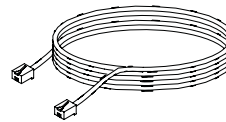
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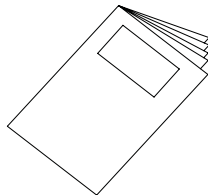
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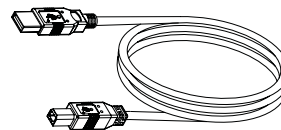
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673-017-112 (QTY 1)



CABLE ASSY, TELEPHONE 12FT.
830-000-012 (QTY 1)

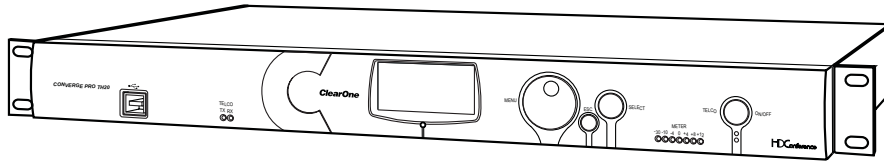


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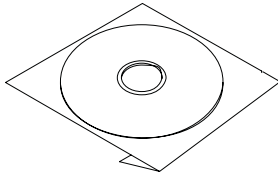


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830-153-001 (QTY 1)

Converge Pro TH20 Package Contents



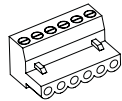
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910-151-820 (QTY 1)



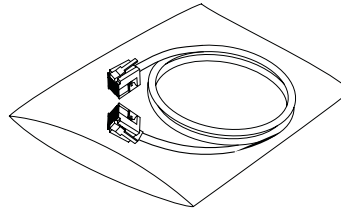
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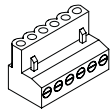
SCREW/W ASHER ACC KIT ,RACK DECOR 4EA BLK
680-000-001 (QTY 1)



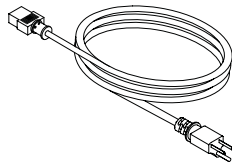
CONN, TERM BLOCK/F 6 POS 3.18 MM SPC BLACK PHOENIX
673-017-006 (QTY 1)



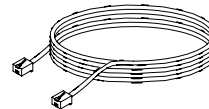
CABLE ASSEMBLY, RJ45/RJ45 18"
830-150-004 (QTY 1)



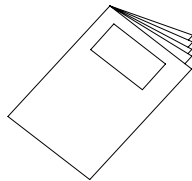
CONN, TERM BLOCK/F 6 POS 3.81 MM SPC GREEN PHOENIX
673-017-016 (QTY 1)



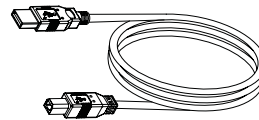
PWR CORD, MOLDED 8' BLK 3 COND
699-150-006 (QTY 1)



CABLE ASSY, TELEPHONE 12FT
830-000-012 (QTY 1)

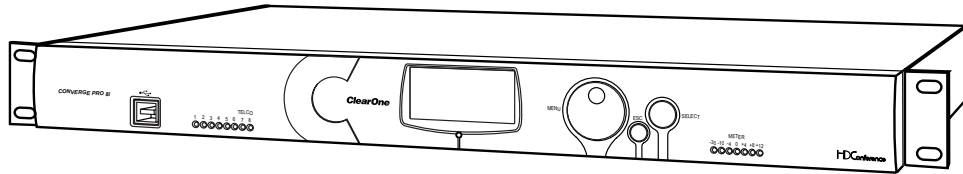


MANUAL, CONVERGE TH20
800-151-820 (QTY 1)

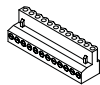


CABLE ASSY, USB A-B TYPE 6FT
830-153-001 (QTY 1)

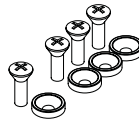
Converge Pro 8i Package Contents



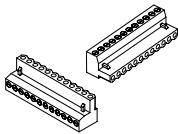
CONVERGE PRO 8i
910-151-810 (QTY 1)



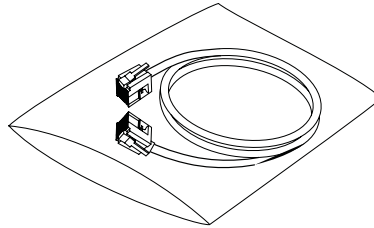
CONN, TERM BLOCK/F 12 POS GREEN
673-017-212 (QTY 1)



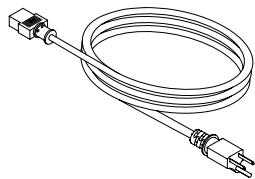
SCREW/W ASHER ACC KIT ,RACK DECOR 4EA BLK
680-000-001 (QTY 1)



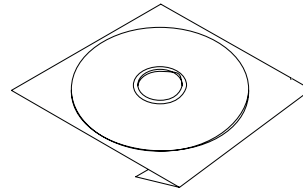
CONN, TERM BLOCK/F 12 POS ORANGE
673-017-1 12 (QTY 2)



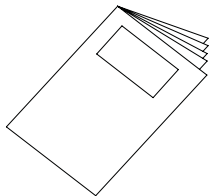
CABLE ASSEMBL Y,RJ45/RJ45 18"
830-150-004 (QTY 1)



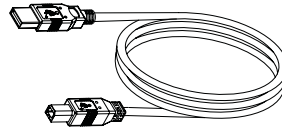
PWR CORD, MOLDED 8' BLK 3 COND
699-150-006 (QTY 1)



CD, MANUAL CONVERGE 880/840/TH20/8i
800-151-881 (QTY 1)



MANUAL, CONVERGE 8i
800-151-810 (QTY 1)



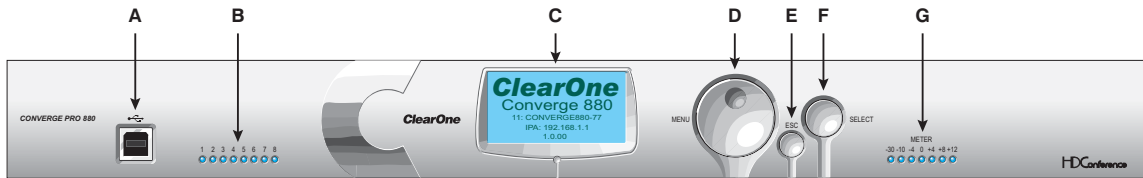
CABLE ASSY ,USB A-B TYPE 6FT
830-153-001 (QTY 1)

CONTROLS AND CONNECTIONS

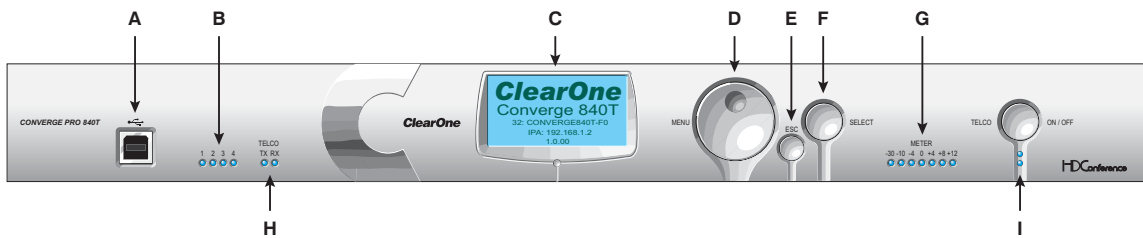
Refer to the following diagrams for Converge Pro front panel controls and the back panel connections.

Converge Pro Front Panels

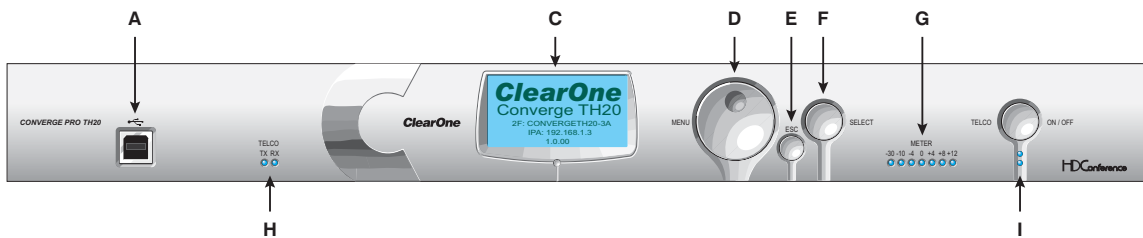
Converge Pro 880 Front Panel



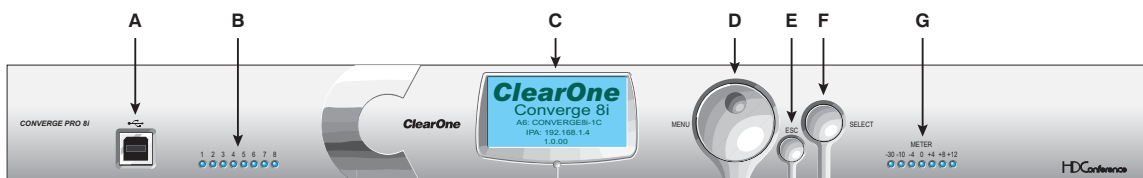
Converge Pro 840T Front Panel



Converge Pro TH20 Front Panel



Converge Pro 8i Front Panel

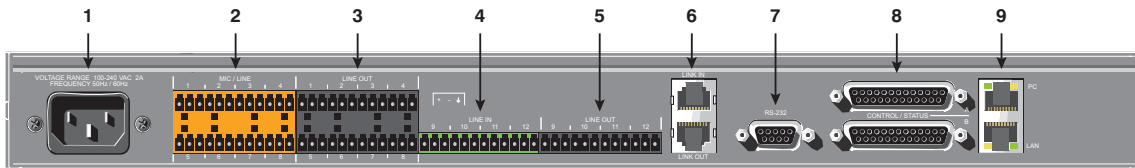


Converge Pro Front Panel Control Descriptions

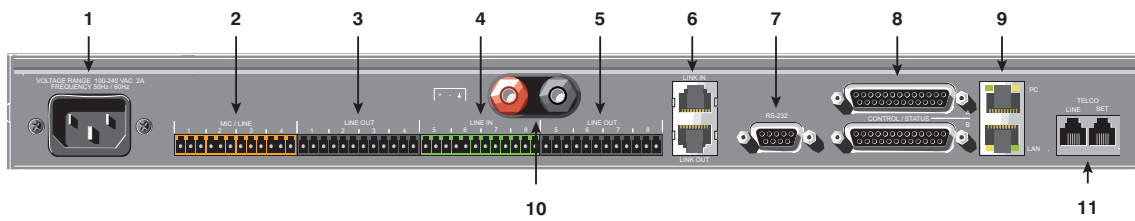
- A. USB Type B Port:** Provides convenient front panel connectivity for laptops, computers, and other USB devices.
- B. Microphone-On LEDs:** Indicate microphone gate and mute status.
- C. LCD Display:** The LCD display shows model number, unit name, IP address, programming menu pages, menu options, configuration settings, and parameter values.
- D. Menu Dial:** The Menu Dial navigates the Converge Pro LCD programming menu and enables you to select and modify configuration settings.
- E. ESC Button:** The ESC button returns you to the previous screen on the LCD display.
- F. Select Button:** The Select button displays the Converge Pro LCD programming menu and selects the highlighted menu option.
- G. LED Bar Meter:** The LED bar meter displays the audio level of a selected input, output, processing, or fader channel. Default meters: 880-Output 12, 840T-Output 8, TH20-Telco Tx, 8i-Mic 1.
- H. Telco TX/RX LEDs:** The Telco TX/RX LEDs display transmit, receive, and mute status of the connected telephone line (840T and TH20 only).
- I. Telco On/Off Button & LEDs:** The Telco On/Off button connects and disconnects the connected telephone line. The LEDs indicate the connection status (840T and TH20 only).

Converge Pro Rear Panels

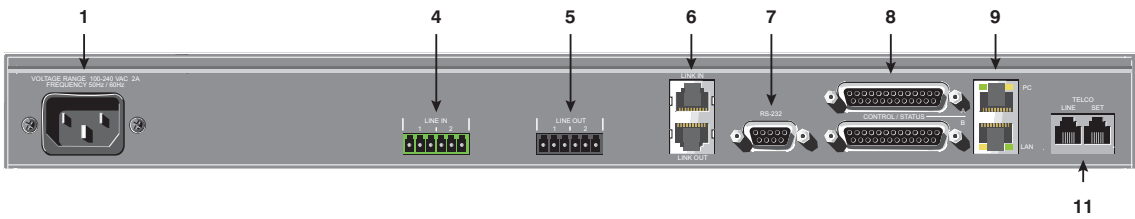
Converge Pro 880 Rear Panel



Converge Pro 840T Rear Panel



Converge Pro TH20 Rear Panel



Converge Pro 8i Rear Panel



Converge Pro Rear Panels

- 1. AC Power:** IEC connector, 100–240VAC auto-adjusting, 50/60Hz.
- 2. Mic/Line Inputs:** Mini-terminal push-on block connector for any combination of microphone and/or line level inputs. (Converge Pro 880: 8 inputs. Converge Pro 840T: 4 inputs. Converge Pro 8i: 8 inputs. Converge Pro TH20: 0 inputs.)
- 3. Line Outputs:** Mini-terminal push-on block connector for line-level outputs. (Converge Pro 880 and 840T only.)
- 4. Line Inputs:** Mini-terminal push-on block connector for line-level inputs only. (Converge Pro 880: 4 inputs. Converge Pro 840T: 4 inputs. Converge Pro 8i: 4 inputs. Converge Pro TH20: 2 inputs.)
- 5. Line Outputs:** Mini-terminal push-on block connector for line-level outputs (Converge Pro 880, 840T, and TH20 only).
- 6. Link In and Link Out Ports:** Two RJ-45 E-bus (expansion bus) connectors used to connect multiple Converge Pro units together to create a site. You can connect up to eight Converge Pro 840T/880/8i units, up to 16 Converge Pro TH20 units, or any combination thereof, where the total number of microphone inputs does not exceed 64. Maximum cable length is 200 feet using Category 5 unshielded twisted pair (UTP) cable.



WARNING: Use the **Link In** and **Link Out** ports with Converge Pro Devices ONLY. Connecting ANY other devices to the Link In and Link Out ports, including ClearOne XAP products or Power Over Ethernet (PoE) devices, will result in severe equipment damage.

- 7. RS-232 Serial Port:** Female DB9 connector for connecting to a laptop, computer, or remote control serial devices (such as AMX and Crestron).
- NOTE:** Converge Console software cannot connect via the RS-232 port; use USB or Ethernet.
- 8. Control/Status A and B Ports:** Two female DB25 connectors used for General Purpose Input/Output (GPIO) interactions between Converge Pro devices and external control devices (such as wall switches and push-to-talk microphones). This enables external devices and controller software to access the Converge Pro command set, including common functions such as volume control, muting, room combining, and preset changes.
 - 9. PC and LAN Ethernet Ports:** Two RJ-45 10/100 auto-sensing Ethernet ports. The LAN Ethernet port is used to connect Converge Pro devices to a network. The PC Ethernet port provides a pass-through network connection for use with a standard (not crossover) patch cable. The LEDs adjacent to each port indicate connection status and packet traffic activity.
 - 10. Speaker Posts:** Two post/banana plug connectors used to connect an external speaker (4Ω - 16Ω). An internal 10W power amplifier eliminates the need for an external power amplifier. (Converge Pro 840T only.)
 - 11. Telco Line and Set Ports:** Two RJ-11 connectors telephone ports. The Telco Line port is used to connect an analog telephone line to Converge Pro devices. The Telco Set port provides a pass-through connection for telephone handsets. (Converge Pro 840T and TH20 only.)

NOTE: The Set port is not active (available for use) when the hybrid is off-hook.

CHAPTER 2: EXPANSION BUS & LCD PROGRAMMING

EXPANSION BUS

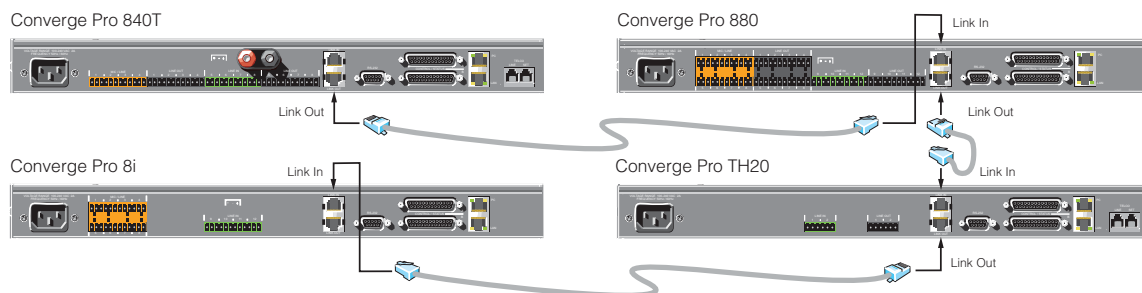
The Converge Pro Expansion Bus (E-bus) allows you to connect multiple Converge-Pro units together to create powerful audio and conferencing solutions for any size venue. The E-bus is a proprietary digital audio bus that provides control and audio data links between Converge Pro devices.

Expansion Bus Connections

Using the E-bus Link In and Link Out ports, you can connect up to 28 Converge Pro 840T/880/8iS and 16 Converge Pro TH20 units, where the total number of microphone inputs does not exceed 64.

Connect Converge Pro units in daisy-chain fashion (as shown below) using the 18" straight-through patch cable included with each unit (Part # 830-150-004). For larger distances between units, use CAT 5 twisted pair cable with RJ-45 connectors.

The maximum cable length between connected Converge Pro units is 200 feet (61 meters).



Audio and Control Buses

The E-bus allows audio routing between source devices and destination devices on the E-bus network. The E-bus contains 12 independent digital audio buses labeled O–Z, which can route mic or line inputs in any combination across the E-bus network. The E-bus also contains four PA adapt/acoustic echo cancellation reference buses, four global gating buses, and one control bus.

O–R Buses: These four audio buses are generally used for routing microphone audio between Converge Pro devices. Information about the number of gated microphones (NOM count) and other relevant information for the microphone mixers are tracked for microphones routed to these buses. By default, all microphones are routed to the O bus.

S–Z Buses: These eight buses are line input mixer buses. They are used to route auxiliary audio, such as from a CD player or VCR, to and from other units on the network. These buses are also used as mic mixer buses when NOM count is not required.

PA Adapt/Acoustic Echo Cancellation Reference Buses: These buses allow an input from a Converge Pro device to reference an output on another linked Converge Pro device for AEC purposes. See *AEC Reference* and *AEC* for more information.

Global Gating Groups A-D: These buses are microphone gating groups that support First-Mic Priority, maximum number of mics, etc. and work across all linked Converge devices. Unlike the audio buses, they contain only mic status and gate parameters. See *Mic Gating* and *Gating Groups* for more information.

Control Bus: The control bus is an independent channel from the E-bus's audio channel. This allows control information to pass even if the units are not using the audio link. Converge Pro devices support the use of the serial command set through the control bus.

DEVICE IDS

Device IDs provide unique identifiers for all Converge Pro units that are linked together. After making E-bus connections between Converge Pro units, you must set a unique Device ID number for all units of the same Device Type in the network.

Device Types and IDs

Converge Pro Device Types and Device IDs by model are as follows:

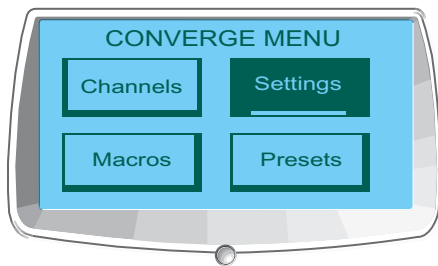
Model	Device Type	Device ID Range
880	1	0-7
TH20	2	0-F
840T	3	0-7
8i	A	0-7

NOTE: All Converge Pro units ship from the factory with a default DID of 0.

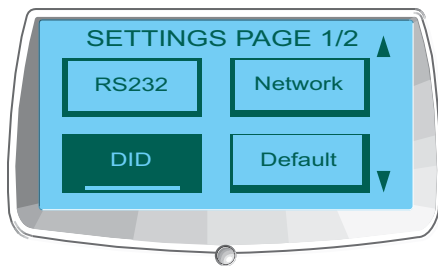
Assigning Device IDs

Use the following procedure to assign device IDs using the front panel controls:

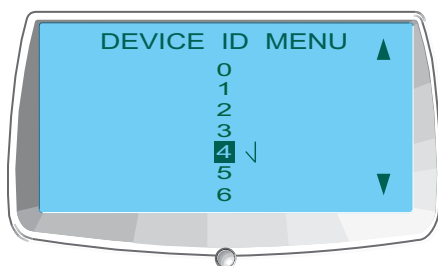
1. Press the **Select** button on the front panel. The **Converge Menu** appears.



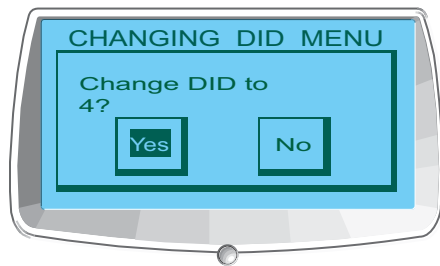
2. Use the **Menu Dial** to highlight the **Settings** menu. Press the **Select** button. The **Settings** menu appears.



3. Use the **Menu Dial** to highlight **DID**. Press the **Select** button. The **Device ID** menu appears.



- Use the **Menu Dial** to highlight the desired value. Press the **Select** button to select it.
- The **Change DID Menu** prompt appears. Choose **Yes** to set the selected DID value, or **No** to return to the **Device ID** menu.

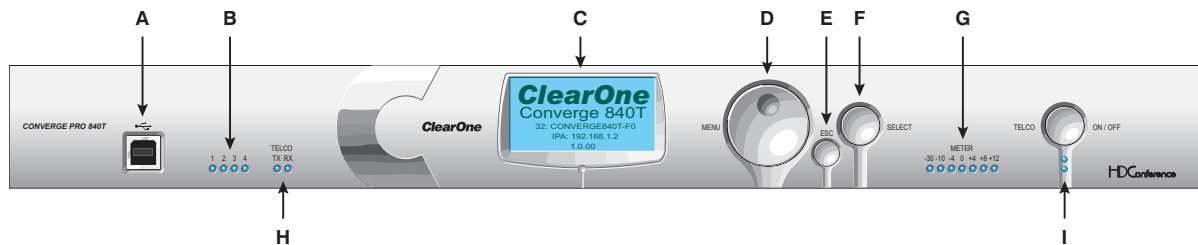


- Press **Esc** until to return to the **Settings** menu.
- Repeat this process for each Converge Pro device on the E-bus network.

NOTE: You can also set Device IDs in the Unit Properties screen in Console (when disconnected). However, DID assignments made in Console must match the DID assignments made using the front panel.

LCD PROGRAMMING OVERVIEW

LCD Programming allows you to make simple configuration adjustments to your Converge Pro unit using easy and intuitive front panel controls (shown below).



- A. USB Type B Port:** Provides convenient front panel connectivity for laptops and PCs.
- B. Microphone-On LEDs:** These LEDs indicate microphone gate and mute status.
- C. LCD Display:** The LCD display shows model number, unit name, IP address, programming menu pages, menu options, configuration settings, and parameter values.
- D. Menu Dial:** The Menu Dial navigates the Converge Pro LCD programming menu and enables you to select and modify configuration settings.
- E. ESC Button:** The ESC button returns you to the previous screen on the LCD display.
- F. Select Button:** The Select button displays the Converge Pro LCD programming menu and selects the highlighted menu option.
- G. LED Bar Meter:** The LED bar meter displays the audio level of a selected input, output, processing, or fader channel. Default meters: 880-Output 12, 840T-Output 8, TH20-Telco Tx, 8i-Mic 1.
- H. Telco TX RX LEDs:** The Telco TX RX LEDs display transmit, receive, and mute status of the connected telephone line (840T and TH20 only).
- I. Telco On/Off Button & LEDs:** The Telco On/Off button connects and disconnects the connected telephone line. The LEDs indicate the connection status (840T and TH20 only).

In addition to making configuration adjustments from the front panel, you can also run macros and execute presets. For more information on using Converge Pro front panel controls, see *Controls and Connections*.

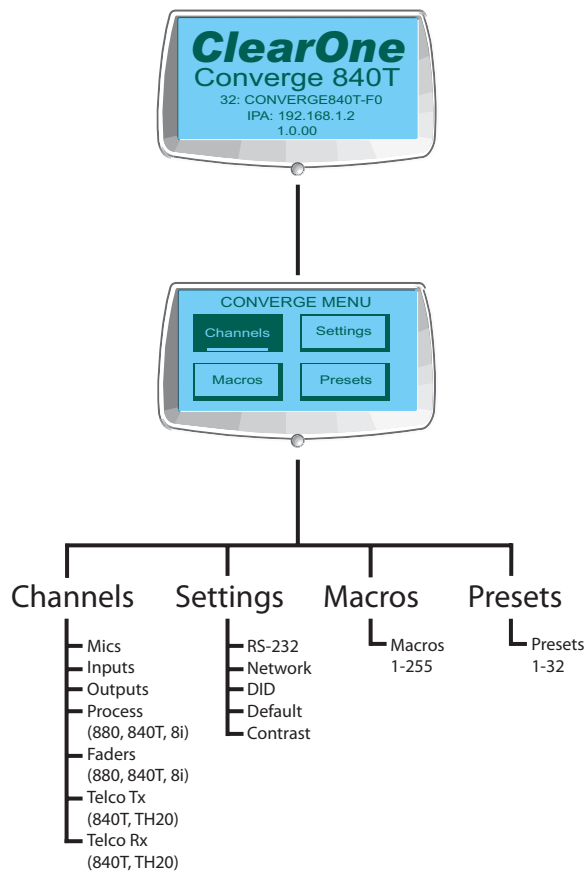
Adjusting LCD Menu Parameters

Use the following procedure to adjust LCD Menu parameters for your Converge Pro units(s):

1. Press the **Select** button to access the **Converge Menu**.
2. Scroll to the parameter you want to adjust using the **Menu Dial**.
3. Press the **Select** button to select the parameter. The parameter will stop flashing when selected.
4. Select the value for the parameter using the **Menu Dial**.
5. Press the **Select** button to save the parameter value. To discard the change and return to the previous menu, press the **Esc** button.

NOTE: Use the Converge Pro Console software in Configuration Mode for advanced system configuration.

LCD Menu Tree



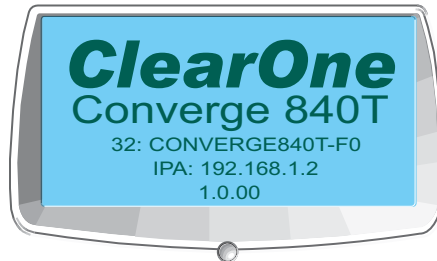
As shown above, the main menus on the LCD display are:

- Channels
- Settings
- Macros
- Presets

LCD Default Display

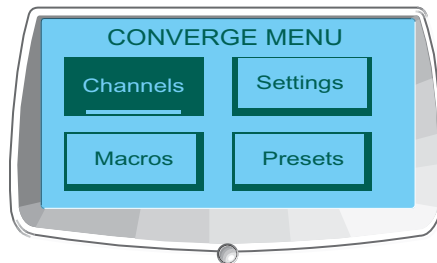
When you power up a Converge Pro unit, the LCD display reads **Initializing**. If an error occurs, contact ClearOne Technical Support.

When initialization is complete, **ClearOne Converge[Model Number]** appears on the LCD panel, along with the device type, device ID, device name, IP address, and firmware revision level as shown below.



Model
DeviceType, ID, Name
IP Address
Firmware Level

To access the LCD menu, press the **Select** button. The **Converge Menu** appears as shown below.



Front Panel Lock

Using Console, you can create a PIN code and lock the front panel to prevent unauthorized access to LCD menu functions. When the lock feature is enabled and the front panel is unlocked, it will automatically re-lock after 3 minutes of inactivity. See the *Unit Properties* topic for instructions on how to enable the lock feature.

For more information, see the *Table of Contents* for these related topics:

- **Macros**
- **Presets**
- **Controls and Connections**
- **Console Configuration Mode**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco RX Settings (840T and TH20)**
- **Telco TX Settings (840T and TH20)**
- **Processing Settings**
- **Output Settings**
- **LCD Channels Menu**
- **LCD Settings Menu**
- **LCD Macros Menu**
- **LCD Presets Menu**
- **Device IDs**
- **Unit Properties**

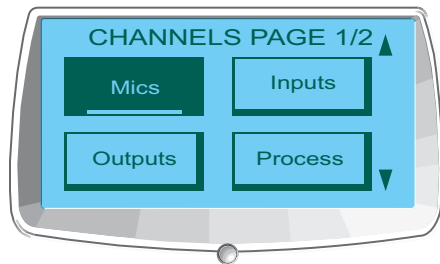
LCD CHANNELS MENU

The **LCD Channels Menu** allows you to adjust the gain level and turn mute on or off for all channels on a Converge Pro unit.

Accessing the Channels Menu

To access the **Channels** menu, press the **Select** button on the front panel, use the **Menu Dial** to select **Channels**, and press the **Select** button.

The **Channels** menu appears as shown below:



Channels menu options (i.e. channel types) include:

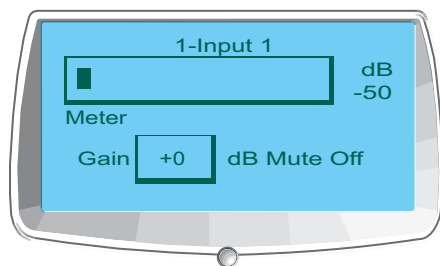
- **Mics** (880, 840T, 8i)
- **Inputs**
- **Outputs** (880, 840T, TH20)
- **Process** (880, 840T, 8i)
- **Faders** (880, 840T, 8i)
- **Telco Tx** (840T, TH20)
- **Telco Rx** (840T, TH20)

After you select an option, a list of all available channels of that type is displayed. Use the **Menu Dial** to select the channel you want to configure and press the **Select** button. The **Channels** display appears.

Channel Display

The channel display is identical for every channel type, with the exception of the channel ID and channel label, which both vary depending on the channel selected.

As shown below, the display includes a peak-level meter, a peak dB reading, a gain level adjustment box, and a mute selector.



Setting Channel Gain and Mute

The procedure for setting gain and mute is the same for all channel types:

1. Use the **Menu Dial** to highlight **Gain** or **Mute**

2. Press the **Select** button
3. Select the desired value using the **Menu Dial**
4. Press the **Select** button to set the selected value
5. Press the **Esc** button to return to the **Channels** menu

NOTE: When mute is set to on for a mic input channel, the **Microphone-On LED** for that channel illuminates red on the front panel.

For more information, see the *Table of Contents* for these related topics:

- **LCD Programming Overview**
- **LCD Channels Menu**
- **LCD Settings Menu**
- **LCD Macros Menu**
- **LCD Presets Menu**
- **Controls and Connections**
- **Mic Input Settings**
- **Line Input Settings**
- **Output Settings**
- **Process Settings**
- **Fader Settings**
- **Telco Tx Settings** (840T, TH20)
- **Telco Rx Settings** (840T, TH20)

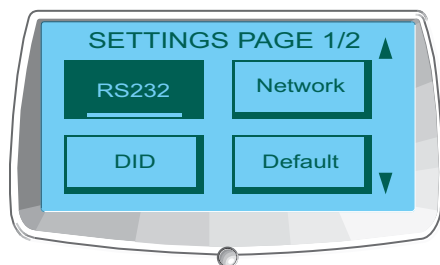
LCD SETTINGS MENU

The **LCD Settings Menu** allows you to configure serial port settings and Device IDs, view network IP settings, change the LCD contrast level, and restore factory default settings for a Converge Pro unit.

Accessing the Settings Menu

To access the **Settings** menu, press the **Select** button on the front panel, use the **Menu Dial** to select **Settings**, and press the **Select** button.

The **Settings** menu appears as shown below:



Settings menu options include:

- **RS-232**
- **Network**
- **DID**
- **Default**
- **Contrast**

These options are described in the following sections.

RS-232

There are two parameters in the RS-232 menu: **Baud Rate** and **Flow Control**. To change these settings, use the following procedure:

1. Use the **Menu Dial** to highlight **Baud Rate** or **Flow Control**
2. Press the **Select** button
3. Select the desired value using the **Menu Dial**
4. Press the **Select** button to set the selected value
5. Press the **Esc** button to return to the **Settings** menu

You can also use the Comm tab of the Unit Properties screen to change these settings.

Baud Rate

This parameter allows you to set the baud rate to 9.6kbps, 19.2kbps, 38.4kbps, 57.6kbps, or 115.2kbps. The default is 57.6 kbps. Select the baud rate you want to use, then press the **Select** button. A message appears on the LCD display indicating the change is in progress, and another indicating the change is complete. When finished, the display returns to the RS-232 sub-menu.

Flow Control (Hardware)

Converge Pro devices use the RTS and CTS pins on the RS-232 port to regulate the transmission and reception of data. You can enable or disable flow control on the front panel, of unit and select the flow control type in the Unit Properties window in Console.

If you select **On** (default) from the front panel LCD menu, select **Hardware** as the flow control type in the **Unit Properties** window. If you disable flow control on the front panel, select **None** in the **Unit Properties** window. When None is selected, Converge Pro units ignore flow control, and the connected external control device ensures that data is not lost.

NOTE: ClearOne recommends that you leave Flow Control enabled and connect all DB9 pins to avoid communication errors.

Network

The **Network** submenu displays the unit name, IP address, Gateway, and Subnet Mask settings for the Converge Pro unit. You cannot change any of these settings from the **Network** submenu. Use the **Unit Properties** screen in the **Console** software to change these settings.

DID

The **DID** submenu allows you to select a Device ID for the Converge Pro unit. Select the DID you want to use, press the **Select** button. Answer **Yes** to the prompt to change the DID, or **No** to keep the existing setting.

You can also use the General tab of the Unit Properties screen in Console to change this setting when disconnected from the unit. However, DID assignments made in Console must match DID assignments made using the front panel.

Default

Default restores **ALL** settings to their factory default values. Answer **Yes** to the prompt to restore default settings, or **No** to retain the existing settings.

WARNING: Using Default resets the unit and restores ALL settings to their factory defaults, including advanced settings configured using Console.

Contrast

Contrast allows you to change the LCD contrast level. Use the **Menu Dial** to adjust the contrast level, then press the **Select** button to save it.

For more information, see the *Table of Contents* for these related topics:

- **LCD Programming Overview**
- **LCD Channels Menu**
- **LCD Macros Menu**
- **LCD Presets Menu**
- **Site Properties**
- **String Tab**
- **Unit Properties**

LCD MACROS MENU

The **LCD Macros Menu** allows you to run macros from the Converge Pro front panel. To record Macros, use the Macro Tab in Console.

Accessing the Macros Menu

To access the Macros menu, press the **Select** Button on the front panel, use the **Menu Dial** to select **Macros**, and press the **Select** Button.

The **Macro Menu** appears as shown below:



Executing Macros

Use the following procedure to run macros from the front panel LCD display:

1. Use the **Menu Dial** to highlight the macro you want to run
2. Press the **Select** button
3. Answer **Yes** at the prompt that appears to run the selected macro, or **No** to cancel.
4. Press the **Esc** button to return to the main LCD menu.

You can also run macros using the Macro tab or the Services menu in Console.

For more information, see the *Table of Contents* for these related topics:

- **LCD Programming Overview**
- **LCD Settings Menu**
- **LCD Channels Menu**
- **LCD Presets Menu**
- **Macro Tab**

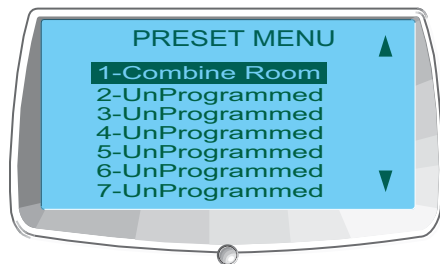
LCD PRESET MENU

The **LCD Preset Menu** allows you to execute presets from the Converge Pro front panel. To create presets, use Console in Preset Mode.

Accessing the Presets Menu

To access the menu, press the **Select** button on the front panel, use the **Menu Dial** to select **Presets**, and press the **Select** Button.

The **Preset Menu** appears as shown below:



Executing Presets

Use the following procedure to execute presets from the front panel LCD display:

1. Use the **Menu Dial** to highlight the preset you want to execute
2. Press the **Select** button
3. Answer **Yes** at the prompt that appears to run the selected preset, or **No** to cancel
4. Press the **Esc** button to return to the main LCD menu

You can also run presets from the Services menu while Console is in Configuration Mode.

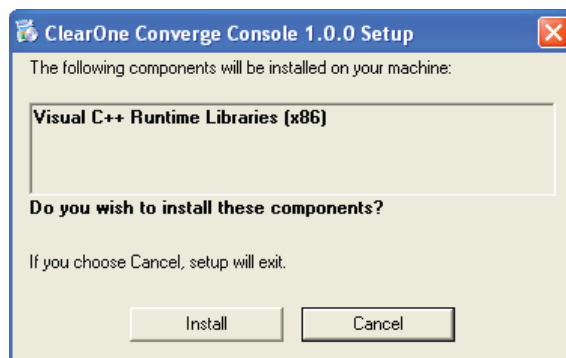
For additional information, refer to the *Table of Contents* for these related topics:

- **LCD Programming Overview**
- **LCD Settings Menu**
- **LCD Channels Menu**
- **Preset Mode**
- **Console Overview**
- **Services Menu Overview**
- **Configuration Mode Overview**

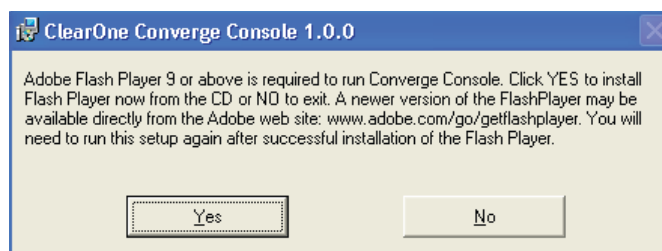
CHAPTER 3: CONVERGE CONSOLE PROGRAMMING

INSTALLING CONVERGE CONSOLE

1. Boot the PC to the Windows operating system.
2. Ensure that all other programs or applications are closed.
3. Disconnect any USB cables from all Converge Pro devices (reconnect them after installation is complete).
4. Insert the **Converge Pro Installation & Documentation** CD into the CD-ROM or DVD-ROM drive.
5. If the **Autorun** feature is enabled on the PC, the **Converge Pro Installation** window opens automatically. Click the **Converge Console Software** menu option on the left side of the screen to begin installation. If **Autorun** is not enabled, or the **Converge Pro Installation** window does not automatically appear, open the Windows **Start** menu and choose **Run**. Type **<drive>:\console\setup.exe** where **<drive>** is the letter of the CD-ROM or DVD-ROM drive (e.g. D:\console\setup.exe). Alternatively, press the **Browse** button in the Run dialog, navigate to the directory, and double-click on **setup.exe**.
6. When the **Converge Pro Installation & Documentation** CD window appears, click the **Converge Console Software** menu option on the left side of the screen.
7. The setup program begins by installing Visual C++ runtime libraries. When prompted, click the **Install** button (shown below).



8. When the libraries complete installation, Setup checks the system for Adobe Flash. If Adobe Flash is not installed, Setup starts the Flash installation with a dialog (shown below).



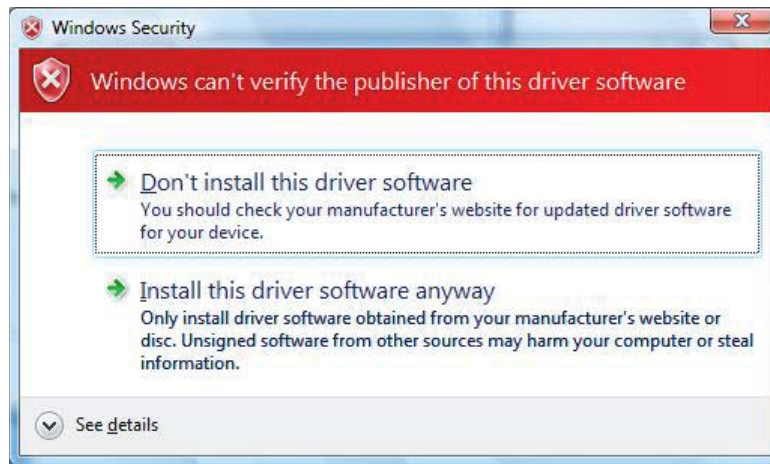
9. Press **Yes** to install Adobe Flash. Once flash installs, you will need to repeat this installation procedure starting at step six to complete the Console software installation.

NOTE: Adobe Flash is required to use Console. Pressing **No** will abort the Flash installation, and the Console installation will also terminate.

10. The **Converge Console Setup Wizard** appears. Press the **Next** button and navigate through the **License Agreement** and **Information** screens that appear.
11. At the **Select Installation Folder** window, choose the directory where you want to install Console. Press the **Disk Cost** button to analyze available and required free space (if needed).

NOTE: ClearOne recommends that you use the default directory when installing Console.

12. Press the **Next** button until installation starts.
13. A Windows unsigned driver warning dialog appears as shown below. Click **Continue Anyway** (Windows XP) or **Install this driver software anyway** (Windows Vista) to proceed with USB device driver installation.



NOTE: If you click **STOP Installation** (Windows XP) or **Don't install this driver software** (Windows Vista), Windows will terminate USB device driver installation. The Console software will complete installation, and it will function properly over IP. However, you will not be able to connect to any Converge Pro devices via USB, and Console will not function over USB.

14. Follow the instructions that appear on-screen to complete installation.



15. When installation is complete, the Converge Console icon appears on your desktop. You can now start Console by double-clicking the icon, or through the **All Programs > ClearOne Communications > Converge Console** program group on the Windows **Start** menu.
16. Connect USB cables between the PC and Converge Pro devices (if you will be using USB to run Console).
17. Connect Ethernet cables between your LAN and Converge Pro devices (if you will be using IP to run Console).

Default User ID and Password

Connecting to a Converge Pro site with Console requires a username and password. The defaults are:

- Username: **clearone**
- Password: **converge**

NOTE: Usernames and passwords are not case sensitive.


NOTE: ClearOne recommends that you record usernames and passwords and store them in a secure place. **There is no way to retrieve passwords.** If you forget a password, the only way to connect to a Converge Pro device is to default the unit.

CONVERGE CONSOLE OVERVIEW

The **Converge Console** software provides a powerful, intuitive interface for configuring and controlling your Converge Pro system. While you can use LCD Programming for some simple configuration tasks, you must use Console for the advanced configuration tasks required to customize Converge Pro units for your application.

Accessing Converge Console



Start Converge Console by double-clicking the  desktop icon, or by clicking the **Start** button in Windows and selecting **All Programs > ClearOne Communications > Converge Console > Converge Console** from the program list.

After Console loads, you can open an existing **Site File** from the **File** menu, or create a new site file by selecting **New Site**. When a site file is opened, Console displays the **Unit Tab** as shown below.

Default User ID and Password

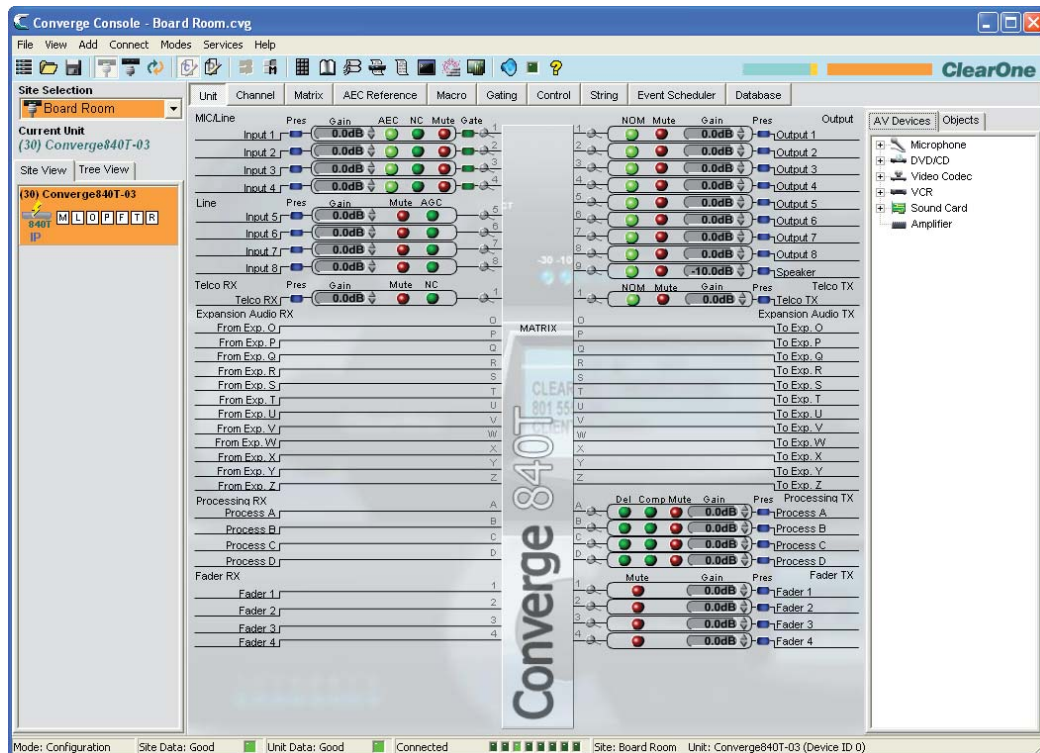
Connecting to a Converge Pro site with Console requires a username and password. The defaults are:

- Username: **clearone**
- Password: **converge**

NOTE: Usernames and passwords are not case sensitive.

After connecting, you can add/modify user IDs, change passwords, and set access privileges using **Site Properties**.

Navigating Converge Console



The Console window consists of the components described in the following sections.

Menu Bar
























Menus available on the Menu Bar include:

- **File**
- **View**
- **Add**
- **Connect**
- **Modes**
- **Services**
- **Help**: Opens this help system and provides software and firmware version information.

Button Bar



Controls on the Button Bar include:

-  **Create Site**
-  **Open Site**
-  **Save Site**
-  **Connect**
-  **Disconnect**
-  **Refresh Site**: Refreshes the site data displayed based on current status.
-  **Configuration Mode**
-  **Preset Mode**
-  **Execute Preset**
-  **Run Macro**
-  **Dialer**
-  **Phonebook**
-  **Label Editor**
-  **Device Log**
-  **Event Log**
-  **Debug Console**
-  **Web Builder**
-  **Firmware Loader**
-  **Safety Mute**: Toggles Safety Mute on and off. Safety Mute holds all outputs in a muted state.
-  **Signal Generator LED**: Flashes green when the signal generator for any unit in the site is turned on.
-  **Help**: Opens this help system; provides software and firmware version information.

Tab Bar

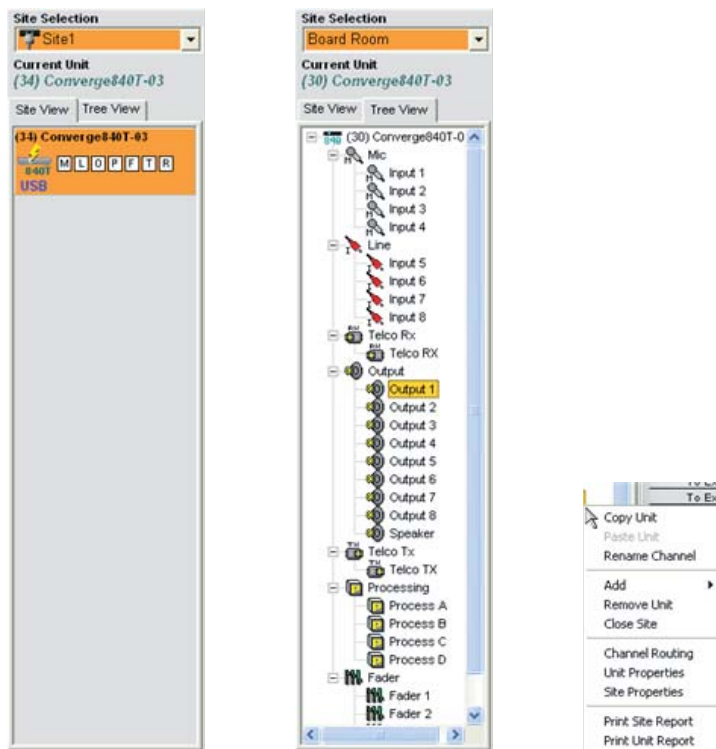


Tabs available on the Tab Bar include:

- **Unit**
- **Channel**
- **Matrix**
- **AEC Reference**
- **Macro**
- **Gating**
- **Control**
- **String**
- **Event Scheduler**
- **Database**

Clicking a tab displays the screen for that tab in the Console Center Pane.

Site Pane

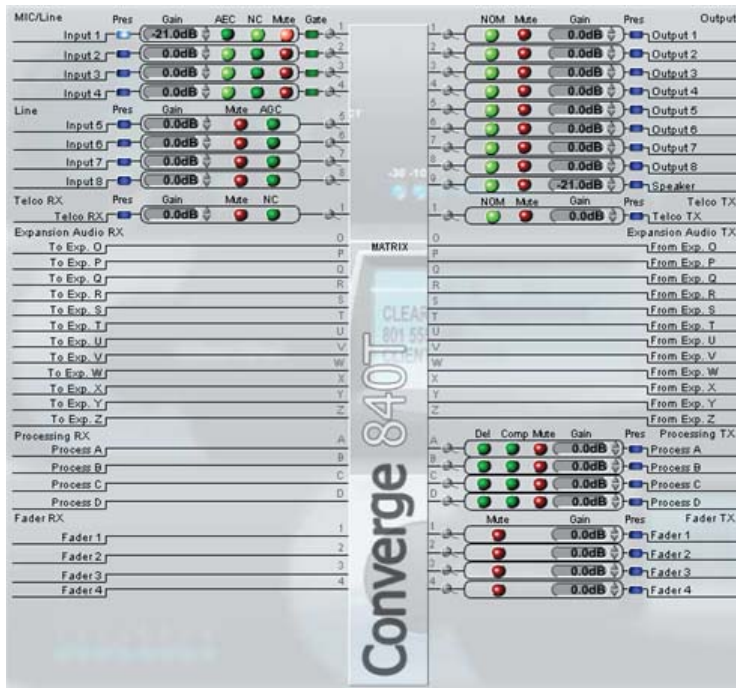


In Configuration Mode, the Site Pane contains the Site Selection drop-down list, Site View tab, and Tree View tab. Right-clicking in either the Site View tab or the Tree View tab brings up a context-sensitive menu with site, unit, channel, and reporting options.



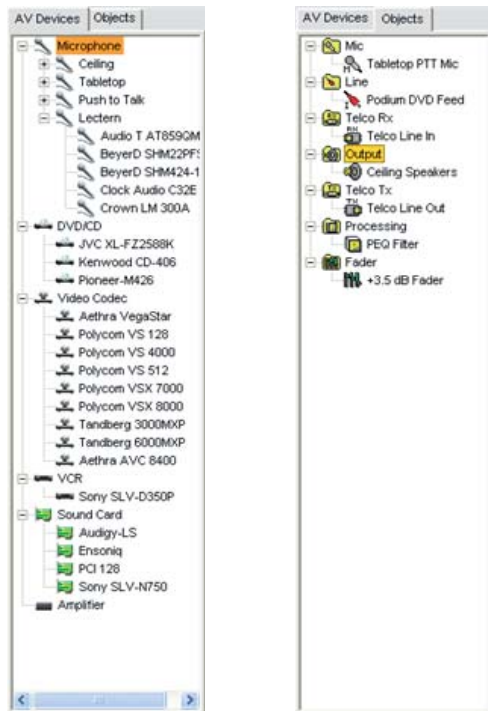
In Preset Mode, the Site Pane displays the Current Site, Current Unit, Preset Selection list, and the Preset Name, Description, and Preset Mask entry fields.

Center Pane



The Center Pane displays the screen for the selected Console Tab. As shown above, the default screen is Unit Tab.

Objects Pane



The Object Pane contains the AV Devices tab, which allows you to select from a list of pre-configured device settings and apply them instantly to a channel; and the Objects tab, which allows you to select from a list of custom channel objects and instantly apply them to a specific channel type. AV Devices and channel Objects are stored in the Database.

Status Bar



The Status Bar displays the current Console Mode, as well as connection status, site information, and unit information.

The LEDs in the Status Bar indicate current status as follows:

- **Clear** (no LEDs illuminated): Not connected
- **Yellow**: Connecting/pending
- **Green**: Connected
- **Red**: Off-line
- **Purple**: Current with error

Console Modes

Console has two modes: Configuration Mode and Preset Mode. Configuration Mode allows you to configure a wide range of advanced settings for your Converge Pro unit. Preset Mode allows you to create presets for specific venues and apply them instantly to your Converge Pro unit.

For additional information, refer to the *Table of Contents* for these related topics:

- **LCD Programming**
- **Site Properties**
- **Configuration Mode Overview**
- **Preset Mode Overview**

SITE FILE OVERVIEW

Site Files allow you to store configuration settings for one or more Converge Pro units, including **Inputs, Outputs, Fader** channels, **Processing** channels, **Matrix** routing, and **Presets**, for a specific application or venue. Site files also provide Console with the necessary information to communicate with the site hardware using your PC.

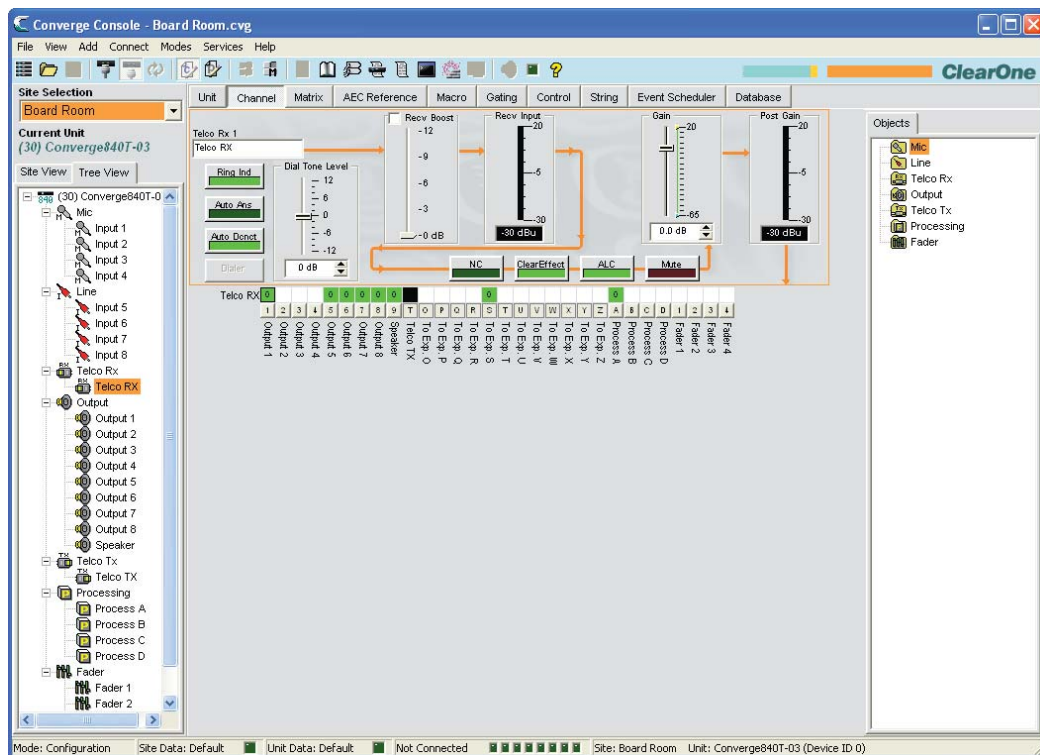
Site files are a powerful tool for creating a library of configuration files for specific applications and room types. For example, you can create a “baseline” Site file for divided rooms that specifies mic gating, output crosspoints, **AEC, AGC/ALC**, etc., store it on your hard drive, and use the file for new, similar installations. This approach allows you to standardize your Converge Pro settings across venues based on your customized room configurations.

NOTE: All Converge Pro units ship with a default site configuration file.

Site files also enable you to create users, set passwords, set unit master/slave control status, set up email notification, and configure time/local parameters as described in **Site Properties**.

Accessing Site Files

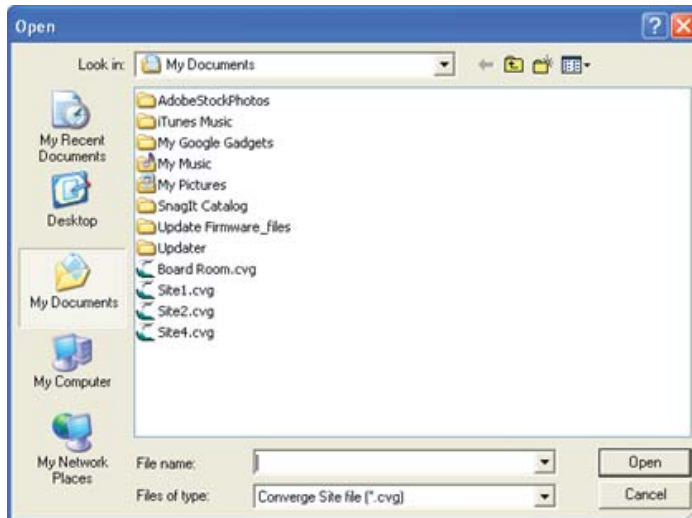
To open a Site file, select the **File** menu in **Console**.



The **File** menu appears. Select **Open Site** as shown below.



The **Open** dialog appears as shown below.




Locate the site file you want to open and click **Open**. Console opens the site file, and it appears in the **Site Selection** drop-down list in the **Site Pane** as shown below. Use the **Files of type** drop-down list to open G-ware files (.PSR file extension) to convert G-ware site files to Converge site files.



The selected site file is now available for use. You can open up to four site files simultaneously and switch between them using the **Site Selection** drop-down list.

Saving Site Files

To save the current Site configuration parameters, including any changes made since the active Site file was opened, click the **Save** button  on the Button Bar, or select **Save or Save As** from the **File** menu.

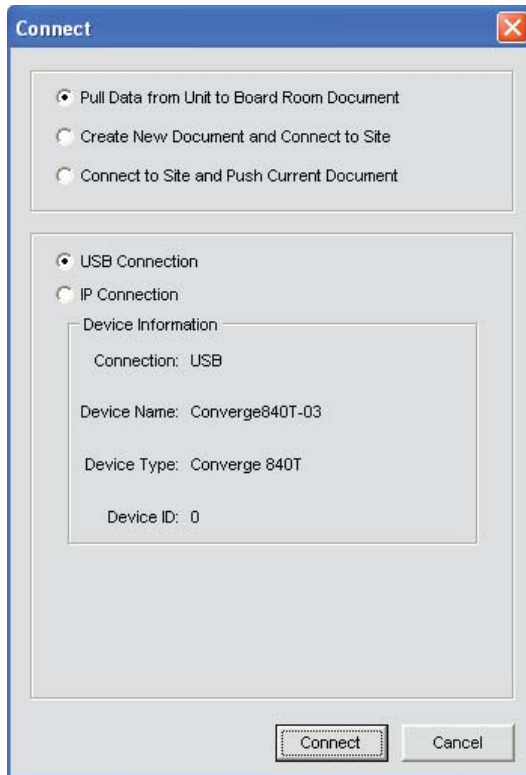
For additional information, refer to the *Table of Contents* for these related topics:

- **Create A Site**
- **Connect to a Site**
- **Site Properties**
- **Console Overview**
- **Configuration Mode Overview**
- **Channel Tab Overview**
- **Matrix Tab**

CONNECT TO A SITE

Connect To a Site

Click the **Connect** button  on the Console **Button Bar**, or select **Connect** from the **Connect Menu**. The **Connect** dialog appears as shown below.




Connection options include:

- To automatically create a new site file, select the **Create New Document and Connect to Site** radio button
- To pull data from the unit to the current Site File, select the **Pull Data from Unit to Current Document** radio button (only available if a site file is open)
- To push data from the current site file to the unit, select the **Connect to Site and Push Document** radio button (only available if a site file is open the unit is added)
- To connect via USB, select the **USB Connection** radio button
- To connect via IP, select the **IP Connection** radio button, and select a unit from the **Available Addresses** drop-down list (or enter an IP address in the **Enter Address** entry box)

Press the **Connect** button to connect to the site or **Cancel** to close the dialog.

NOTE: The default login username is **ClearOne**. The default password is **Converge**. Usernames and passwords are not case sensitive.

Disconnect from a Site

To disconnect from a site, press the **Disconnect** button  on the Console **Button Bar**, or select Disconnect from the **Connect** menu. Answer **Yes** to the **Confirm** dialog that appears, or **No** to cancel.

For additional information, refer to the *Table of Contents* for these related topics:

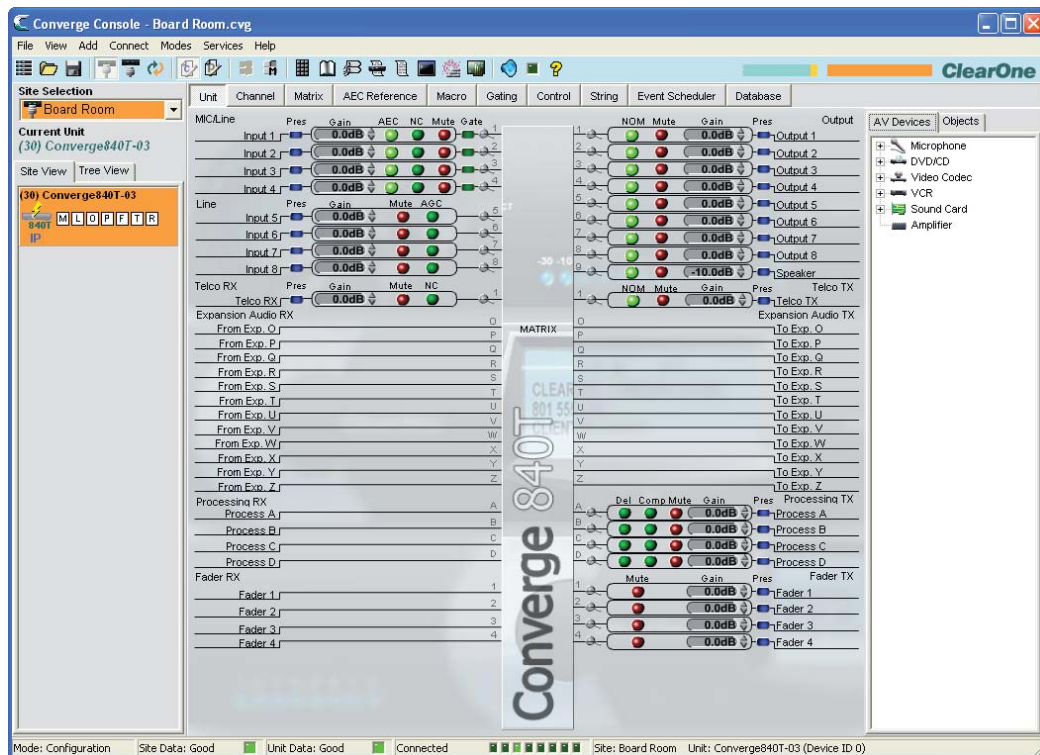
- **Site File Overview**
- **Site Properties**
- **Unit Communication (IP) Settings**

SITE PROPERTIES

Site Files are created and modified using the **Site Properties** window in **Console**. Site files contain all information about a particular installation including properties for all units in a site. For more information, see **Site File Overview**.

Accessing Site Properties

To access the Site Properties window, select the **File** menu in **Console**, or right-click anywhere in the **Site View** or **Tree View** panes and select **Site Properties** from the shortcut menu.



The **File** menu appears. Select **Site Properties** as shown below.



The **Site Properties** window appears with the **General tab** selected.



Create A New Site

To create a new site, select **New Site** from the **File** menu or by clicking the **New Site** button  on the **Console Button Bar**. The **Site Properties** window appears. Site Properties are described in the following sections.

NOTE: You must have administrator privileges to connect to units with Console, and to modify usernames and passwords. Usernames and passwords are not case sensitive.

Site Properties are described in the following sections.

Site Properties: General Tab

The **General** tab of the Site Properties window displays Site file information as shown above. Enter a site name, file

author, and site description in the **Site Info** section of the tab. Press **OK** to save the changes, **Cancel** to close the Site Properties window, or click on the **Management** or **Time/Local** tabs to continue site configuration.

Site Properties: Management Tab

The **Management** tab (shown below) enables you to configure SNMP parameters, email notification settings, as well as usernames and passwords.

The screenshot shows the 'Site Properties - Board Room' dialog box with the 'Management' tab selected. The 'Control Master Unit' dropdown menu is set to '(30) Converge840T-03'. The 'SNMP' section includes fields for 'Manager IP Address' (0.0.0.0), 'Manager Port' (162), 'Write Community' (private), and 'Read Community' (public). The 'Email Notifications' section includes 'SMTP Server IP Address' (0.0.0.0) and 'Email Address' (site_admin@clearone.com). The 'Username/Passwords' section contains three buttons: 'Edit Administrator Username/Password', 'Edit Manager Username/Password', and 'Edit User Username/Password'. The 'OK' and 'Cancel' buttons are at the bottom right.

Control Master Unit

All units in the site appear in the **Control Master Unit** list. Selecting a Control Master Unit designates that unit to control the SNMP interactions for the entire Site across IP-based networks. Control Master Units must be connected to the LAN via IP.

All other units in the Site are Control Slave Units. Control Slave Units report events to the Control Master Unit for SNMP reporting and SMTP email notifications.

Serial Control interactions and **Audio Control** interactions are not affected by a unit's Control Master Unit designation.

NOTE: All Converge Pro units are Control Slave Units by default.

SNMP

In the **SNMP** section, enter the SNMP settings for the site. The Control Master Unit uses this information to communicate SNMP events, including events reported by Control Slave Units.

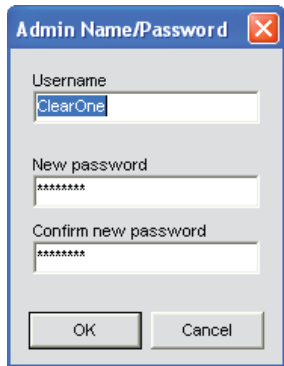
NOTE: SNMP MIB files for each Converge Pro device type are provided on the Converge Pro Installation & Documentation CD for use with SNMP manager software.

Email Notifications

In the **Email Notifications** section, enter the IP address of the server that will receive email notifications in the **SMTP Server IP Address** field, and the desired recipient's email address in the **Email Address** field.

Username/Passwords

In the **Username/Passwords** section, click the button for the user type that you want to create. The **Name/Password** dialog appears as shown below.



The dialog box titled "Admin Name/Password" contains three input fields: "Username" with the text "ClearOne", "New password" with "*****", and "Confirm new password" with "*****". At the bottom are "OK" and "Cancel" buttons.

NOTE: The default username is ClearOne. The default password is Converge. Usernames and passwords are not case sensitive.

User access privilege levels are as follows:

- **Administrator:** Full Console and web portal access.
- **Manager:** Web access to Dialer, Maintenance, Registration, About, and Help pages.
- **User:** Web access to the Dialer, Registration, About, and Help pages.

Enter the appropriate user information and press **OK** to save the user information or **Cancel** to return to the **Site Properties** dialog.

Site Properties: Time/Local Tab

The **Time/Local** tab enables you to configure time settings and specify location information as shown below. As shown below, you can set the date and time manually, synchronize the time with a PC, or use network time servers.



The "Site Properties - Board Room" dialog box has three tabs: "General", "Management", and "Time/Local". The "Time/Local" tab is active. It shows "Current Site Time: Offline" with "Date" (05/10/2007) and "Time" (09:46:07) fields, and a "Use PC clock" checkbox. Below are "Time Server 1" (10.101.24.135) and "Time Server 2" (0.0.0.0) fields. A "Time Zone" dropdown is set to "(GMT-07:00) Mountain Time (US & Canada)" with a "Use Daylight Savings" checkbox checked. The "Location" section includes fields for Building (Headquarters), City (Salt Lake City), State (Utah), Country (USA), Company (ClearOne Communications, Inc.), and Region (North America). "OK" and "Cancel" buttons are at the bottom.

In the **Time** section of the tab, select **Local Time** or **Network Time** for the clock synchronization source.

When **Local Time** is selected, the **Apply** button is activated; pressing it updates the date and time on all units in the current site.

When **Network Time** is selected, you must enter the IP address(es) for the time synchronization server(s). The date and time is updated for all units in the site when you press the **OK** button, and it is automatically synchronized with the specified server(s).

Enter location information in the **Location** section of the tab (optional). Press **OK** to save the site file, or **Cancel** to close the **Site Properties** window.

For additional information, refer to the *Table of Contents* for these related topics:

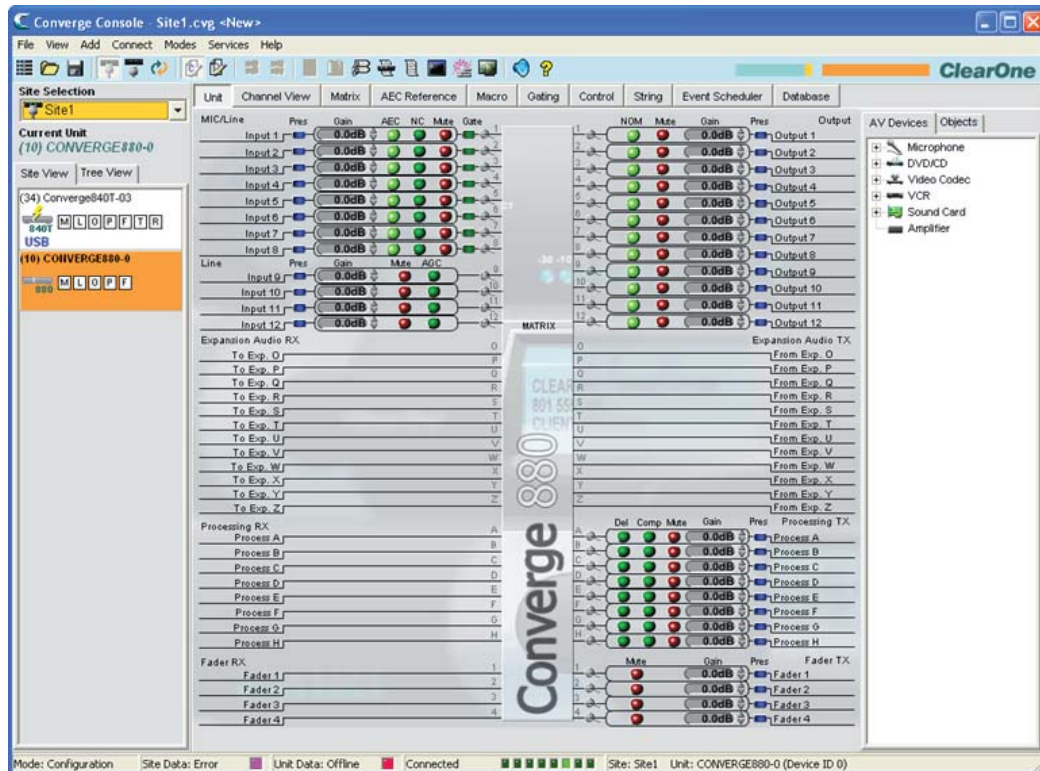
- **Site File Overview**
- **Connect To A Site**
- **Unit Properties**
- **Configuration Mode Overview**

UNIT PROPERTIES

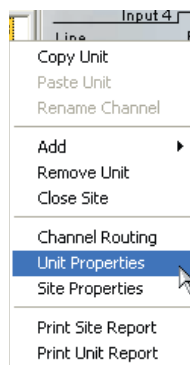
Unit Properties define properties for a specific Converge Pro unit. Unit Properties enable you to configure general unit settings such as name, and telephone country code, as well as IP and serial communication settings. Properties that apply to all units in a site are configured using **Site Properties**.

Accessing Unit Properties

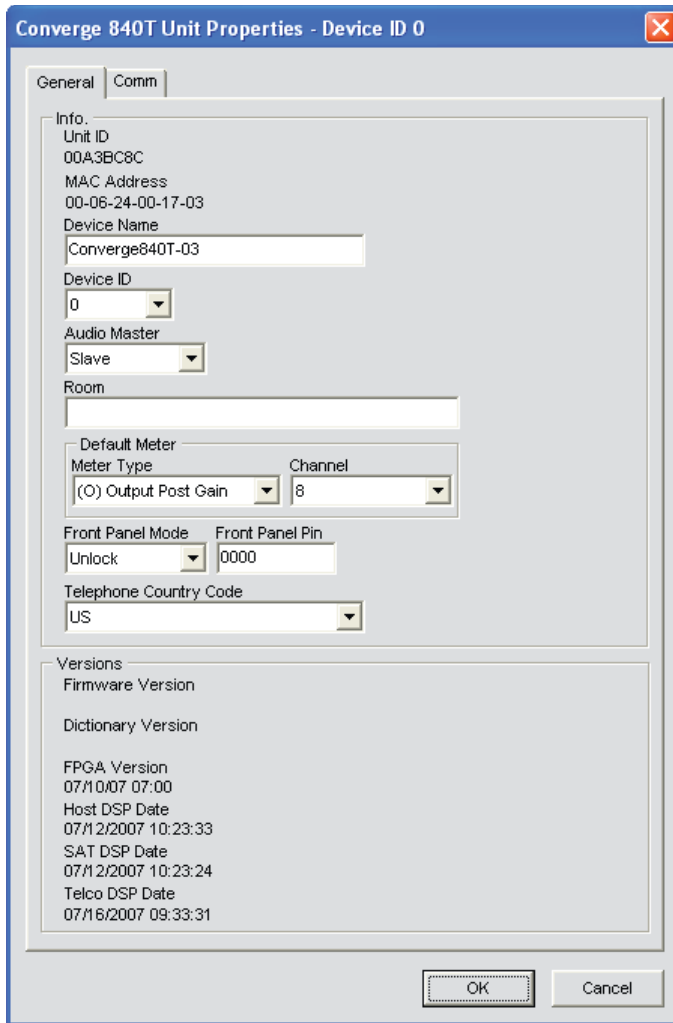
To access the **Unit Properties** window, right click the unit you want to configure in either the **Site View** tab or the **Tree View** tab of the **Site Pane** in **Console**.



The **Site/Unit** menu appears. Select **Unit Properties** as shown below.

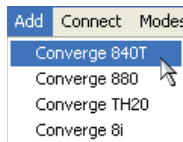


The **Unit Properties** window appears as shown below.



Add A New Unit

To add a unit to a Site, right-click in either the **Site View** tab or the **Tree View** tab of the **Site View** pane, or select the unit type you want to add from the **Add** menu on the Menu Bar as shown below.



The **Unit Properties** window appears. Unit Properties settings are described in the following sections.

Unit Properties: General Tab

The **Unit ID** and **MAC Address** for the selected unit are automatically displayed at the top of the **Info** section of the tab. When connected, the firmware version, dictionary version, and DSP date versions are displayed in the **Versions** section at the bottom of the tab (when connected). You cannot modify this information.

Device Name

Enter a descriptive name in the **Device Name** field. Device names are used as network identifier on NetBIOS networks. They must start with a letter and can contain both letters and numbers, with a maximum length of 15 characters. No special characters are allowed except for “-”.

Device ID


Select a Device ID from the **Device ID** drop-down list.

Device IDs ensure that the Console software synchronizes with the proper unit when there are multiple Converge Pro units of the same type in a site. Therefore, each Converge Pro unit of the same type in a Site must have a unique Device ID assigned using the front panel LCD Settings Menu. All Converge Pro units ship from the factory with a default DID of 0.

Converge Pro Device Types and Device IDs by model are as follows:

Model	Device Type	Device ID
880	1	0-7
TH20	2	0-F
840T	3	0-7
8i	A	0-7

For example, if there are two Converge Pro 880s and one 840T in a site, the 880s must have unique DIDs. They could be assigned DIDs of 0 and 1 respectively, and the 840T could be assigned a DID of 0.

NOTE: You must disconnect from the site in order to set the Device ID. Press the **Disconnect**  button on the **Button Bar**.

NOTE: The DID specified in Console **MUST** match the DID set for that unit in the LCD Settings Menu. Otherwise when you reconnect to the site, Console will correctly recognize the unit with the correct DID, but it also adds a duplicate unit with the incorrect DID.

Audio Master

Select **Slave** (default) or **Master** from the **Audio Master** drop down list. Audio Master units ignore audio from upstream units in a site as shown below.



This prevents audio from being received from units above the master unit in a Site. For example, you can configure a Site with multiple Converge Pro units for a room-combining application where all units act together when three smaller rooms are combined together into a single larger room. When the rooms are divided again, the audio from one room will not be available in the other two rooms due to the Audio Master configuration.

In graphic above, the third unit in the network is an Audio Master with an RS-232 control device attached. Audio

from the first and second units in the network does not pass beyond the second unit. Likewise the second Audio Master unit in the network does not pass audio from the unit before it. Sites can use multiple RS-232 devices, which you can connect to any unit regardless of Control Slave or Master designations.

However serial control is not affected by Audio Master or Slave designations. Global serial control of the site is maintained by the Converge Pro unit connected to a control device through its RS-232 port, in this case the third unit in the network which is also designated as the first Audio Master in the network.

NOTE: A master unit is not required for Converge Pro sites, and in most installations, all units will be slaves. Also, SNMP Control is not affected by Audio Master designations.

For information about the **Link In** and **Link Out** connections used to build Converge Pro sites, see *Controls & Connections*.

Room

Enter a descriptive name for the room in the **Room** field.

Default Meter & Channel

Select an input, output, or processing channel to be the **Default Meter** on the front panel LED Meter when a channel is not specifically selected.

Front Panel Mode & PIN (Front Panel Lock/Unlock)

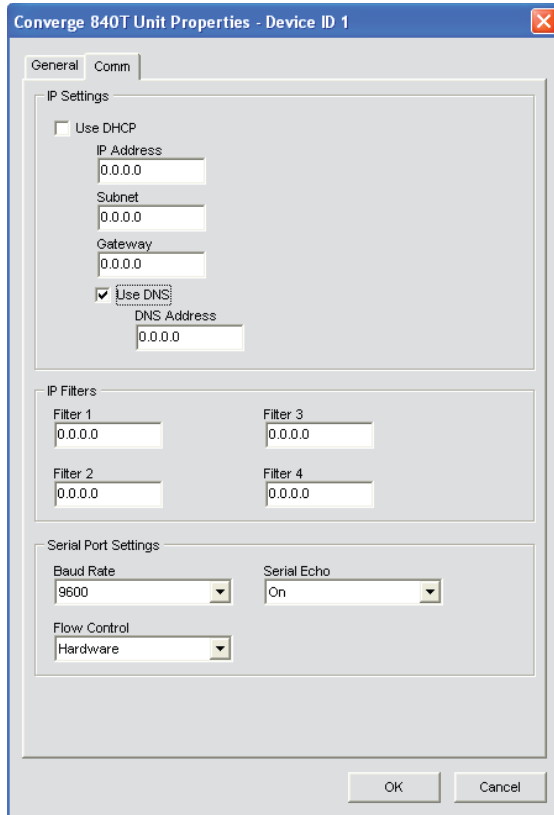
Select **Lock** in the **Front Panel Mode** field to lock the front panel LCD of the unit and require a PIN code to unlock it. Enter the unlock code in the **Front Panel Pin** field. Select **Unlock** in the **Front Panel Mode** field to leave the front panel LCD unlocked.

Telephone Country Code

Select the appropriate Telephone **Country Code** for your installation (840T and TH20 models only).

Unit Properties: Comm (Communications) Tab

The Comm tab contains IP protocol selection and address settings, as well as serial port configuration settings as shown below.



IP Settings

If you want to use DHCP (Dynamic Host Configuration Protocol), select the **DHCP** checkbox. (Selecting DHCP disables the remaining IP settings.) Otherwise, enter the **IP Address**, **Subnet**, and **Gateway** information, and **DNS** (Domain Name Server) addresses for your installation. The default is Use DHCP.

IP Filters

Use IP Filters to enter specific IP addresses that will be allowed to connect to the selected unit. You can specify a range of IP addresses by using zeros. For example, entering 192.168.105.0 will allow any IP addresses in the 192.168.105.1 to 192.168.105.254 range to access the unit.

Serial Port Settings

Select the **Serial Port** settings (**Baud Rate** and **Flow Control**) that are appropriate for your installation. **Serial Echo** enables and disables echo on the serial port. The default for Baud Rate is 57600. The default for Flow Control is Hardware. The default for Serial Echo is On.

When you are finished configuring unit properties, click **OK** to save the changes, or **Cancel** to close the **Unit Properties** window.

For additional information, refer to the *Table of Contents* for these related topics:

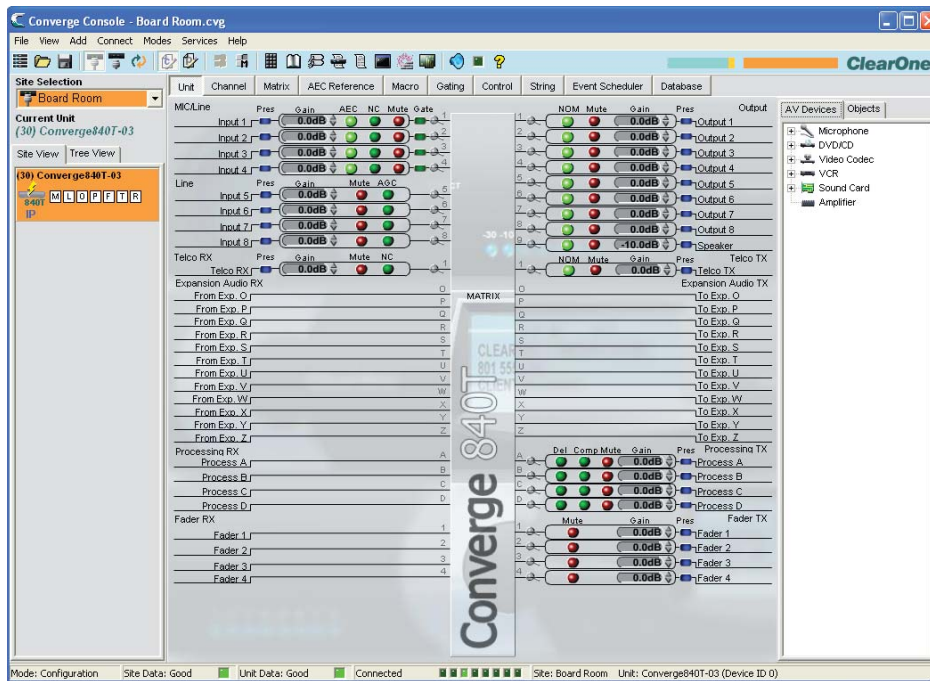
- **LCD Programming Overview**
- **LCD Settings Menu**
- **Site File Overview**
- **Site Properties**
- **Connect To A Site**
- **Preset Mode Overview**
- **Controls & Connections**
- **Serial Control**
- **SNMP Control**

CONFIGURATION MODE OVERVIEW

Converge Console has two modes: **Configuration Mode** (default) and **Preset Mode**. Configuration Mode enables you to perform advanced configuration of Converge Pro **Sites** and **Units** and customize them to your specific application.

Accessing Configuration Mode

Console automatically starts in Configuration Mode with the Unit tab displayed as shown below.



You can switch between modes by clicking on the **Mode**  buttons on the **Button Bar**. For a description of the components of the Console screen in Configuration Mode, see **Navigating Converge Console**.

Configuration Mode Tabs

Console has ten tabs on the Tab Bar that provide specific configuration options while in Configuration Mode:

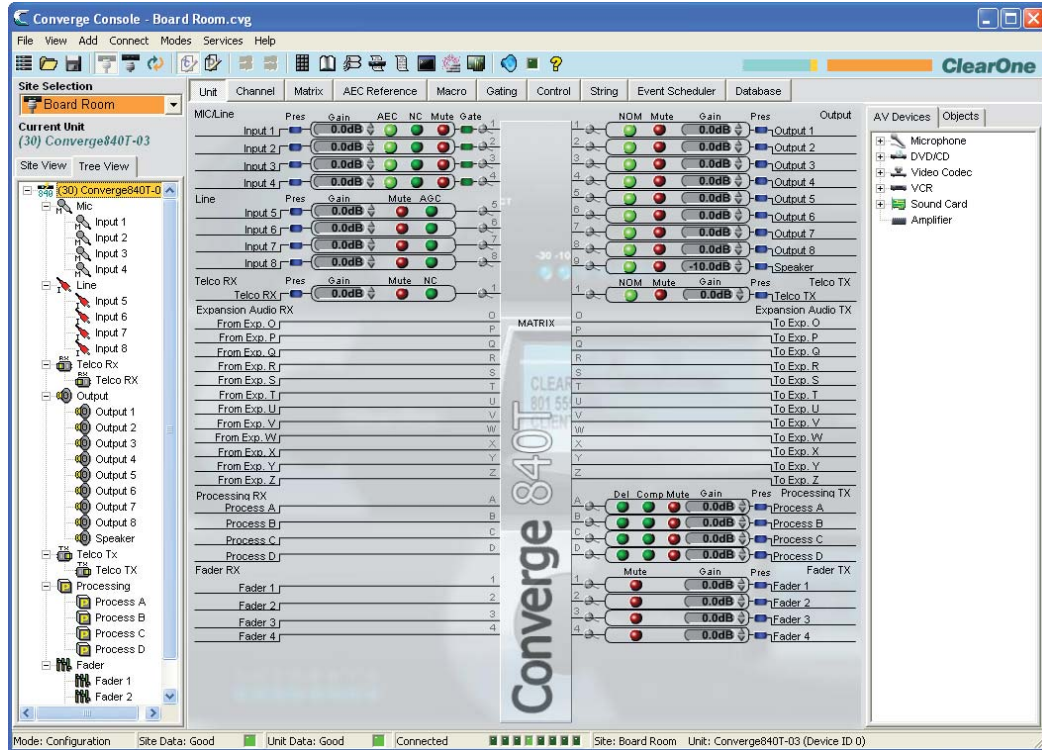
- **Unit**
- **Channel**
- **Matrix**
- **AEC Reference**
- **Macro**
- **Gating**
- **Control**
- **String**
- **Event Scheduler**
- **Database**

UNIT TAB

The **Unit Tab** shows a detailed block diagram for the Converge Pro unit selected in the site pane. The diagram shows the path of the audio signal, based on the current unit configuration, and provides a graphical explanation of each stage of audio processing.

Accessing the Unit Tab

Console automatically starts in Configuration Mode. When you load a site file, Console displays the Unit tab by default as shown below. To switch to the Unit tab from any other tab, click the **Unit** tab on the **Tab Bar**.



NOTE: The **Unit** tab shown above is for an 840T with the **Tree View** tab selected in the **Site Pane**. All Converge Pro units that are connected and belong to the site will also appear in the Tree View tab. The Unit tab display for other Converge Pro unit types will vary from that shown, depending on the number of inputs, outputs, telco connections, etc. for that model.

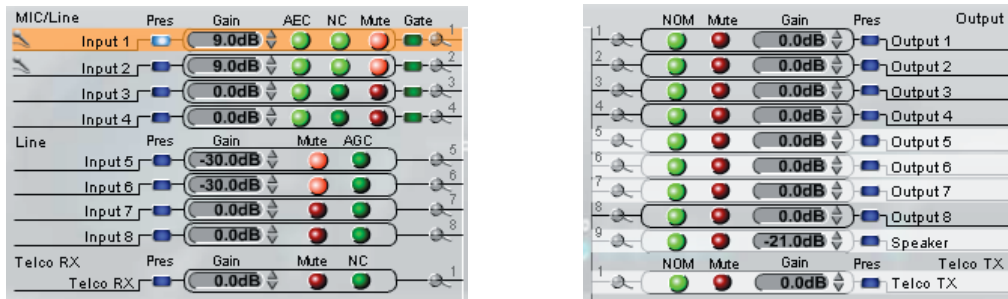
Unit Tab Functionality

The graphical elements shown in the block diagram of the Unit tab provide shortcuts to the basic configuration settings for each channel type. For full configuration control of a channel, use the Channel tab.

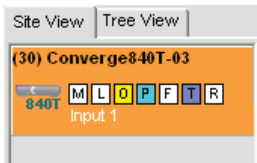
For all channels in the Unit tab display, the blue Pres (Audio Presence) LEDs illuminate to indicate the presence of audio on the channel. For Mic Input Channels, the green Gate LEDs illuminate to indicate that the Mic is gated on.

The following sections describe the configuration setting shortcuts available in the Unit tab.

Input Channel Settings



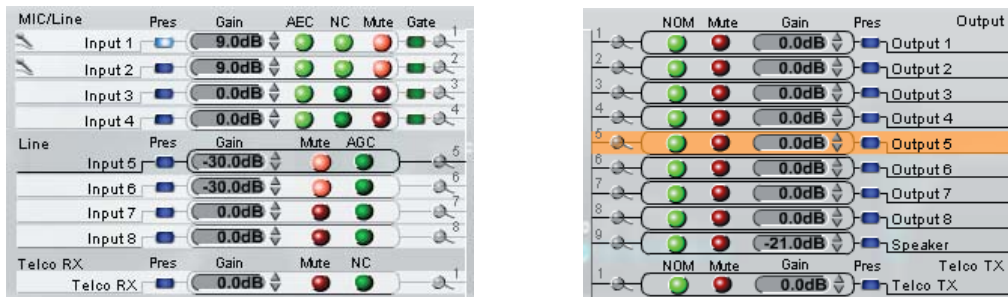
Pointing to an input channel on the left side of the screen highlights it in orange, and shows the routing for the channel in white on the right side of the screen (shown above). Clicking the channel selects it and displays the routing to other units in the site by channel type in the site pane (shown below).



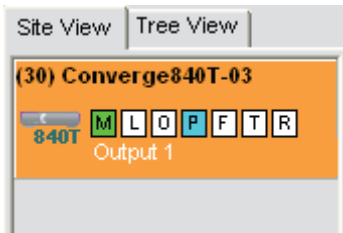
Set the desired Gain settings for the Input channel using the **Gain Arrows** to the right of the **Gain Display**. Toggle **AEC (Acoustic Echo Cancellation)**, **NC (Noise Cancellation)**, and **Mute** on and off by clicking the associated **LED Buttons**.

To access the full set of configuration settings for the channel, click on the **Magnifying Glass** icon located next to the channel.

Output Channel Settings



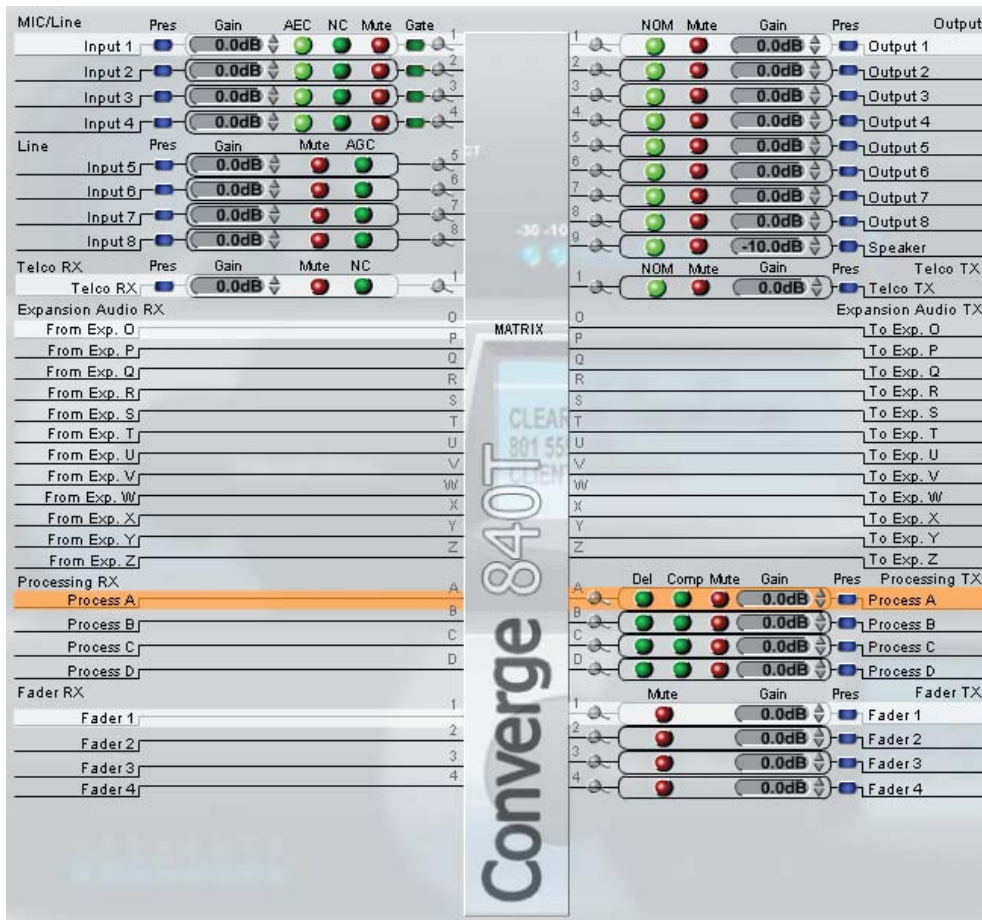
Pointing to an output channel on the right side of the screen highlights it in orange, and shows the routing for the channel in white on the left side of the screen (shown above). Clicking the channel selects it and displays the routing to other units in the site by channel type in the Site Pane (shown below).



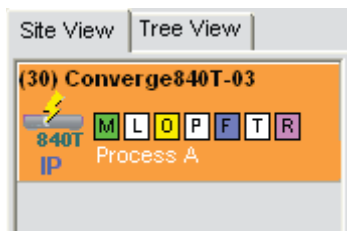
Set the desired Gain settings for the output channel using the **Gain Arrows** to the right of the **Gain Display**. Toggle **NOM (Number of Open Mics/Constant Level)**, and **Mute** on and off by clicking the associated **LED Buttons**.

To access the full set of configuration settings for the channel, click on the **Magnifying Glass** icon located next to the channel.

Processing Channel Settings



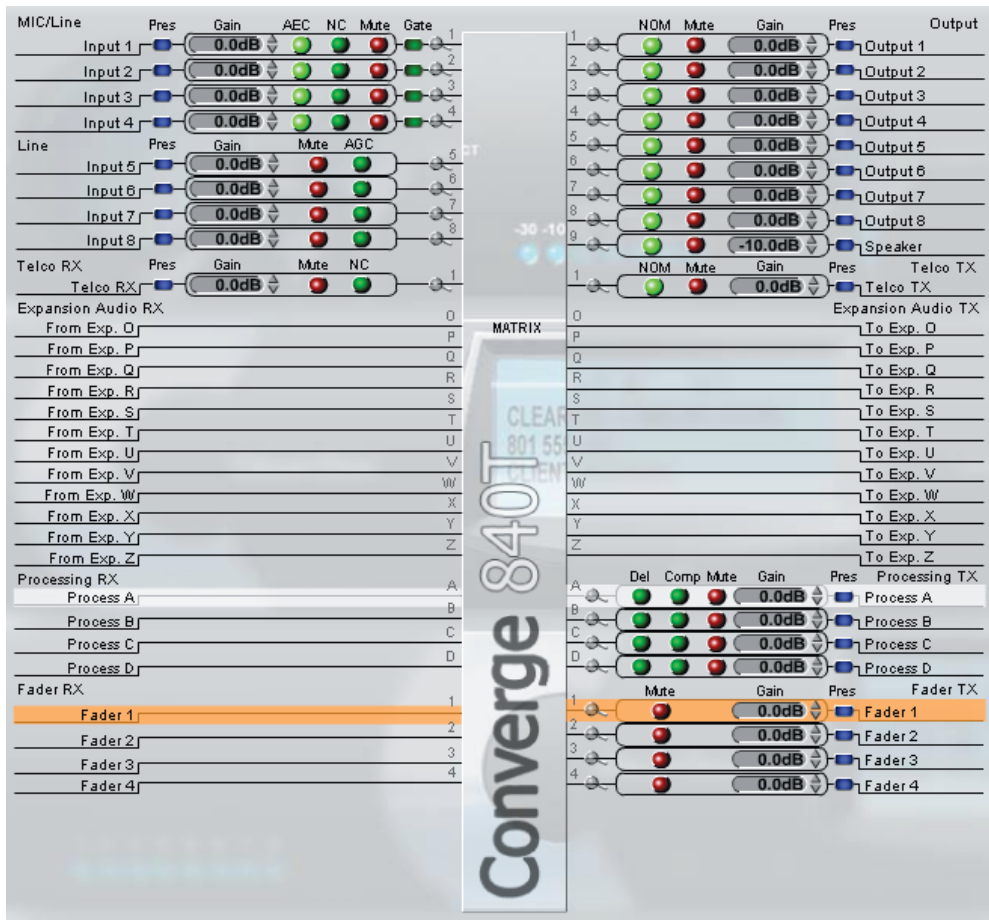
Pointing to a processing channel in the Matrix section of the screen highlights it in orange, and shows the routing for the channel in white (shown above). Clicking the channel selects it and displays the routing to other units in the site by channel type in the Site Pane (shown below).



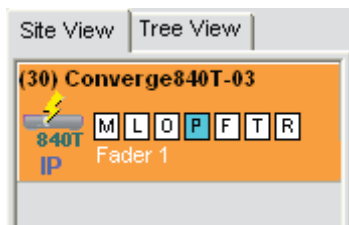
Set the desired Gain settings for the processing channel using the **Gain Arrows** to the right of the **Gain Display**. Toggle **Del (Delay)**, **Comp (Compression)**, and **Mute** on and off by clicking the associated **LED Buttons**.

To access the full set of configuration settings for the channel, click on the **Magnifying Glass** icon located next to the channel.

Fader Channel Settings



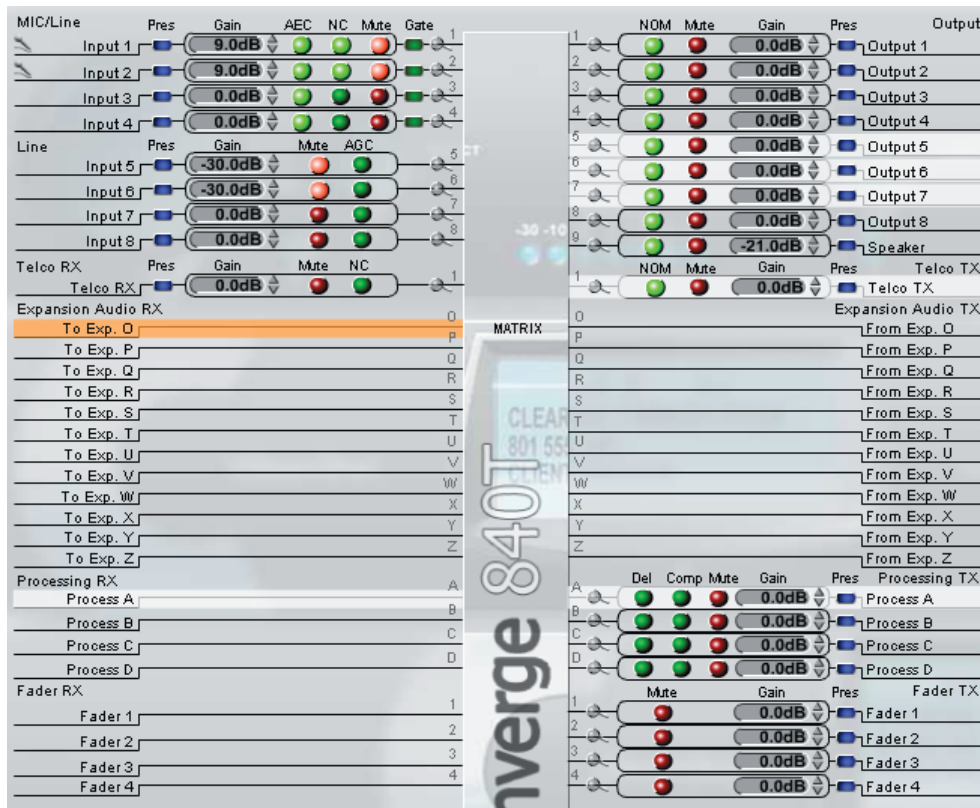
Pointing to a fader channel in the Matrix section of the screen highlights it in orange, and shows the routing for the channel in white (shown above). Clicking the channel selects it and displays the routing to other units in the site by channel type in the Site Pane (shown below).



Set the desired Gain settings for the fader channel using the **Gain Arrows** to the right of the **Gain Display**. Toggle **Mute** on and off by clicking the associated **Mute LED Button**.

To access the full set of configuration settings for the channel, click on the **Magnifying Glass** icon located next to the channel.

Expansion Audio RX and TX



Pointing to an Expansion RX or TX channel in the **Matrix** section of the screen highlights it in orange. Clicking the channel selects it and shows the **Input** (TX channels only), **Output** (RX channels only), **Processing**, **Expansion**, and **Fader** channel routing (white highlights) for the selected channel as shown above.

For more information, refer to the *Table of Contents* for these related topics:

- **AEC (Auto Echo Cancellation)**
- **NC (Noise Cancellation)**
- **Configuration Mode**
- **Channel Tab**
- **Matrix Tab**
- **Processing Settings**
- **Fader Settings**

CHANNEL TAB OVERVIEW

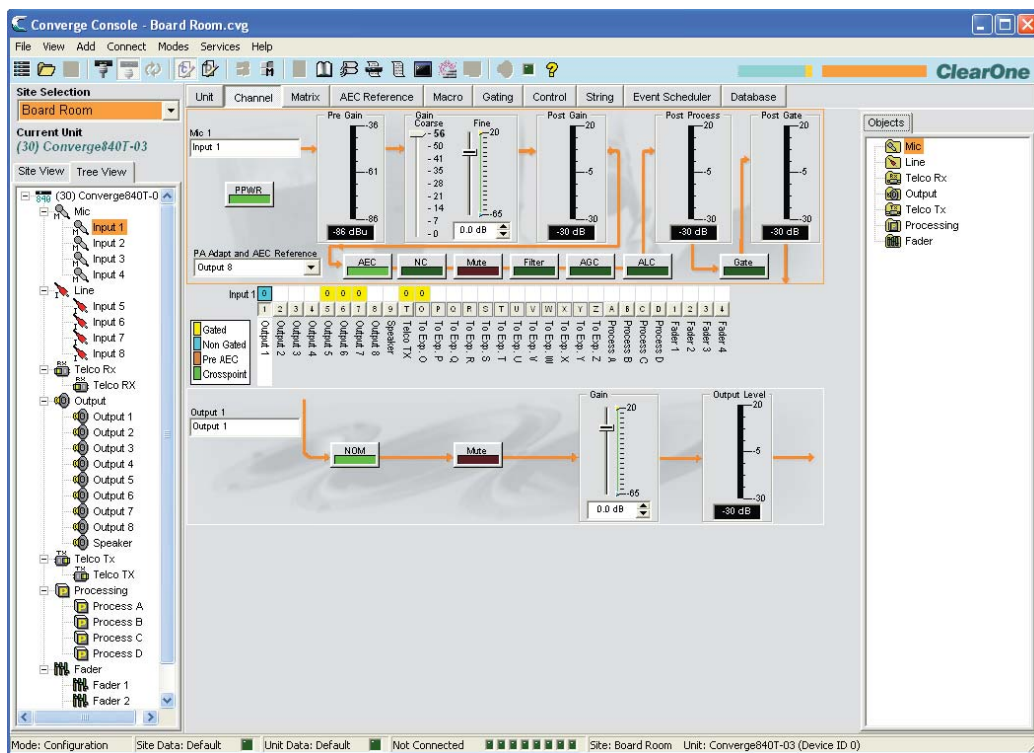
The **Channel** section of the interface provides complete configuration of all functionality related to a given channel, from input to processing to output. The type of channel selected in the **Tree View** tab of the **Current Unit** pane determines the contents of the **Channel** pane in the center of the Console.

The channels available in the **Tree View** tab are:

- **Mic Input Channels**
- **Line Input Channels**
- **Telco Rx Channel (840T and TH20 only)**
- **Output Channels**
- **Telco Tx Channel (840T and TH20 only)**
- **Processing Channels**
- **Fader Channels**

Accessing Channel Tab

Selecting a channel in the **Tree View** tab displays the **Channel Tab** for that channel. For example, the channel tab for a **Mic Input** channel is shown below:

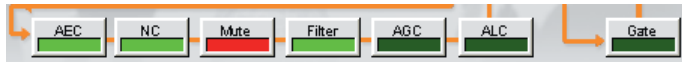


Channel Configuration Controls

As shown above, the configuration settings for a channel are displayed as controls (buttons, sliders, check-boxes, selection lists, text entry boxes) in the **Channel** pane. Use the text entry boxes to assign custom names. Use the drop-down lists to select from a list of configuration values. Use the sliders to set a discrete value for channel configuration parameters.

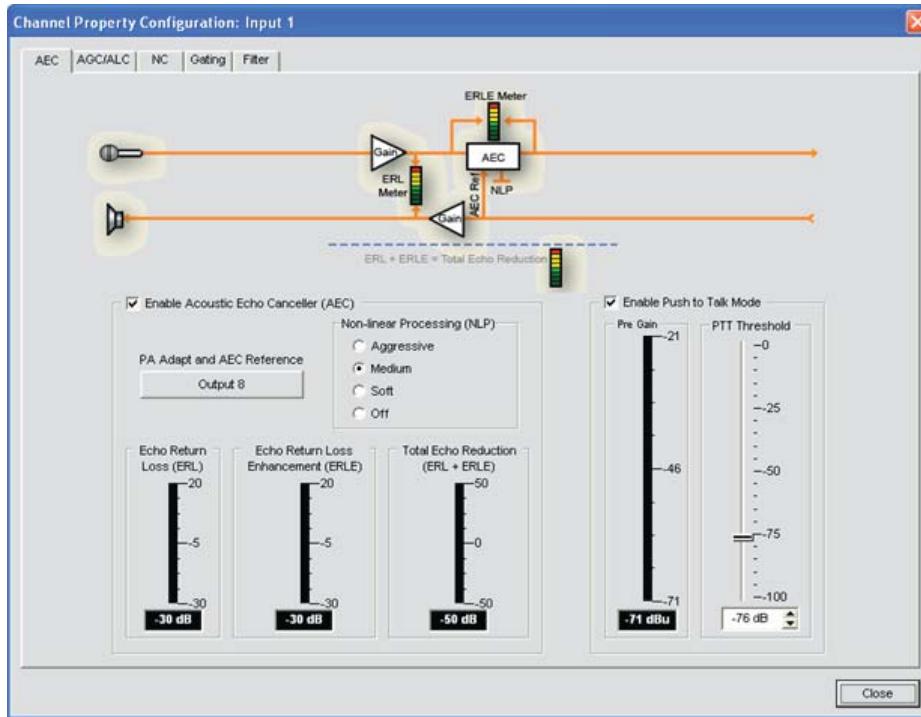


Some buttons, such as the **Mute** and **PPWR** (Phantom Power) shown above, toggle features on and off.



Other buttons as shown above, including **AEC (Automatic Echo Cancellation)**, **NC (Noise Cancellation)**, **Filter**, **AGC (Automatic Gain Control)**, **ALC (Automatic Level Control)**, bring up the **Channel Property Configuration** screen shown below.

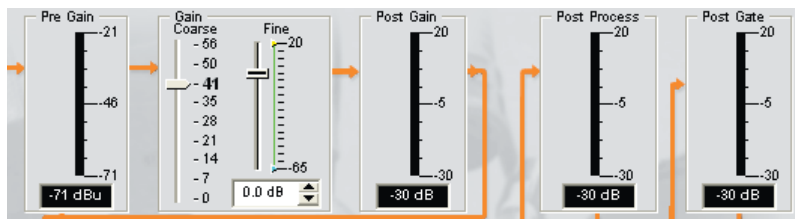
Channel Property Configuration Screen



The **Channel Property Configuration** screen is used to configure **Mic Input**, **Line Input**, and **Processing channels**. The tabs available in this screen change depending on the type of channel selected in the **Tree View** pane of Console.

Meters

In addition to the configuration controls available in the **Channel** pane, there are meters showing signal levels in real-time at each stage of signal processing. The meters shown change with the type of channel selected. For example, the meters for Mic Input channels are shown below:



NOTE: All meters in Console are peak-level meters.

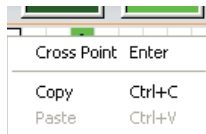
Channel Routing Matrix

The channel routing matrix of the **Channel** pane shows the associated **Matrix** row and routing configuration for the channel selected in the **Tree View** tab of the **Current Unit** pane. The channel routing matrix of the **Channel** pane for a Mic Input channel is shown below.

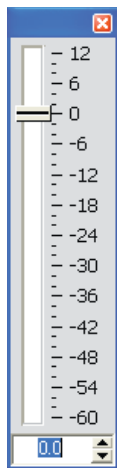
Input 1	1	2	3	4	5	6	7	8	9	T	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	1	2	3	4	
Gated					0	0	0			0	0																				
Non Gated																															
Pre AEC																															
Crosspoint																															

Use the routing legend to determine the current cross-point configuration of the selected input channel. As shown in the example above, **Input 1** is non-gated and cross pointed by default to **Output 1**. It is also gated and cross pointed by default to **Outputs 5-7, Telco TX, and Exp Bus O**.

Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a colored box. The dB level for set cross points is shown numerically in the box. To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu as shown below.



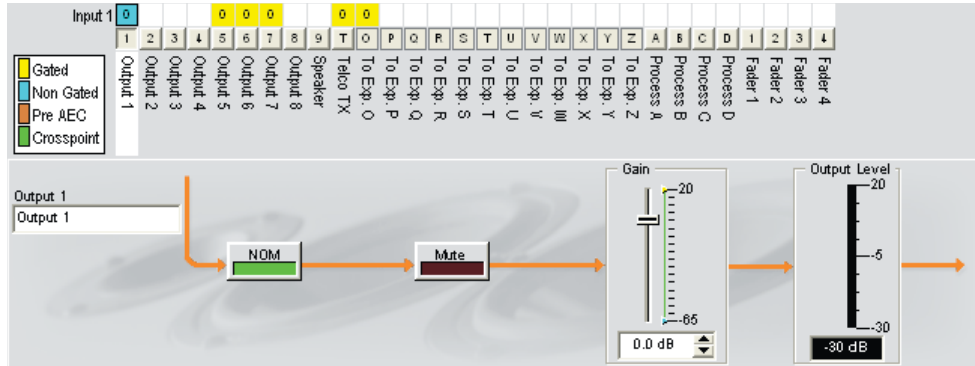
The **Cross Point Attenuation** slider appears as shown below. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to +12dB in .5dB increments. The default is 0dB.



NOTE: Changes are automatically saved when you close the slider.



In the channel route matrix section of the **Channel** pane, pressing the channel button underneath an **Output, Process, or Fader** cross point box (shown above) displays the signal flow diagram and configuration controls for that channel (shown below).



This display is identical to that shown on the Channel Tab when the channel is selected in the **Tree View** pane.

NOTE: Changes to channel configuration settings made in the channel routing matrix apply globally to the channel. For example, changing the label (name) from “**Output 1**” to “**Ceiling Speakers**” changes the name of the output channel in the Tree View pane, and everywhere else the label appears in Console.

For additional information, refer to the *Table of Contents* for these related topics:

- **Mic Input Channels**
- **Line Input Channels**
- **Telco Rx Channel (840T and TH20 only)**
- **Output Channels**
- **Telco Tx Channel (840T and TH20 only)**
- **Processing Channels**
- **Fader Channels**
- **AEC (Automatic Echo Cancellation)**
- **NC (Noise Cancellation), Filter**
- **AGC (Automatic Gain Control)**
- **ALC (Automatic Level Control)**
- **Mic Gating**
- **Filters**
- **Site Pane**
- **Objects Pane**

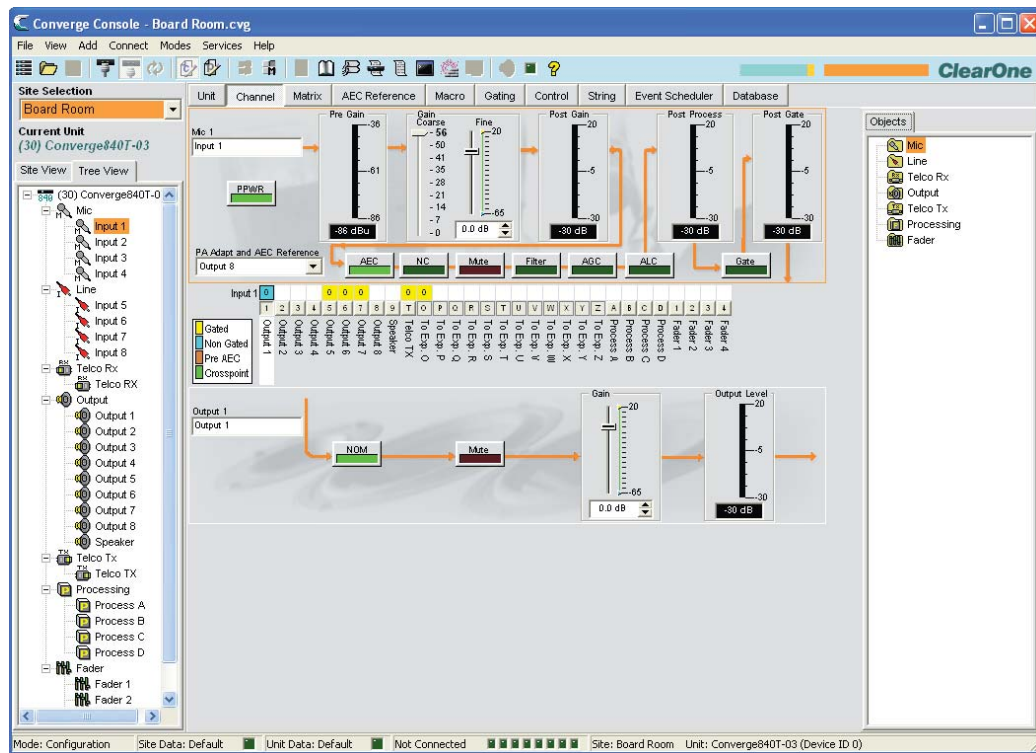
AEC (ACOUSTIC ECHO CANCELLATION)

AEC (Acoustic Echo Cancellation) is a process in which acoustical echo is removed from an input signal, thereby improving audio clarity.

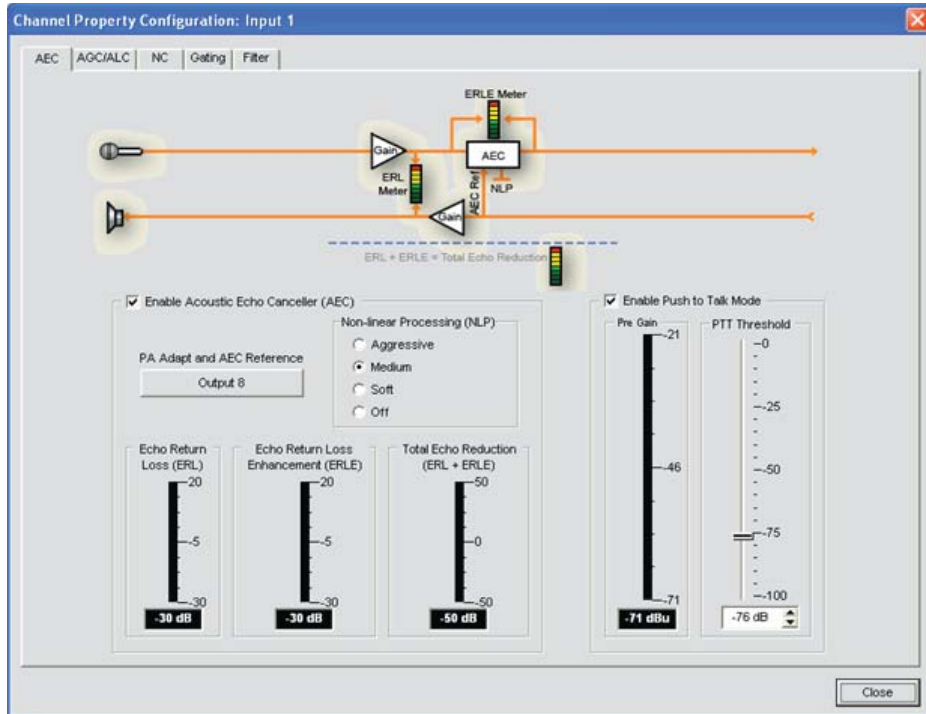
AEC uses a reference source to perform AEC based on the acoustic characteristics and dynamics of a specific application (room). Use the **AEC Reference Tab** to set up these references.

Accessing AEC

With the **Channel** tab selected on the **Tab Bar**, select the desired **Mic input** channel on the **Tree View** tab in the **Site Pane**, and press the **AEC** button (located just below the **Pre Gain** meter).



The **Channel Property Configuration** screen appears with the **AEC** tab selected (see below).



The AEC tab shows a signal flow diagram for AEC, and has the following features: **Enable AEC, PA Adapt and AEC Reference, NLP (Non-linear Processing), and PTT (Push-to-Talk) Mode**. These features are described in the following sections.

Enable AEC Checkbox

Select the checkbox to enable AEC.

PA Adapt and AEC Reference Button

This button displays the expansion bus output channel currently used as the AEC reference for the selected Input channel. Clicking the button closes the **Channel Property Configuration** window and opens the **AEC Reference Tab** in the **Center Pane** of Console.

NLP (Non-Linear Processing) Radio Buttons

NLP increases the power of echo cancellation for difficult acoustical environments. NLP features four settings: **Soft (6dB), Medium (12dB), Aggressive (18dB), Off**. The default is soft.

NOTE: Use NLP with care. There are corresponding trade-offs associated with NLP, including suppression and half-duplex operation.

The **AEC** tab also includes meters for **Echo Return Loss (ERL), Echo Return Loss Enhancement (ERLE), and Total Echo Reduction (ERL + ERLE)**.

ERL (Echo Return Loss) Meter

Shows the coupling between the reference signal and the input to the echo canceller—the difference of the two levels. This is an average meter that updates when a receive-only signal is present.

ERLE (Echo Return Loss Enhancement) Meter

Shows the loss through the echo cancellation and non-linear processing chain—the difference of the two levels. This is an average meter that updates when a receive-only signal is present.

ERL + ERLE Meter

Shows the total **ERL and ERLE** reduction. This is an average meter that updates only when a receive -only signal is present.

PTT (Push to Talk) Mode

Select the **Enable Push to Talk Mode** checkbox to enable PTT. PTT notifies AEC when a microphone is switched off, and freezes AEC convergence until the microphone is switched back on. As a result, PTT helps prevent AEC divergence and improves overall AEC performance with push to talk microphones.

When the microphone is off, set the **PTT Threshold** slider to the level of the **Pre-Gain Meter** for the channel.

For additional information, refer to the *Table of Contents* for these related topics:

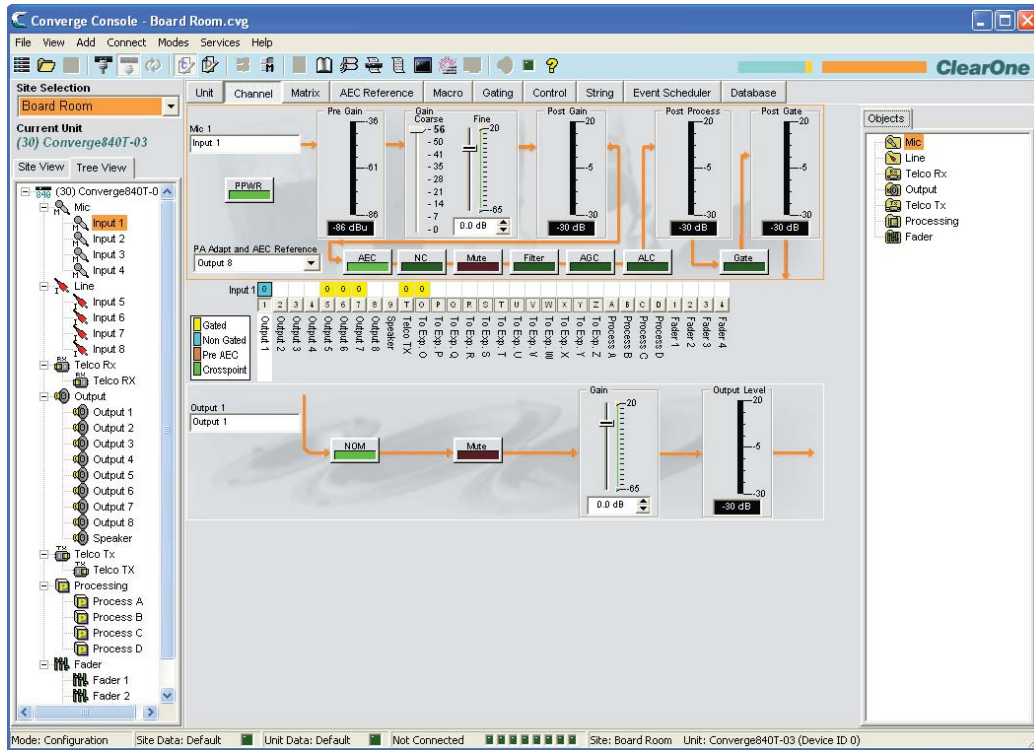
- **AEC Reference Tab**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **NC (Noise Cancellation)**
- **Mic Gating**
- **Filters**
- **Line Input Settings**
- **Mic Input Settings**

NC (NOISE CANCELLATION)

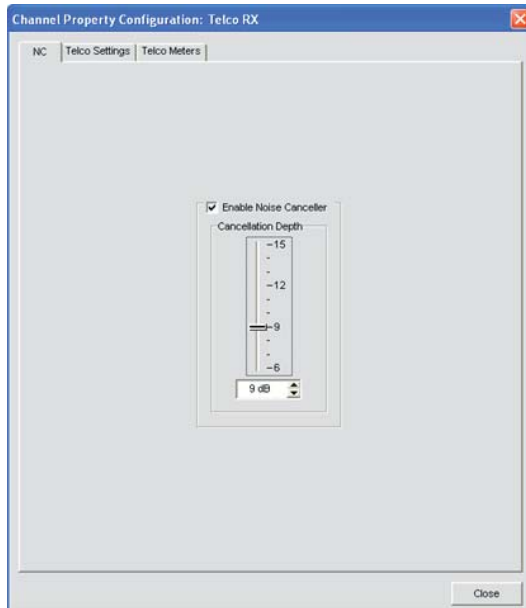
NC (Noise Cancellation) is a process in which ambient (background) noise is removed from an input signal, with no noticeable degradation in signal quality. NC is available on Mic Input and Telco Rx channels only.

Accessing NC

With the **Channel** tab selected in the **Center Pane**, select the desired Mic Input channel on the **Tree View** tab in the **Site Pane**, and press the **NC** button (located just below the **Coarse Gain** slider).



The **Channel Property Configuration** screen appears with the **NC** tab selected as shown below.



Configuring Noise Cancellation

Select the **Enable Noise Canceller** checkbox to enable NC for the channel. Adjust the **Cancellation Depth** slider to the dB setting which provides the best combination of low noise and maximum speech clarity. The cancellation depth can also be set using the arrow buttons or by entering a value directly in the field. The attenuation depth can be set in 1dB increments from 6dB to 15dB. The default is 6dB. The default NC is Off.

For additional information, refer to the *Table of Contents* for these related topics:

- **Channel Tab Overview**
- **AEC (Acoustic Echo Cancellation)**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **Mic Gating**
- **Filters**
- **Mic Input Settings**
- **Telco RX Settings (840T and TH20)**

FILTERS

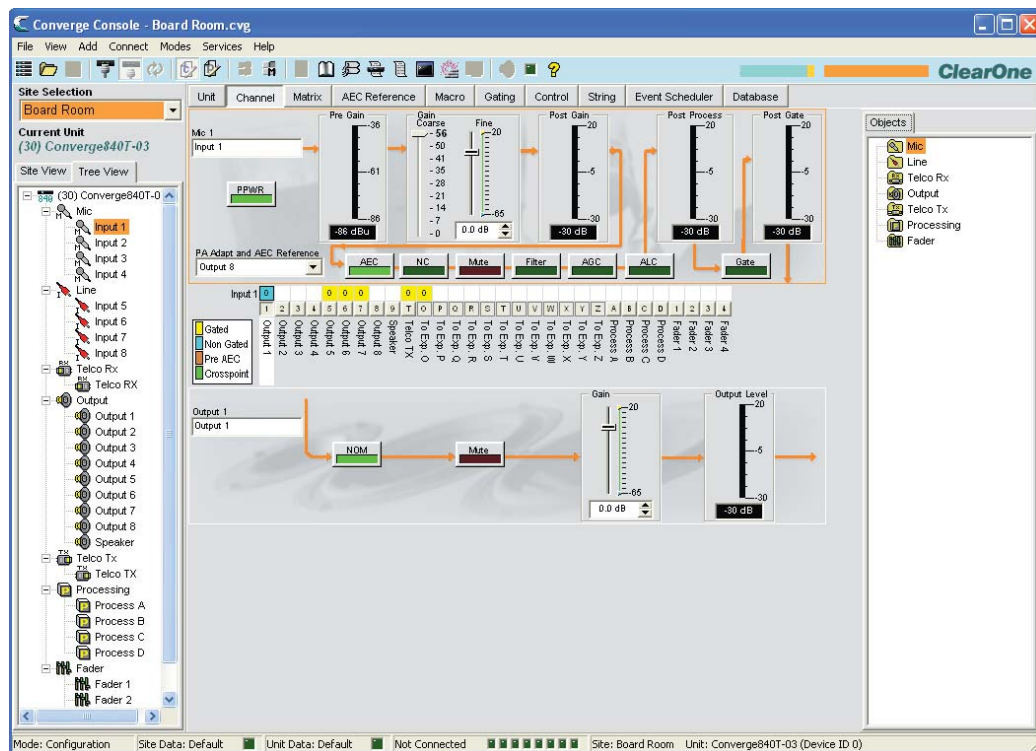
Filters enable you to shape the audio signals from **Mic Inputs** for improved audio quality.

There are four configurable filter types available for mic input channels:

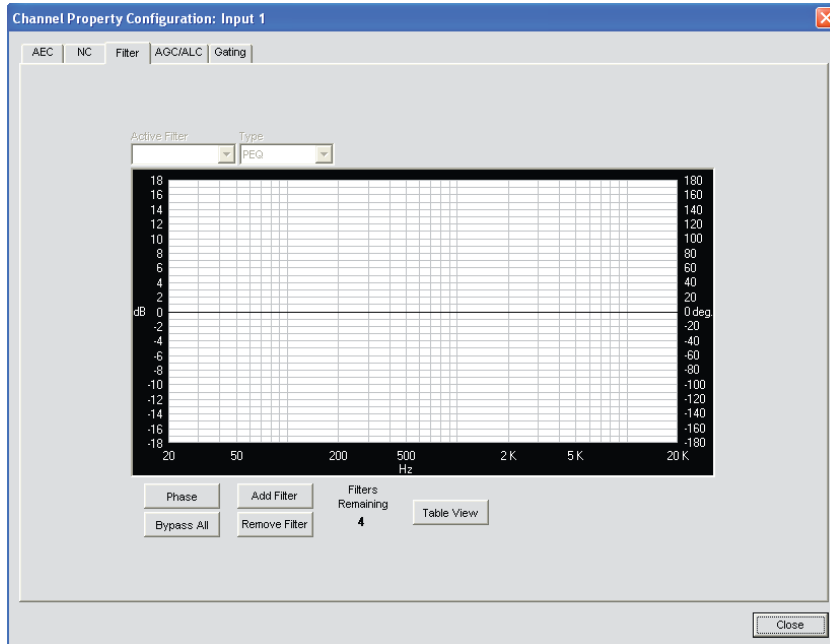
- All Pass
- High Pass
- Low Pass
- Notch
- PEQ (Parametric Equalizer)

Accessing Filters

With the **Channel** tab selected on the **Tab Bar**, select the desired input channel on the **Tree View** tab in the **Site Pane**, and press the **Filter** button (located just below the **Post Gain** meter).



The **Channel Property Configuration** screen appears with the **Filter** tab selected as shown below.

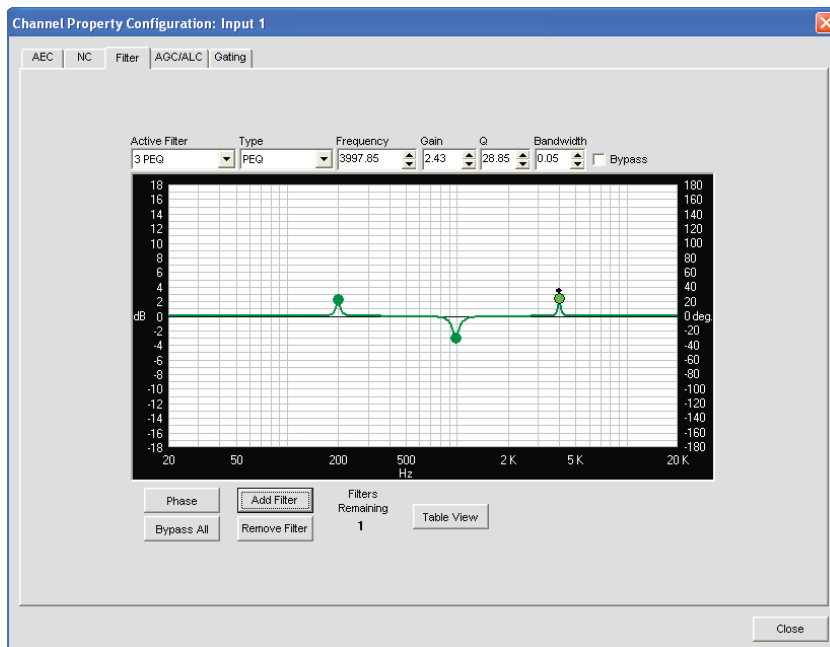


The following sections describe how to configure and activate input channel filters.

Active Filter

Use the **Active Filter** drop-down list to select among active filters. Selecting a filter highlights its node on the graph and displays its current settings. You can configure up to four active filters per input channel.

NOTE: There are no filters configured by default. Press the **Add Filter** button to create a filter for the input channel. When you add a filter, it appears in the **Active Filter** drop-down list, and on the active filter graph.



In graph view, you can click on a filter node and drag it to the desired location on the graph. The setting fields immediately reflect changes made by dragging filter nodes.

Filter Nodes

In graph view, you can click on a filter node and drag it to the desired location on the graph. The setting fields immediately reflect changes made by dragging filter nodes.

Filter node colors represent the following:

- **Green:** The filter node is selected and active. Dragging a green node changes the gain setting for PEQ filters and the frequency for all filter types.
- **Grey:** The filter node is selected but not active.
- **White:** The filter node is not selected and not active.
- **Black:** Dragging a black filter node changes bandwidth settings for Notch and PEQ filter types.

Adding Filters

To add additional filters, click the **Add Filter** button. The number of remaining available filters for the channel is shown under **Filters Remaining**.

Filter Types

Use the Type drop-down list to select from the following input filters:

- **All Pass.** Frequency range is 20.00Hz to 20.00kHz. All pass changes the phase of the audio signal at the set frequency.
- **High Pass.** Selectable frequency cutoff is 20.00Hz to 20.00kHz. Rolloff is 12dB/octave. Level is fixed at 0dB.
- **Low Pass.** Selectable frequency cutoff is 20.00Hz to 20.00kHz. Rolloff is 12dB/octave. Level is fixed at 0dB.
- **Notch.** Center frequency range is 20.00Hz to 20.00kHz. Bandwidth is from .05 to 5.00 octaves in .01 octave increments. Level is fixed at -80dB.
- **PEQ (Parametric Equalizer).** Center frequency range is 20Hz to 20kHz with resolution to 1Hz or 4 places (whichever is larger). Bandwidth is .05 to 5 octaves in .01 octave increments. Level range is -15 to +15dB in 0.5dB increments.

Frequency (Available for all filter types)

Use the **Frequency** selector box to set the center frequency (in Hertz) for the filter you are configuring. Range is from 20Hz to 20kHz in 1Hz increments. The default is 1kHz.

Gain (Available for PEQ filters only)

Use the **Gain** selector box to set the gain value for the filter you are configuring. Range is from -15 to 15dB. The default is 0dB.

Q (Available for Notch and PEQ filters only)

Use the **Q** (Quality Factor) selector box to select the ratio of the center frequency divided by the bandwidth. Q is the inverse of bandwidth, and the two parameters are linked. Therefore changing the Q value also changes the bandwidth value. Range is from .18 to 28.85.

Bandwidth (Available for Notch and PEQ filters only)

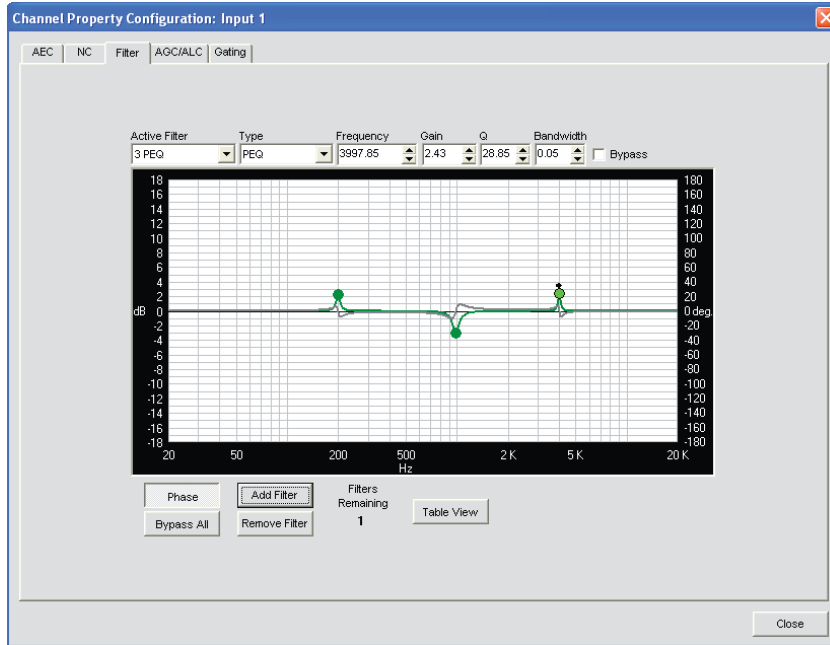
Use the **Bandwidth** selector box to set the difference between the upper and lower points of a filter's audio passband. Bandwidth is the inverse of Q, and the two parameters are linked. Hence changing the bandwidth value also changes the Q value. The range is .05 to 5.00 octaves.

Bypass (Available for all filter types)

Use the **Bypass** checkbox to bypass the currently selected active filter. This feature allows you to configure different filters and save them for future use without having to recreate them.

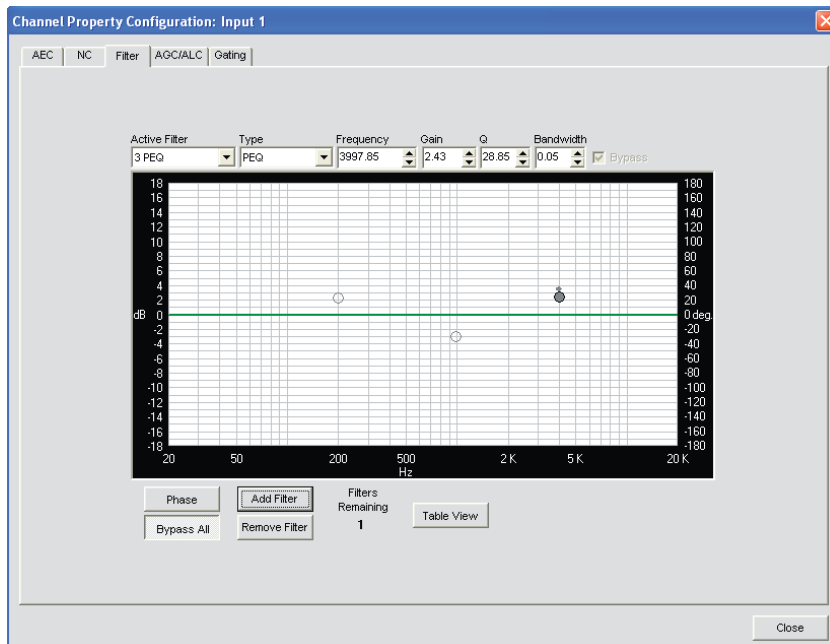
Phase

Press the **Phase** button to display the phase relationship of the graphed frequency response (appears as a grey line on the active filter graph). The phase scale appears on the right vertical axis of the graph.



Bypass All

Press the **Bypass All** button to bypass all filters for the selected input channel. The filters are grayed out in graph view, and the bypass status is shown as on in table view.



AGC/ALC TAB

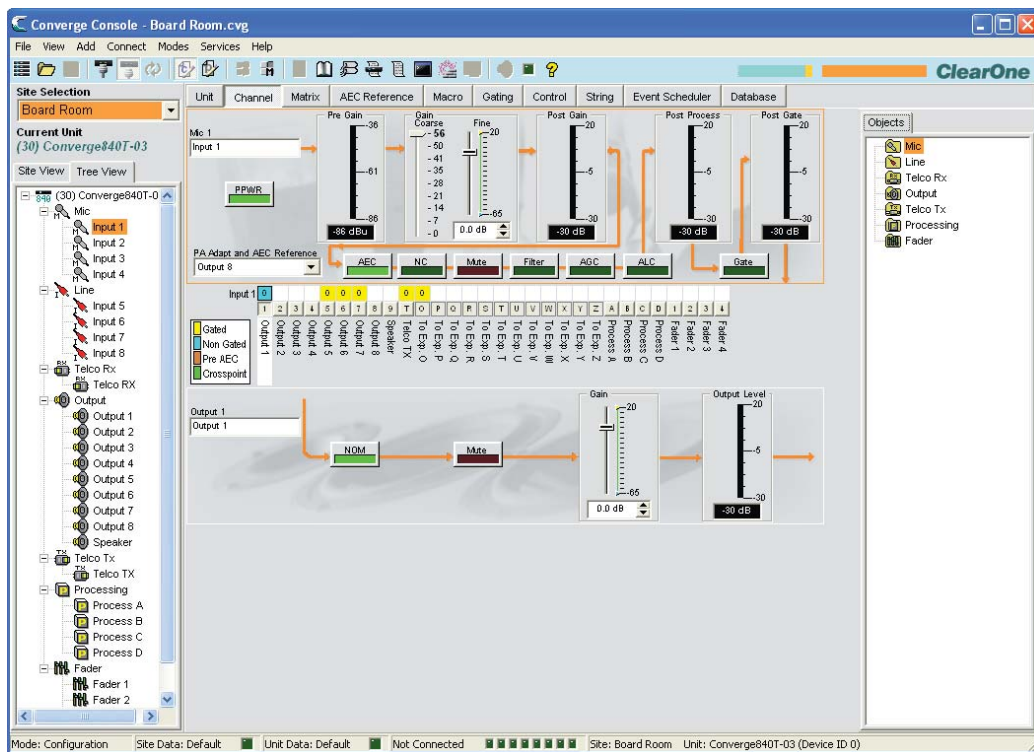
AGC/ALC enables **AGC (Automatic Gain Control)** or **ALC (Automatic Level Control)** and allows you to configure AGC settings for the selected input channel. Either AGC or ALC can be enabled—you cannot use them both at the same time.

AGC keeps an input signal at a target gain level that you select, and is generally used for **Line Input** channels.

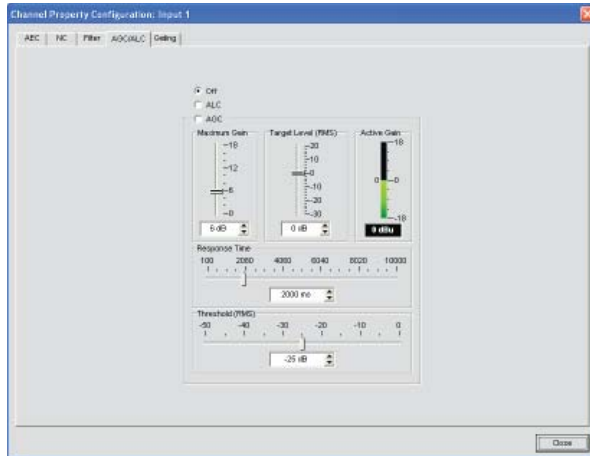
ALC automatically keeps an input signal at a constant level, and is generally used to keep speech levels constant on **Mic Input** channels.

Accessing AGC/ALC

With the **Channel** tab selected on the **Tab Bar**, select the desired **Mic input** channel on the **Tree View** tab in the **Site Pane**, and press either the **AGC** or **ALC** button (located just below the **Post Gain** meter).



The **Channel Property Configuration** screen appears with the **AGC/ALC** tab selected as shown below:



Use the **AGC/ALC** radio buttons to select **Off**, **ALC**, or **AGC**. The default is Off. ALC is performed automatically; there are no user-configurable settings for ALC.

NOTE: AGC occurs after gain and filter settings in the audio signal path.

The configuration controls for AGC are described in the following sections.

Maximum Gain Slider

Set the **Target Level** first, then set the **Maximum Gain** that you want the AGC to apply to the signal. Maximum Gain is set using an RMS (Root Mean Square) level, which is the average magnitude of the audio signal over time. Maximum Gain range is 0 to 18dB in 1dB steps. The default value is 6dB.

Maximum Gain and **Target Level** (RMS):

Target Level Slider

Target Level (RMS) sets dB level for AGC to maintain. Target Level range is from -30 to 20dB in 1dB steps. The default target level is 0dB.

Active Gain Meter

The **Active Gain Meter** displays the gain adjustment being applied to the channel by AGC.

Response Time Slider

Response Time sets the amount of time (in milliseconds) over which the level is averaged before AGC is activated or deactivated.

Threshold Slider

Threshold sets the dB level at which AGC engages. The Threshold is set using an RMS (Root Mean Square) level, which is the average magnitude of the audio signal over time.

NOTE: Setting the Threshold above the background noise level will prevent AGC from amplifying background noise.

For additional information, refer to the *Table of Contents* for these related topics:

- **Channel Tab Overview**
- **AEC (Acoustic Echo Cancellation)**
- **NC (Noise Cancellation)**

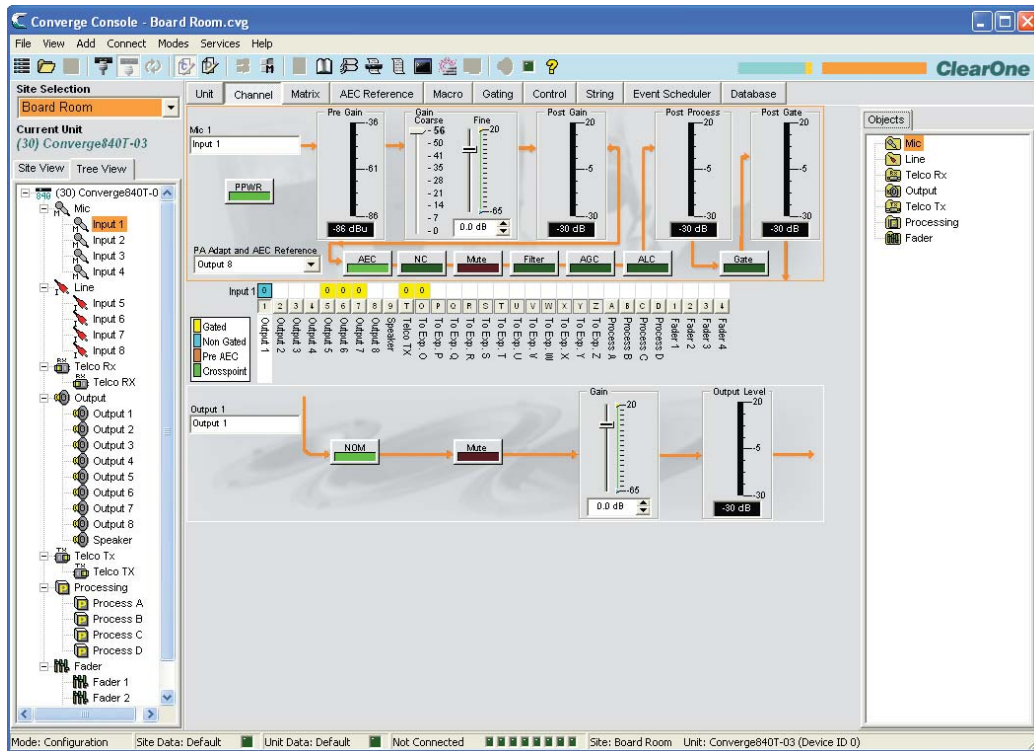
MIC GATING

The **Gate** button on the **Channel** tab enables you to configure gating control for individual **Mic Input** channels, and assign them to **Gating Groups**. There are two types of gating for Mic Input channels: **Auto Gating** and **Manual Gating**.

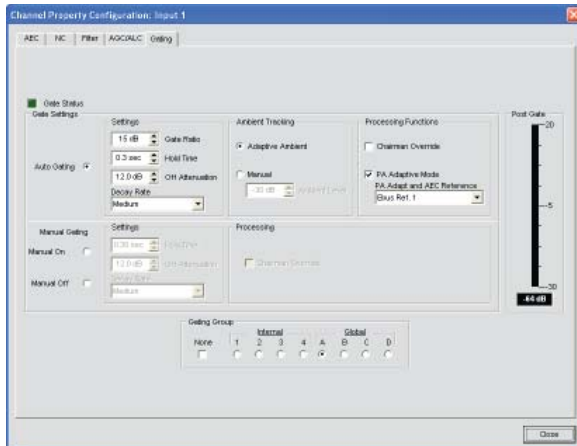
For more information about Gating Groups, see the **Gating Tab** section.

Accessing Channel Gating Configurations

With the **Channel** tab selected on the **Tab Bar**, select the desired **Mic Input** channel on the **Tree View** tab in the **Site Pane**, and press the **Gate** button (located just below the **Post Process** meter).



The Channel Property Configuration screen appears with the Gating tab selected.



Use the radio buttons to select **Auto Gating**, **Manual On** or **Manual Off**, which are described in the sections below.

Gating Settings: Auto Gating

The upper section of the Gate Settings section of the screen contains the gating controls for Auto Gating as shown below.



Auto Gating: Settings

- **Gate Ratio:** Specifies how much louder than the ambient level the audio level must be before the channel automatically gates on. The gate ratio range is from 0 to 50dB. The default is 15dB.
- **Hold Time:** Determines how long the channel stays gated on after the audio falls below the Gate Ratio threshold. The hold time range is from .1 to 8.0 seconds. The default is .3 seconds.
- **Off Attenuation:** Sets the amount of level reduction applied to a channel when it is gated off. The range is from 0 to 60dB. The default is 12dB.
- **Decay Rate:** Determines how fast a channel gates off after the Hold Time expires. The default is Medium.

NOTE: Changing Hold Time, Off Attenuation, and Decay Rate also changes the same settings under Manual Gating.

Auto Gating: Ambient Tracking

- **Adaptive Ambient:** Adjusts the ambient reference level as noise and room conditions change. When Adaptive Ambient is on, the mic channel monitors the ambient noise level on the input and adjusts the ambient level reference automatically. This means that the gate threshold level automatically increases or decreases based on background noise. The default is On.
- **Manual:** When Adaptive Ambient is set to **Manual**, the input will use the fixed ambient level you specify in the **Ambient Level** field as its gating reference.

Auto Gating: Processing Functions

- **Chairman Override:** Provides gating priority for this mic input over any other mic input within the same gating control (mixer) group. When a mic with Chairman Override enabled gates on, all mics which do not have Chairman Override enabled will gate off. The default is Off.
- **PA Adaptive Mode:** Uses the audio level on a specified output as the new ambient level when audio is present at the power amplifier. This prevents loudspeaker audio from gating on the mic while still allowing people in the room to gate on microphones when they speak (provided that their voices are louder than the loudspeaker audio). For example, you might decide to play background music from a CD player during a presentation. PA Adaptive Mode allows you to use the output routed from the CD player as the ambient reference to prevent the CD player's audio from gating on microphones. The default is on.
- **PA Adapt and AEC Reference:** When **PA Adaptive Mode** is selected, you must define the output that will be used as the reference source for PA adaption and Acoustic Echo Cancellation (AEC). Select a source in the **PA Adapt and AEC Reference** drop-down list. You can use any one of the outputs, expansion bus references, virtual references, or speaker output channels as the reference.

Gate Settings: Manual Gating

The lower section of the **Gate Settings** section of the screen contains gating configuration controls for **Manual Gating** as shown below.



Manual Gating: Manual On/Manual Off

Select the **Manual On** radio button to gate the channel on, or **Manual Off** to gate the channel off. Off gating behavior is controlled by the settings described in the next section.

Manual Gating: Settings

- **Hold Time:** Determines how long the channel stays gated on after the channel is manually gated off. The hold time range is from .1 to 8.0 seconds. The default is .3 seconds.
- **Off Attenuation:** Sets the amount of level reduction applied to a channel when it is manually gated off. The range is from 0 to 50dB. The default is 12dB.
- **Decay Rate:** Determines how fast a channel gates off after the Hold Time expires. The default is Medium.

NOTE: Changing **Hold Time, Off Attenuation, and Decay Rate** also changes the same settings under **Auto Gating**.

Both Auto Gating and Manual Gating are affected by Gating Group membership as described in the next section.

Gating Groups

In addition to specifying gating characteristics for each **Mic Input** channel, you can assign the channel to a **Gating Group** for greater flexibility and control. When inputs are assigned to a gating group, the gating information from the inputs is used to control how the entire mixer behaves. Gating Groups are created and defined using the **Gating Tab** on the **Tab Bar** in Console.

The 880, 840T, and 8i feature four internal gating groups (**Internal 1–4**) and four global gating groups across the expansion bus (**Global A–D**). Mic Inputs can only be used in one gating group at a time. If an input is not assigned to a gating group, that mic's gating properties are independent, and they have no effect on any gating group. When gating groups span two or more units (global gating groups), the settings must be the same for each unit attached to the global gating group.

NOTE: Input channels can be assigned to one and only one **Gating Group** at a time.

Mic Inputs are routed to **Global Group A** by default. To assign a gating group, select an **Internal** or **Global** radio button in the **Gating Group** section of the screen, or select **None** to have the Mic Input gate independently of any gating group.



Post Gate Meter



The **Post Gate Meter** displays the audio level of the selected channel after Auto or Manual Gating settings are applied. Meter range is from -30 to +20dB.

For more information, refer to the *Table of Contents* for these related topics:

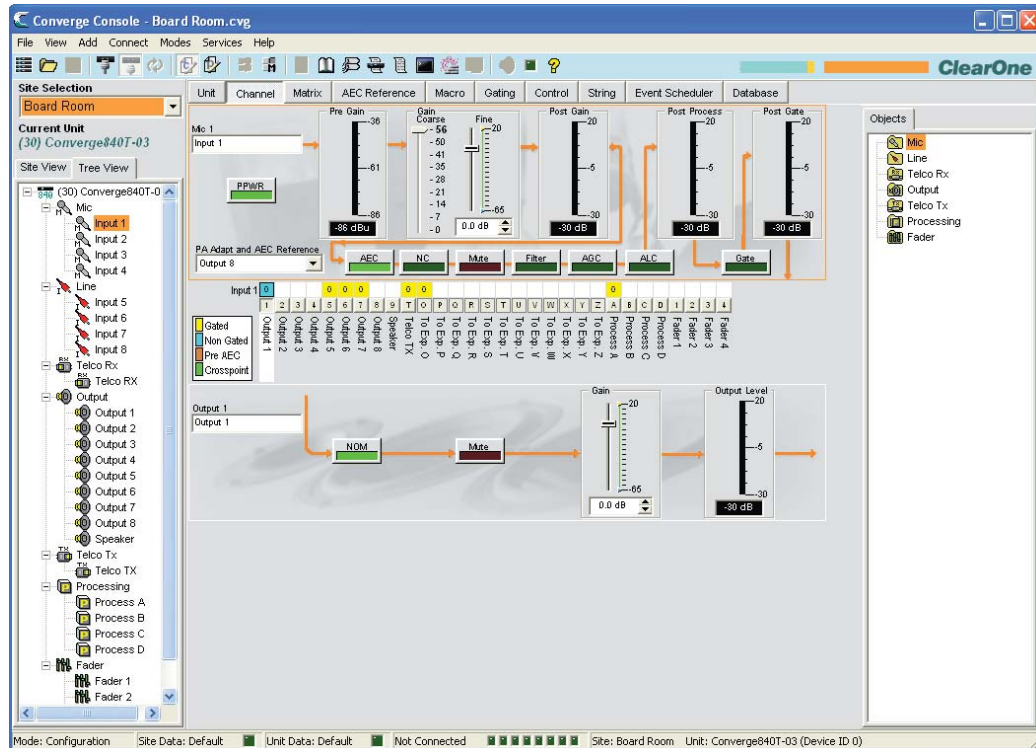
- **Gating Tab**
- **AEC (Acoustic Echo Cancellation)**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **NC (Noise Cancellation)**
- **Filters**
- **Line Input Settings**
- **Mic Input Settings**

MIC INPUT SETTINGS

Mic Input Settings enable you to customize mic input channel settings using the **Channel** screen.

Accessing Mic Input Settings

With the **Channel** tab selected on the **Tab Bar**, select the desired mic input channel on the **Tree View** tab in the **Site Pane**.



The center pane displays a signal processing diagram, meters, and configuration controls for the selected mic input channel as shown above. Note that the meters and configuration controls are shown at the appropriate point in the signal path.

The meters and configuration controls for mic input channels are explained in the following sections.

Channel Label



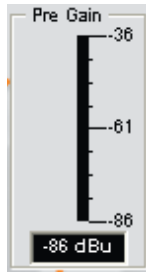
Rename the channel by entering a name in the **Label** entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

PPWR (Phantom Power)



The **PPWR (Phantom Power)** button toggles phantom power on and off. Phantom power is an auxiliary power source used to power certain types of microphones. Phantom power voltage is 24VDC. The default is On.

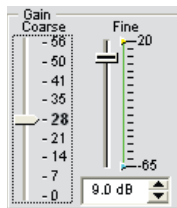
Pre Gain Meter



The Pre Gain meter displays the mic input level before gain adjustments. Meter range is determined by the Coarse Gain Slider in the Gain section of the screen as described below.

NOTE: All meters in Console are peak-level meters.

Gain Section

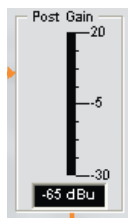


The **Coarse** and **Fine** gain sliders are used to match the level settings between mic inputs, and to adjust the volume level for a given mic input channel. The **Min/Max** fine gain sliders are used to set minimum and maximum gain settings, and to report min/max gain settings via serial commands.

In general, you should set the **Coarse** gain slider to 56dB for a mic input, 28dB for active equipment that requires an input between mic and line level, or 0dB for a line level input device.

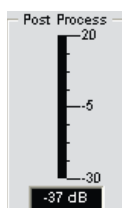
Use the **Fine** gain slider to adjust input volume level. You can also set fine gain in .5dB increments using the **Up/Down** buttons, or enter a value directly in the field.

Post Gain Meter



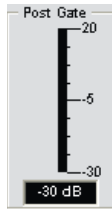
The **Post Gain Meter** displays the audio level after gain adjustments.

Post Process Meter



The Post Process Meter displays the audio level after it passes through all mic input processing, such as Processing channels, Filters, AEC, NC, AGC/ALC, and Mute.

Post Gate Meter



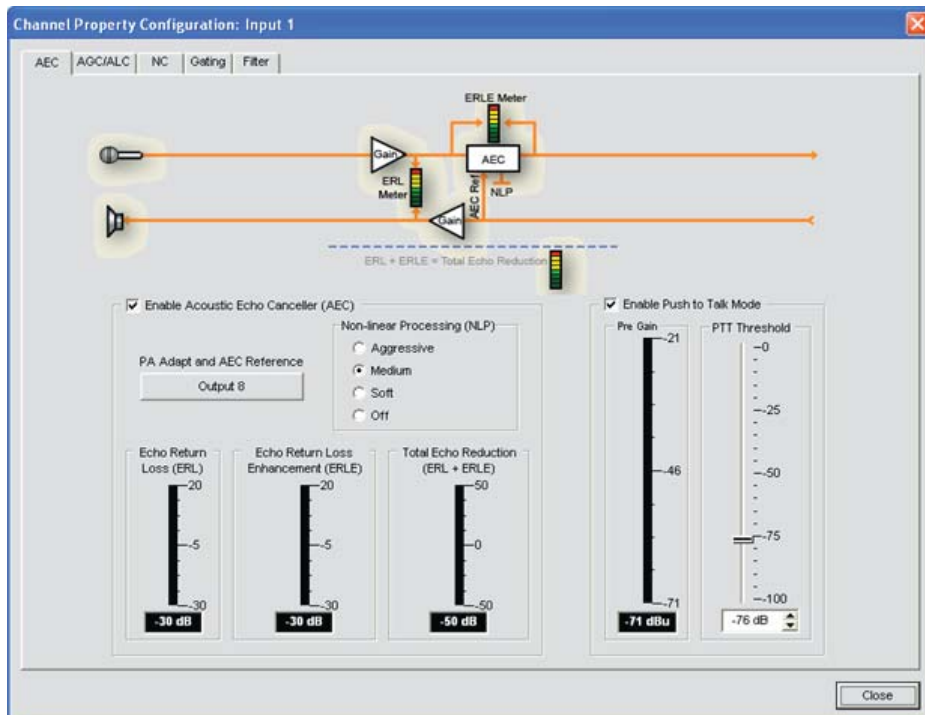
The **Post Gate Meter** displays the audio level after gating. Channel gating for mic inputs is configured on the **Gating** tab of the **Channel Property Configuration** window for mic input channels, which is described in the next section.

Channel Configuration Buttons



The **Channel Configuration Buttons** enable you to configure the available features for mic input channels. With the exception of the **Mute** button, which toggles muting, clicking a channel configuration button displays the **Channel Property Configuration** window. Each feature is shown on a tab in the window that corresponds with the configuration button shown in the **Center Pane**.

For example, clicking the **AEC** button displays the Channel Property configuration window with the **AEC** tab selected as shown below:

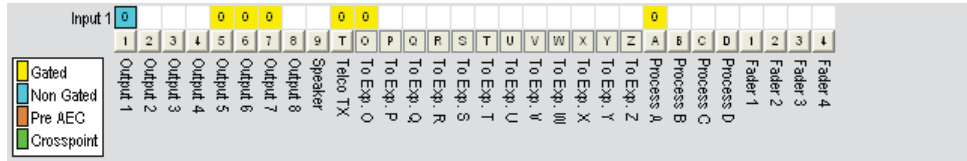


For more information on each configuration feature, see the following topics:

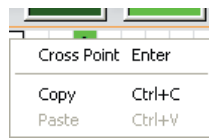
- **AEC (Acoustic Echo Cancellation)**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **NC (Noise Cancellation)**
- **Mic Gating**
- **Filters**

Channel Routing Matrix: Inputs

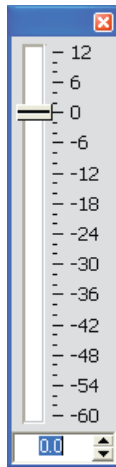
The channel routing matrix section of the **Channel** screen shows the matrix row and audio routing configuration for the selected input channel (mic input 1 in this case). Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a colored box. The dB level for set cross points is shown numerically in the box.



To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu.



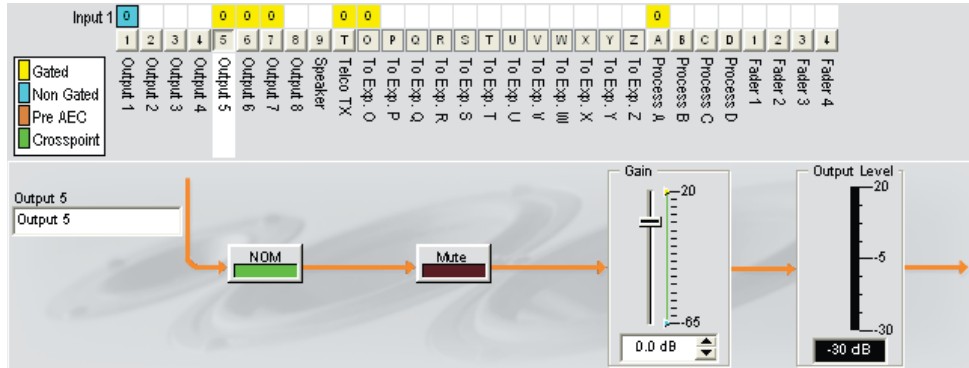
The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB. Note that the level to the nearest dB is displayed in the cross point for the channel on the Matrix.



NOTE: Your changes are automatically saved when you close the slider.

Expanded Channel Routing Matrix

In the channel routing matrix, pressing the button underneath an **Output**, **Process**, or **Fader** cross point box displays the signal flow diagram and configuration controls for that channel. For example, clicking on **Output 5** displays the routing configuration for output channel 5 as shown below.



This display is identical to that shown in **Channel** when the output channel is selected in the **Tree View** pane. See **Output Settings** for more information.

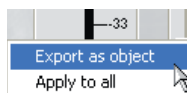
You can change the channel **Label** (name) of the output channel in the label entry field; toggle **NOM** constant gain on or off; toggle **Mute** on or off; and use the **Gain slider** to set the gain level for the channel. The **Output Level** meter shows the level for the channel in real time as you make configuration changes.

NOTE: Changes to channel configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from “**Output 1**” to “**Ceiling Speakers**” changes the name of the output channel in the **Tree View** pane, and everywhere else the label appears in **Console**.

Creating Channel Objects

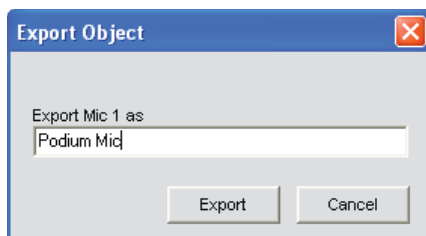
One of the most powerful features of the **Console** software is the ability to create **Audio Devices** and **Channel Objects**. Channel objects contain all settings for the channel at the time the object is created. After configuring an input using the **Channel** tab as described in this topic, you can save it into the database, and use drag and drop configuration to streamline configuration tasks for your **Converge Pro** installations.

To save an input channel configuration, right click in the **Channel** screen (anywhere above the channel routing matrix). From the shortcut menu that appears, select **Export Object** as shown below.



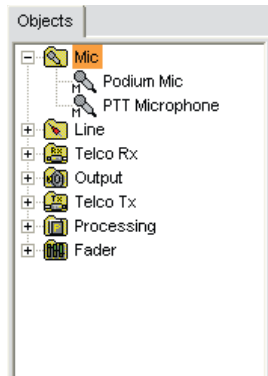
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the **Channel** screen.

Console saves the object to the database and displays it in the **Object Tree** pane as shown below.



For more information on using audio devices and channel objects, refer to the *Table of Contents* for the following topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

Optimizing Input Gain Structure

Optimizing gain structure for input channels maximizes the signal-to-noise ratio for the channel and ensures optimal audio performance. Before configuring an input channel, ClearOne recommends that you review the *Optimizing Gain Structure* topic.

For additional information, refer to the *Table of Contents* for these related topics:

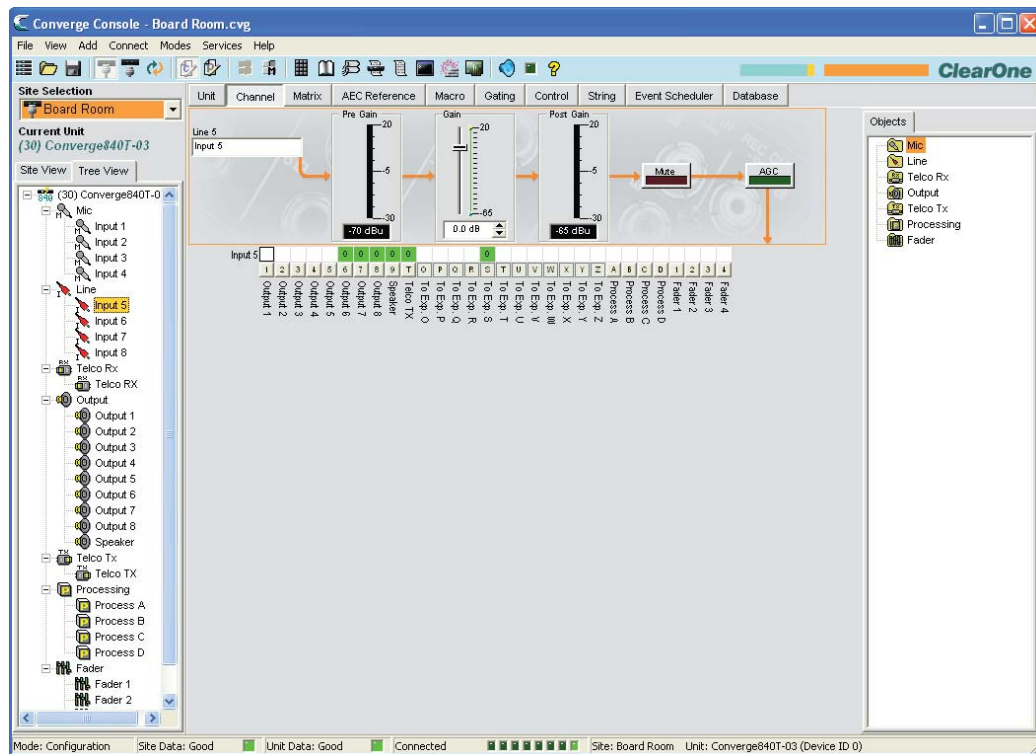
- **Channel Tab Overview**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **Mic Gating**
- **Gating Tab**
- **Matrix Tab**
- **Drag & Drop Configuration**
- **Database Tab**
- **Line Input Settings**
- **Output Settings**

LINE INPUT SETTINGS

Line Input Settings enable you to customize line input channel settings. All settings for a given line input are available on the **Channel** screen.

Accessing Line Input Settings

With the **Channel** tab selected on the **Tab Bar**, select the desired line input channel on the **Tree View** tab in the **Site Pane**.



The **Center Pane** displays a signal processing diagram, meters, and configuration controls for selected line input channel as shown above. Note that the meters and configuration controls are shown at the appropriate point in the signal path.

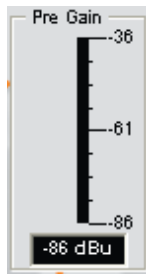
The meters and configuration controls for line inputs are explained in the following sections.

Channel Label



Rename the channel by entering a name in the Label entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

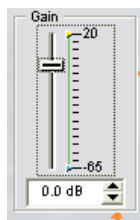
Pre Gain Meter



The **Pre Gain Meter** shows the line input level before gain adjustments.

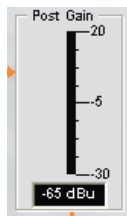
NOTE: All meters in Console are peak-level meters.

Gain Slider



The **Gain Slider** adjusts the line input volume level. The **Min/Max** fine gain sliders are used to set minimum and maximum gain settings, and to report min/max gain settings via serial commands. You can also set the gain in .5dB increments using the **Up/Down** buttons, or enter a value directly in the field.

Post Gain Meter



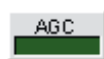
The **Post Gain Meter** shows the input level after gain adjustments.

Mute Button

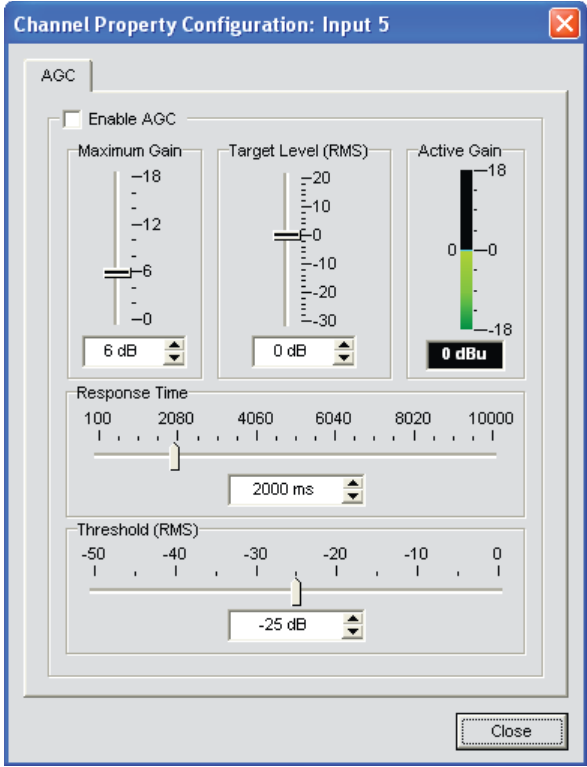


Clicking the **Mute** button toggles muting. The default is Off.

AGC (Automatic Gain Control) Button



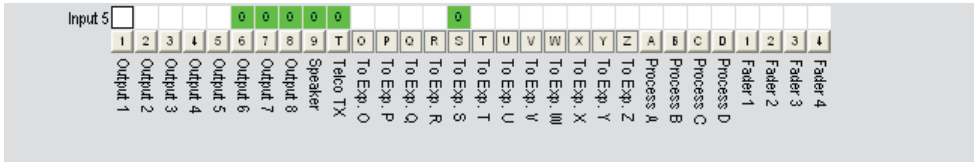
Clicking the **AGC (Automatic Gain Control)** button displays the **Channel Property Configuration** dialog for the selected input channel as shown below.



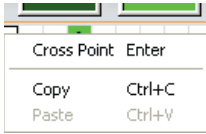
Select the **Enable AGC** checkbox to enable AGC, or deselect it to disable AGC. For AGC configuration details, see **AGC Configuration Settings**.

Channel Routing Matrix: Line Inputs

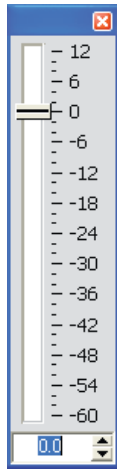
The channel routing matrix shows the associated matrix row and audio routing configuration for the selected input channel (line input 5 in this case). Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a green box. The dB level for set cross points is shown numerically in the box.



To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu.



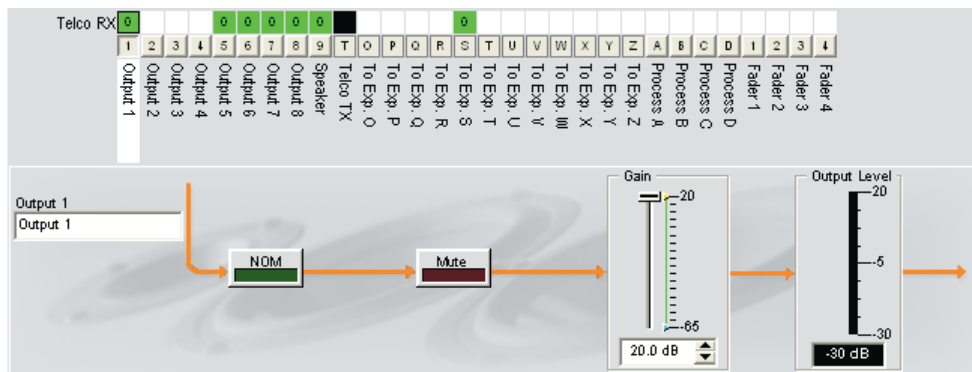
The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

Channel Routing Matrix: Outputs, Processing, Faders

In the channel routing matrix, pressing the button underneath an **Output**, **Process**, or **Fader** cross point box displays the signal flow diagram and configuration controls for that channel. For example, clicking on **Output 5** displays the routing configuration for output channel 5 as shown below.



This display is identical to that shown in **Channel** when the output channel is selected in the **Tree View** pane. See **Output Settings** for more information.

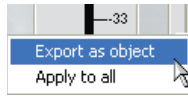
You can change the channel **Label** (name) of the output channel in the label entry field; toggle **NOM** constant gain on or off; toggle **Mute** on or off; and use the **Gain slider** to set the gain level for the channel. The **Output Level** meter shows the level for the channel in real time as you make configuration changes.

NOTE: Changes to configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from “**Output 1**” to “**Ceiling Speakers**” changes the name of the output channel in the **Tree View** pane, and everywhere else the label appears in **Console**.

Creating Channel Objects

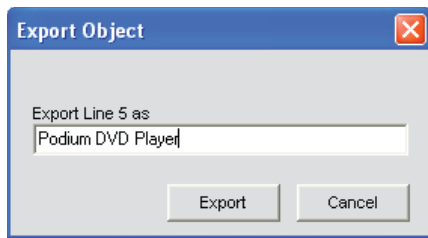
One of the most powerful features of the **Console** software is the ability to create **Channel Objects**. Channel objects capture all settings for the channel at the time the object is created. After configuring an input using the **Channel** tab as described in this topic, you can save it into the **Database**, and use drag and drop configuration to streamline configuration tasks.

To save an input channel configuration, right click in the **Channel** screen (anywhere above the channel routing matrix). From the shortcut menu that appears, select **Export Object** as shown below.



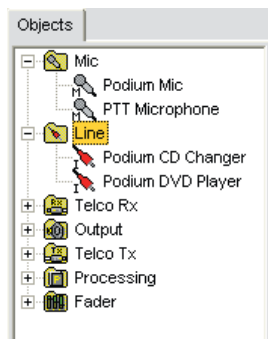
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen.

Console saves the object to the database and displays it in the **Object Tree** as shown below.



Optimizing Input Gain Structure

Optimizing gain structure for input channels maximizes the signal-to-noise ratio for the channel and ensures optimal audio performance. Before configuring an input channel, ClearOne recommends that you review the *Optimizing Gain Structure* topic.

For more information, refer to the *Table of Contents* for these related topics:

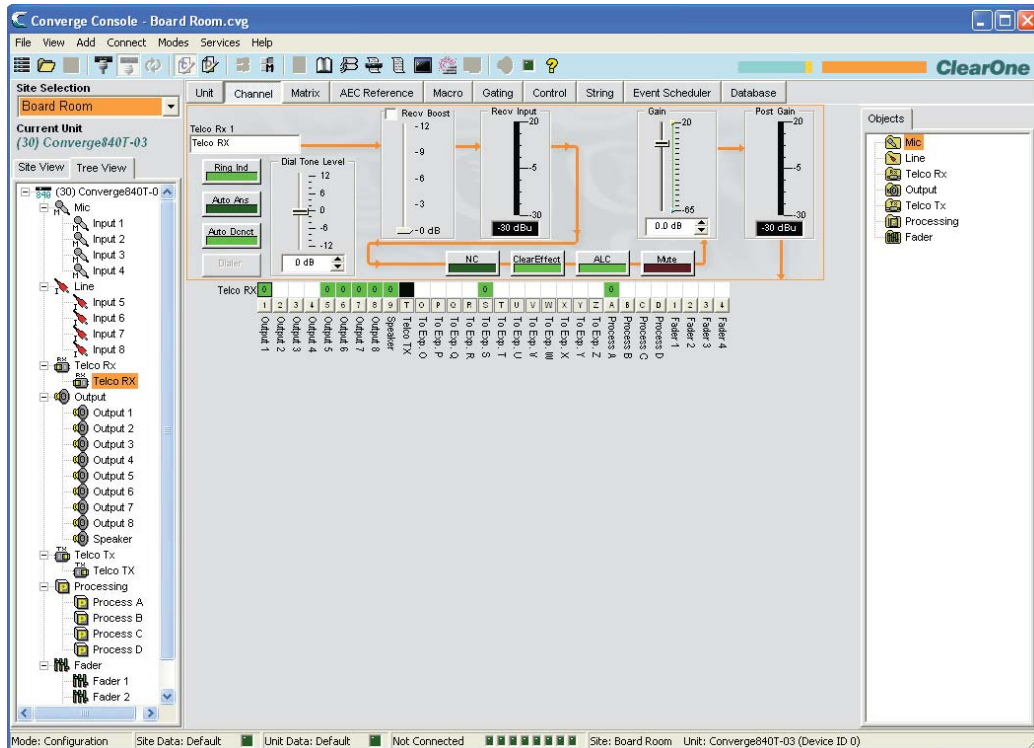
- **Channel Tab Overview**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **Mic Gating**
- **Gating Tab**
- **Matrix Tab**
- **Drag & Drop Configuration**
- **Database Tab**
- **Mic Input Settings**
- **Output Settings**

TELCO RX SETTINGS (840T AND TH20)

Telco Rx Settings enable you to customize telephone receive channel settings using the **Channel** screen.

Accessing Telco Rx Settings

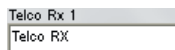
With the **Channel** tab selected on the **Tab Bar**, select the **Telco Rx** channel on the **Tree View** tab in the **Site Pane**.



As shown above, the center pane displays a signal flow diagram for the telco rx channel, real-time peak-level meters, as well as the channel routing matrix that displays the audio routing configuration for the channel. Configuration settings for the telco rx channel are displayed as controls (buttons, sliders, check-boxes, selection lists) which are located at the appropriate stage in the signal flow.

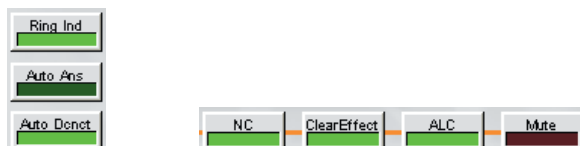
The following sections describe how to use these controls (in order from left-to-right and top-to-bottom as they appear in the signal flow) to configure the telco receive channel settings for your installation.

Channel Label



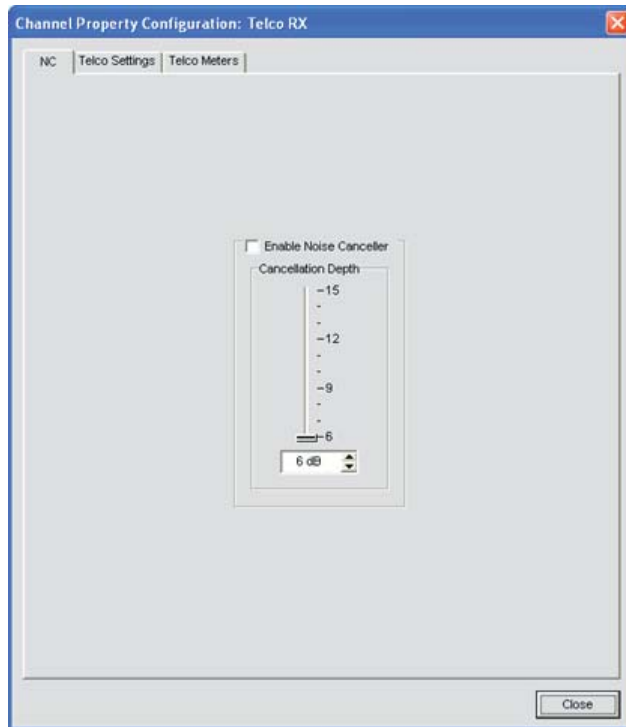
Rename the channel by entering a name in the **Label** entry field (optional). Labels are shown throughout Console wherever the channel is referenced.

Channel Configuration Buttons



The Channel Configuration Buttons enable you to configure settings for the telco rx channel. With the exception

of the Mute, ClearEffect, and ALC buttons, which toggle their respective functions and have no user-configurable settings, clicking a channel configuration button displays the Channel Property Configuration window as shown below.



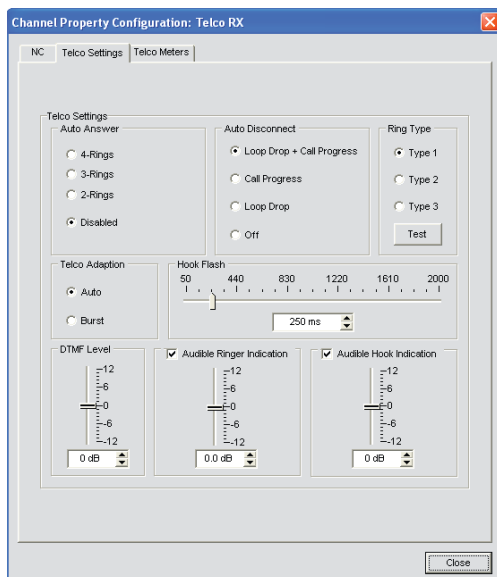
The window contains three tabs: **NC (Noise Cancellation)**, **Telco Settings**, and **Telco Meters**, which are described in the following sections.

NC (Noise Cancellation) Tab

Select the **Enable Noise Canceller** checkbox to enable NC for the channel. Adjust the **Cancellation Depth** slider to the dB setting which provides the best combination of low noise and maximum speech clarity. The attenuation depth can be set in 1dB increments from 6dB to 15dB. The default is 6dB. The default for NC is off.

You can use noise cancellation on all types of input channels. See **NC (Noise Cancellation)** for more information.

Telco Settings Tab



Settings available on the **Telco Settings Tab** include:

Auto Answer: Set the number of rings before the unit connects an incoming call (or disable the function). The default is Disabled.

Auto-Disconnect: Select the auto disconnect mode to control when the unit disconnects a connected call. Modes include **Loop Drop + Call Progress**, **Call Progress**, and **Loop Drop**, and **Off**. The default is Loop Drop + Call Progress.

Ring Type: Select from three different ring tones (**Type 1**, **Type 2**, **Type 3**). To test a particular tone, click **Test** after you have selected the tone.

Telco Adaptation: Some applications require the unit to adapt to line conditions using a white-noise burst (**Noise**) rather than automatically (Auto). The default is **Auto**.

Hook Flash: Sends a momentary interruption in the line seizure, allowing activation of options such as 3-way calling, call waiting, and call hold. This feature is dependent on the services offered by your telephone company. You can set the duration of the hook flash using the slider or the selector box. Range is 50ms to 2 seconds in 10ms steps. The default is 250ms.

DTMF Level: This feature allows you to adjust the DTMF tone level in relationship to the participant audio level in the room. The level can be adjusted in 1dB steps from a nominal level of 0dB to plus or minus 12dB in 1dB increments. The default is 0dB.

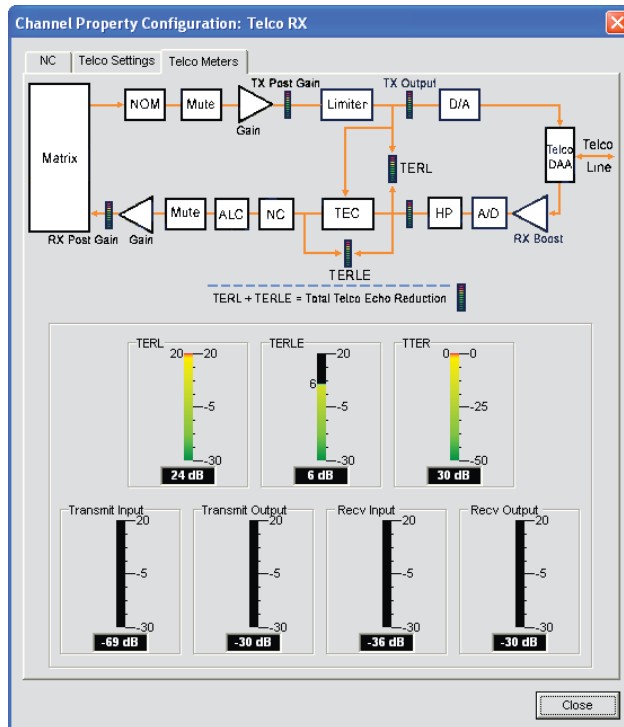
Audible Ring Indication: When this feature is enabled, an audible ring is heard for incoming calls. The level adjustment allows you to customize the level in relationship to the participant audio level in the room. The level can be adjusted in 1dB steps from a nominal level 0 (default) to plus or minus 12dB in 1dB increments. The default is 0dB.

Audible Hook Indication: When the unit goes off hook (connects) a beep is injected into the receive channel and transmit channel of the unit. When the unit goes on hook (disconnects), a series of two beeps is injected into the receive channel to indicate that the call has been dropped. This indicator can be turned on or off using the **Audible**

Hook Indication check box. The default is On. The level adjustment allows you to customize the level in relationship to the participant audio level in the room. The level can be adjusted using the slider or selector box from nominal level 0 to plus or minus 12dB in 1dB steps. The default is 0dB.

Telco Meters Tab

The Telco Meters tab displays a round-trip signal flow diagram for the selected telco rx, as well as real-time level meters for the signal at each stage of processing. The settings on this tab cannot be modified.

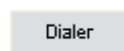


NOTE: When you click the **Close** button (bottom right corner of screen), or close the window manually, any changes you make in the tabs of the **Channel Property Configuration: Telco RX** screen are automatically saved.

The telco meters include:

- **Telephone Echo Return Loss (TERL):** This meter shows the amount of echo loss from the telephone line to the unit.
- **Telephone Echo Return Loss Enhancement (TERLE):** This meter shows the enhancement added by the telephone hybrid to reduce echo below the audible level.
- **Total Telephone Echo Reduction (TTER):** This meter shows the sum of TERL and TERLE.
- **Transmit Input:** This meter shows the audio level input from the matrix to the telephone line.
- **Transmit Output:** This meter shows the transmit audio level output to the telephone line.
- **Receive Input:** This meter shows the audio level input received from the telephone line.
- **Receive Output:** This meter shows the receive audio level output to the matrix.

Dialer Button

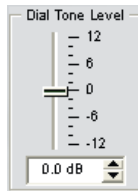


The **Dialer** button opens the telephone dialer, allowing you to place conference calls.



See the *Dialer* topic for more information on using the dialer and its features.

Dial Tone Level Slider



The **Dial Tone Level** slider allows you to set dial tone gain using the slider or selector box. The default is zero. Range is -12dB to 12dB in 1dB increments.

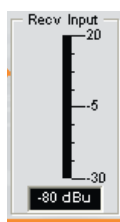
Recv Boost Slider



The **Receive Boost** slider allows you to set the gain for the incoming telco rx signal. This is typically used for low-level telephone lines, allowing the signal to be boosted to an acceptable level of performance. To use **Receive Boost**, check the **Recv Boost** check box, then move the slider to the desired gain settings.

Recv Boost adds up to 12dB of gain to the signal (adjustable in 3dB increments from 0dB to 12dB). The default is Off.

Recv Input Meter



The **Receive Input** meter displays the dB level of the incoming telco signal prior to any signal processing.

NOTE: All meters in Console are peak-level meters.

NC Button



Clicking the **Noise Cancellation** button opens the **Channel Property Configuration: Telco RX** window with the **NC** tab selected, allowing you to configure noise cancellation settings.

To use noise cancellation, click **Enable Noise Canceller**, then adjust the **Cancellation Depth** to the setting which provides the best combination of low noise and maximum speech clarity for your installation. The attenuation depth can be set in 1dB increments from 6dB to 15dB. The default is 6dB. The noise canceller default is Off.

Clear Effect Button



To reduce bandwidth requirements, telephone lines limit audio bandwidth to a range of 300Hz–3.3kHz. ClearEffect enhances the incoming signal from a telephone line to emulate wideband audio by adding high and low frequencies to the audio signal.

Click the **ClearEffect** button to toggle this feature on and off. The default is On.

ALC Button



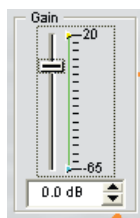
Clicking the **Automatic Level Control** button toggles ALC on and off. ALC provides auto-leveling for all conference call participants on the telco rx line, keeping soft and loud participants at a consistent level. The default is Off. See AGC/ALC for additional information.

Mute Button



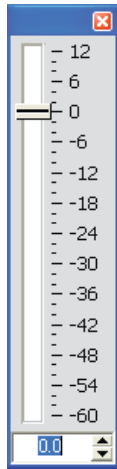
Clicking the **Mute** button toggles muting for the telco receive channel. The default is Off.

Gain Slider



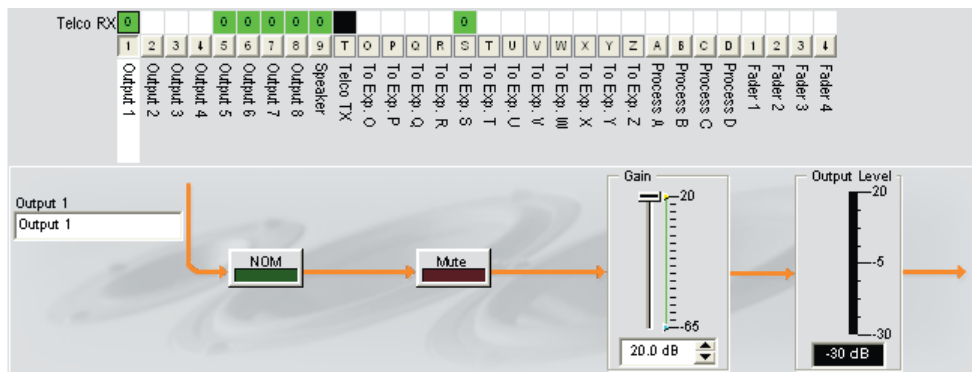
The **Gain** slider changes the gain for the telco receive channel from nominal 0. To change the value, use the slider or the selector box. Range is from -65 to +20dB in .5dB increments. The default is 0dB.

The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

In the channel routing matrix, pressing the button underneath an **Output**, **Process**, or **Fader** cross point box displays the signal flow diagram and configuration controls for that output channel as shown below.



This display is identical to that shown in **Channel** when the output channel is selected in the **Tree View** pane. See **Output Settings** for more information.

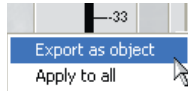
You can change the label (name) of the output channel in the **Output** entry box, toggle the **NOM** button to turn constant gain mode on or off, toggle the **Mute** button to mute or un-mute the channel, and use the **Gain** slider to set the gain level for the channel. The **Output Level** meter shows the level for the channel in real time.

NOTE: Changes to configuration settings made in the channel routing matrix apply globally to the output, processing, or fader channel. For example, changing the label (name) from **“Output 1”** to **“Ceiling Speakers”** changes the name of the channel in the **Tree View** pane, and everywhere else the label appears in **Console**.

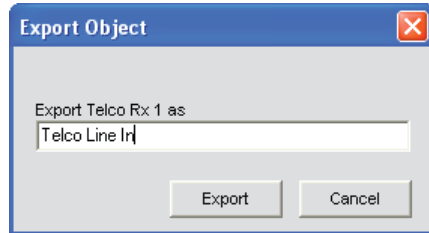
Creating Channel Objects

One of the most powerful features of the Console software is the ability to create Channel Objects. Channel objects capture all settings for the channel at the time the object is created. After configuring an input using the Channel tab as described in this topic, you can save it into the Database, and use drag and drop configuration to streamline configuration tasks.

To save a telco rx channel configuration, right click in the **Channel** screen (anywhere above the channel routing matrix). From the shortcut menu that appears, select **Export Object** as shown below.

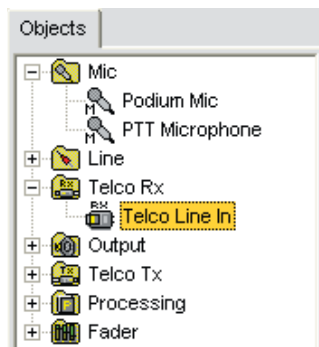


Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen

Console saves the object to the database and displays it in the **Object Tree** as shown below.



For more information on using audio devices and channel objects, refer to the *Table of Contents* for these topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

Optimizing Input Gain Structure

Optimizing gain structure for input channels maximizes the signal-to-noise ratio for the channel and ensures optimal audio performance. When configuring the telco rx channel, ClearOne recommends that you follow the procedures outlined in the *Optimizing Gain Structure* topic.

For more information, refer to the *Table of Contents* for these related topics:

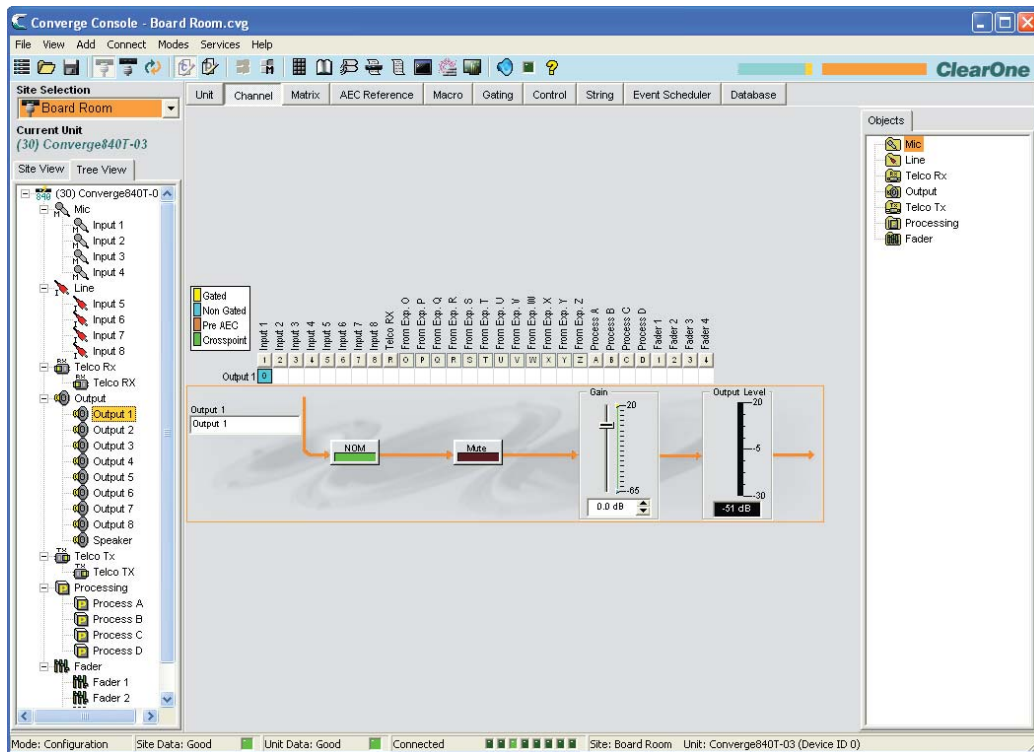
- **Channel Tab Overview**
- **NC (Noise Cancellation)**
- **Mic Gating**
- **Gating Tab**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **Label Editor**
- **Output Settings**
- **Telco Tx Settings (840T and TH20)**

OUTPUT SETTINGS

Output Settings enable you to customize output channel settings. All settings for a given output are available on the **Channel** screen.

Accessing Output Settings

With the **Channel** tab selected on the **Tab Bar**, select the desired output channel on the **Tree View** tab in the **Site Pane**.



The center pane of the screen displays a signal flow diagram, a real-time **Output Level Gain** meter, as well as the channel routing matrix, which shows the audio routing configuration for the selected output channel.

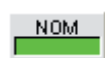
The following sections describe how to use output channel configuration controls.

Channel Label



Rename the channel by entering a name in the **Label** entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

NOM (Number of Open Mics/Constant Level)



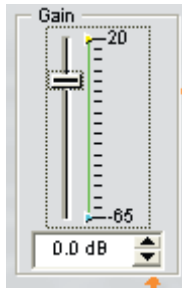
Maintains a constant output level by automatically adjusting gain levels based on the number of mics gated on and routed to the selected output channel. NOM reduces the output level proportionally by 3dB for every doubling in the number of open mics. When using NOM over the expansion bus, only the first four audio channels (O, P, Q, and R) support passing NOM information. The default is on.

Mute Button



Clicking the **Mute** button toggles muting. The default is Off.

Gain Slider

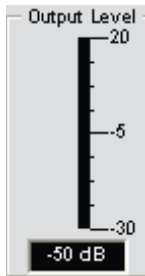


The **Gain** slider adjusts the output gain level. To change the value, use the slider or selector box. Range is from -65 to +20dB in .5dB increments. The default is 0dB.

Min/Max Limits

Use the yellow and green upper and lower limit arrows on the **Gain Scale** in the **Gain** section of the screen to set minimum and maximum gain level limits. These limits only apply when using relative gain commands; absolute gain commands can exceed the min and max limits. Min/Max limits apply to all serially connected control devices and prevent users from adjusting levels beyond the specified levels.

Output Level Meter



Shows the signal level in dB when a signal is present.

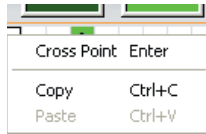
Channel Routing Matrix: Outputs

The channel routing matrix shows the matrix row and audio routing configuration for the selected channel (Output 1 in this case). Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a green box. The dB level for set cross points is shown numerically in the box.

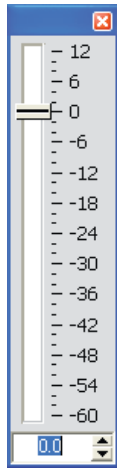
	Input 1	Input 2	Input 3	Input 4	Input 5	Input 6	Input 7	Input 8	Telco RX	From Exp. O	From Exp. P	From Exp. Q	From Exp. R	From Exp. S	From Exp. T	From Exp. U	From Exp. V	From Exp. W	From Exp. X	From Exp. Y	From Exp. Z	Process A	Process B	Process C	Process D	Fader 1	Fader 2	Fader 3	Fader 4
Output 1	0																												

You can click directly on any cross point box in the top row to set a parameter as cross point, or leave it blank, as required for your installation. To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut

menu.



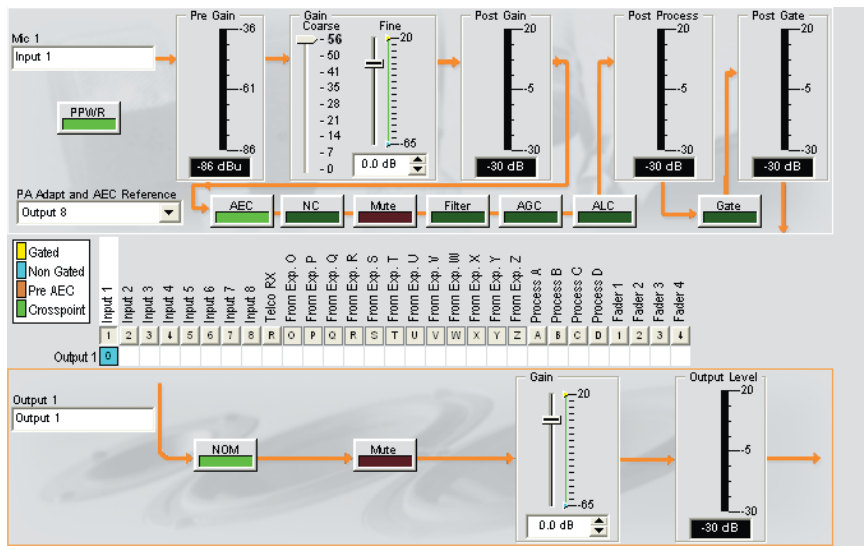
The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

Channel Routing Matrix: Inputs, Processing, Faders

In the channel routing matrix, pressing the button above an **Input**, **Process**, or **Fader** cross point box displays the signal flow diagram and configuration controls for that channel.



This display is identical to that shown in Channel when the channel is selected in the Tree View pane. See *Mic Input Settings*, *Line Input Settings*, *Processing Settings*, and *Fader Settings* for more information.

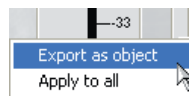
You can change the label (name) of the channel in the Output entry box, toggle the NOM button to turn constant gain mode on or off, toggle the Mute button to mute or un-mute the channel, and use the Gain slider to set the gain level for the channel. The Output Level meter shows the level for the channel in real time.

NOTE: Changes to configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from “**Input 1**” to “**Ceiling Mic**” changes the name of the channel in the Tree View pane, and everywhere else the label appears in Console.

Creating Channel Objects

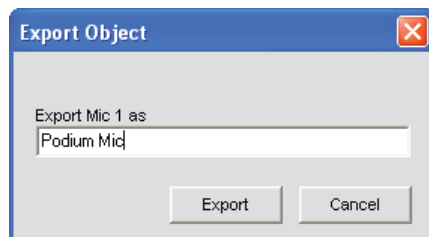
One of the most powerful features of the Console software is the ability to create Channel Objects. Channel objects capture all settings for the channel at the time the object is created. After configuring an input using the Channel tab as described in this topic, you can save it into the Database, and use drag and drop configuration to streamline configuration tasks.

To save an input channel configuration, right click in the **Channel** screen (anywhere above the channel routing matrix). From the shortcut menu that appears, select **Export Object** as shown below.



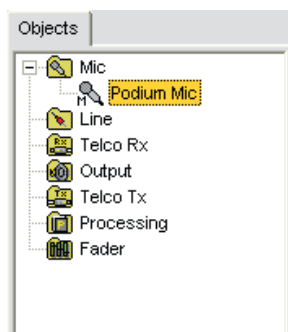
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen.

Console saves the object to the database and displays it in the **Object Tree** as shown below.



For more information on using audio devices and channel objects, see the *Table of Contents* for the following topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

Optimizing Output Gain Structure

Optimizing gain structure for output channels ensures optimal audio performance. When initially configuring an output channel, ClearOne recommends that you follow the procedures outlined in the *Optimizing Gain Structure* topic.

For additional information, refer to the *Table of Contents* for these related topics:

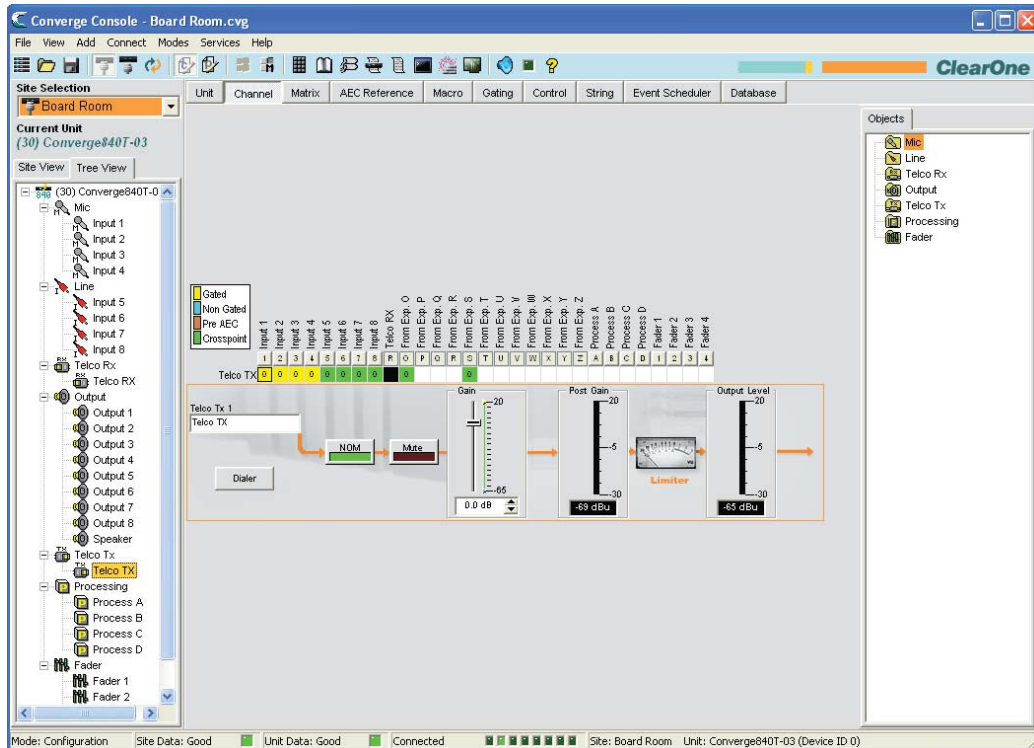
- **Channel Tab Overview**
- **Mic Gating**
- **Gating Tab**
- **Line Input Settings**
- **Mic Input Settings**
- **Processing Settings**
- **Fader Settings**
- **Telco Rx Settings (840T and TH20)**
- **Optimizing Gain Structure**

TELCO TX SETTINGS

Telco Tx Settings enable you to customize telephone transmit channel settings using the **Channel** screen.

Accessing Telco Tx Settings

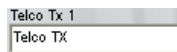
With the **Channel** tab selected on the **Tab Bar**, select the **Telco Tx** channel on the **Tree View** tab in the **Site Pane**.



As shown above, the **Center Pane** displays a signal flow diagram for the telco tx channel, real-time peak-level meters, as well as the channel routing matrix, which shows the audio routing configuration for the channel. Configuration settings for the telco tx channel are displayed as controls (buttons, sliders, etc.) which are located at the appropriate stage in the signal flow.

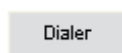
The following sections describe how to use these controls to configure telco transmit settings for your installation.

Channel Label



Rename the channel by entering a name in the **Label** entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

Dialer Button



The **Dialer** button opens the telephone dialer (shown below), allowing you to place calls to establish a conference call with a remote location.



See **Dialer** for more information on using the dialer and its features .

NOM (Number of Open Mics/Constant Level)



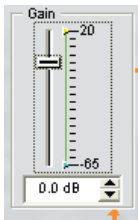
Maintains a constant output level by automatically adjusting gain levels based on the number of mics gated on and routed to the selected output channel. NOM reduces the output level proportionally by 3dB for every doubling in the number of open mics. When using NOM over the expansion bus, only the first four audio channels (O, P, Q, and R) support passing NOM information. The default is On.

Mute Button



Clicking the **Mute** button toggles muting. The default is Off.

Gain Slider

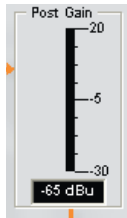


The **Gain** slider adjusts the output gain level. To change the value, use the slider or selector box. Range is from -65 to +20dB in .5dB increments. The default is 0dB.

Min/Max Limits

Use the yellow and green upper and lower limit arrows on the **Gain Scale** in the **Gain** section of the screen to set minimum and maximum gain level limits. These limits only apply when using relative gain commands; absolute gain commands can exceed the min and max limits. Min/Max limits apply to all serially connected control devices and prevent users from adjusting levels beyond the min/max levels.

Post-Gain Meter



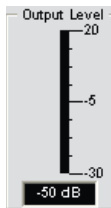
The **Post Gain** level meter displays the post-gain signal level in dB.

Limiter



The **Limiter** limits the output level to the telco side to comply with telco system requirements. Note that the meter is only a graphic; it does not show limiter activity.

Output Level Meter



Shows the signal level in dB when a signal is present.

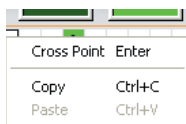
Channel Routing Matrix: Telco Tx

The graphic below shows the Telco Tx channel routing matrix.

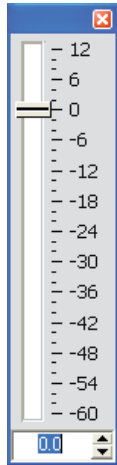
	Input 1	Input 2	Input 3	Input 4	Input 5	Input 6	Input 7	Input 8	Telco Bx	From Exp. O	From Exp. P	From Exp. Q	From Exp. R	From Exp. S	From Exp. T	From Exp. U	From Exp. V	From Exp. W	From Exp. X	From Exp. Y	From Exp. Z	Process A	Process B	Process C	Process D	Filter 1	Filter 2	Filter 3	Filter 4
Telco Tx	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

All inputs from **Exp. O**, and from **Exp. S** are selected as cross points and the first four inputs are gated by default. Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a colored box. The dB level for set cross points is shown numerically in the box.

To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu.



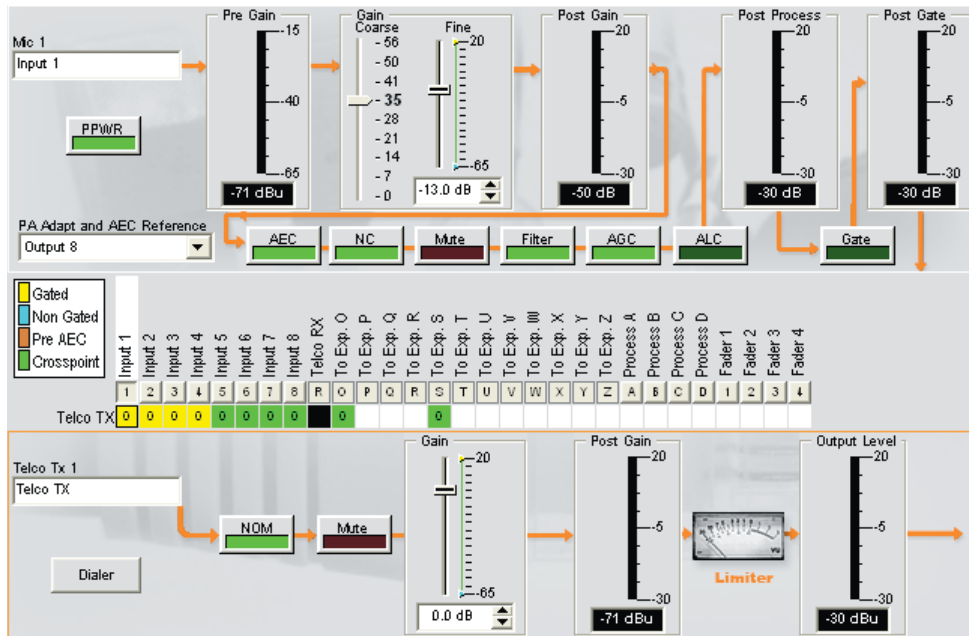
The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

Channel Routing Matrix: Inputs, Processing, Faders

In the channel routing matrix, pressing the button above an **Input**, **Process**, or **Fader** cross point box displays the signal flow diagram and configuration controls for the channel as shown below.



This display is identical to that shown in **Channel** when the channel is selected in the **Tree View** pane. See **Mic Input Settings**, **Line Input Settings**, **Processing Settings**, and **Fader Settings** for more information.

You can change the label (name) of the channel in the **Telco Tx** entry box, toggle the **NOM** button to turn constant gain mode on or off, toggle the **Mute** button to mute or un-mute the channel, and use the **Gain** slider to set the gain level for the channel. The **Output Level** meter shows the level for the channel in real time.

NOTE: Changes to channel configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from "Input 1" to "Podium Mic" in the Mic 1 entry box changes the name of the channel in the Tree View pane, and everywhere else the label appears in Console.

Creating Channel Objects

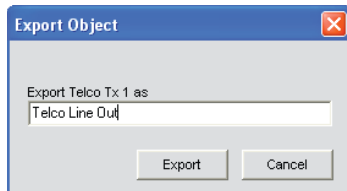
One of the most powerful features of the Console software is the ability to create Channel Objects. Channel objects capture all settings for the channel at the time the object is created. After configuring an input using the Channel tab as described in this topic, you can save it into the Database, and use drag and drop configuration to streamline configuration tasks.

To save an input channel configuration, right click in the **Channel** screen (anywhere above the channel routing matrix). From the menu that appears, select **Export Object** as shown below.



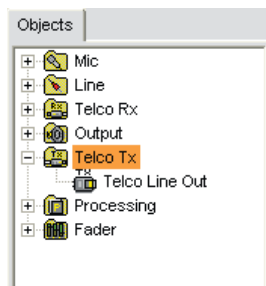
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen.

Console saves the object to the database and displays it in the **Object Tree** as shown below.



For more information on using audio devices and channel objects, see the following topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

Optimizing Output Gain Structure

Optimizing gain structure for output channels ensures optimal audio performance. When initially configuring output channels, ClearOne recommends that you follow the procedures outlined in the *Optimizing Gain Structure* topic.

For more information, refer to the *Table of Contents* for these related topics:

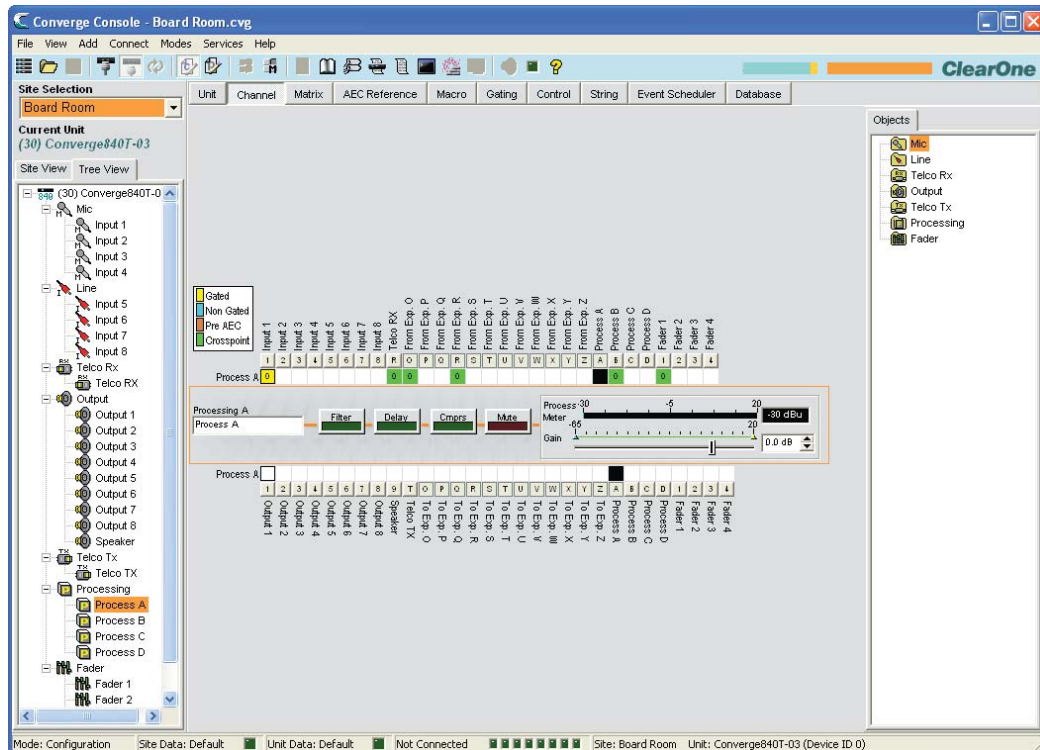
- **Channel Tab Overview**
- **Mic Gating**
- **Gating Tab**
- **Line Input Settings**
- **Mic Input Settings**
- **Processing Settings**
- **Fader Settings**
- **Telco Rx Settings (840T and TH20)**
- **Optimizing Gain Structure**

PROCESSING SETTINGS

Processing Settings enable you to configure filters, delay, compression, and gain to create precise audio configurations for any venue. There are four processing blocks available for the 840T and eight for the 880 and 8i (A-D for 840T, A-H for 880 and 8i).

Accessing Processing Settings

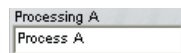
With the **Channel** tab selected on the **Tab Bar**, select the desired processing block on the **Tree View** tab in the **Site Pane**.



The center pane displays a signal processing diagram, meters, and configuration controls for selected processing block as shown above.

The meters and configuration controls for processing blocks are explained in the following sections.

Channel Label

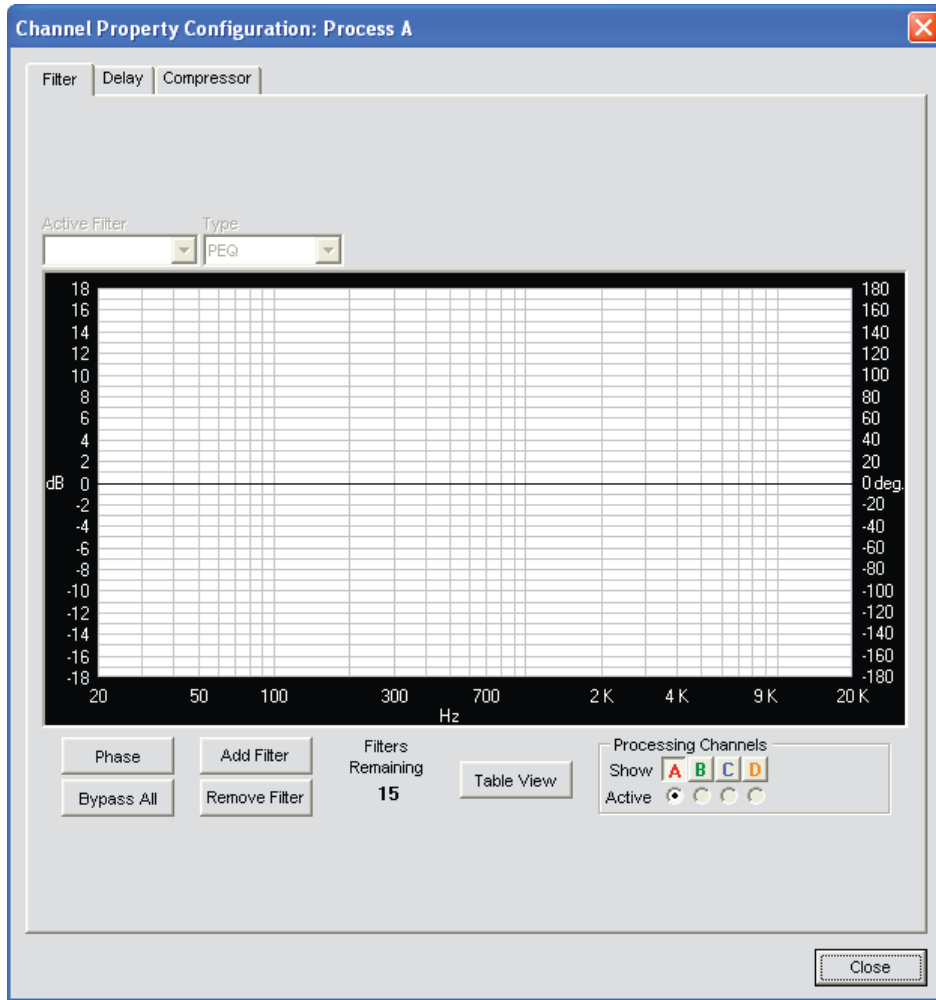


Rename the channel by entering a name in the Label entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

Filter Button



Pressing the **Filter** button brings up the **Channel Property Configuration** window with the **Filter Tab** selected as shown below.

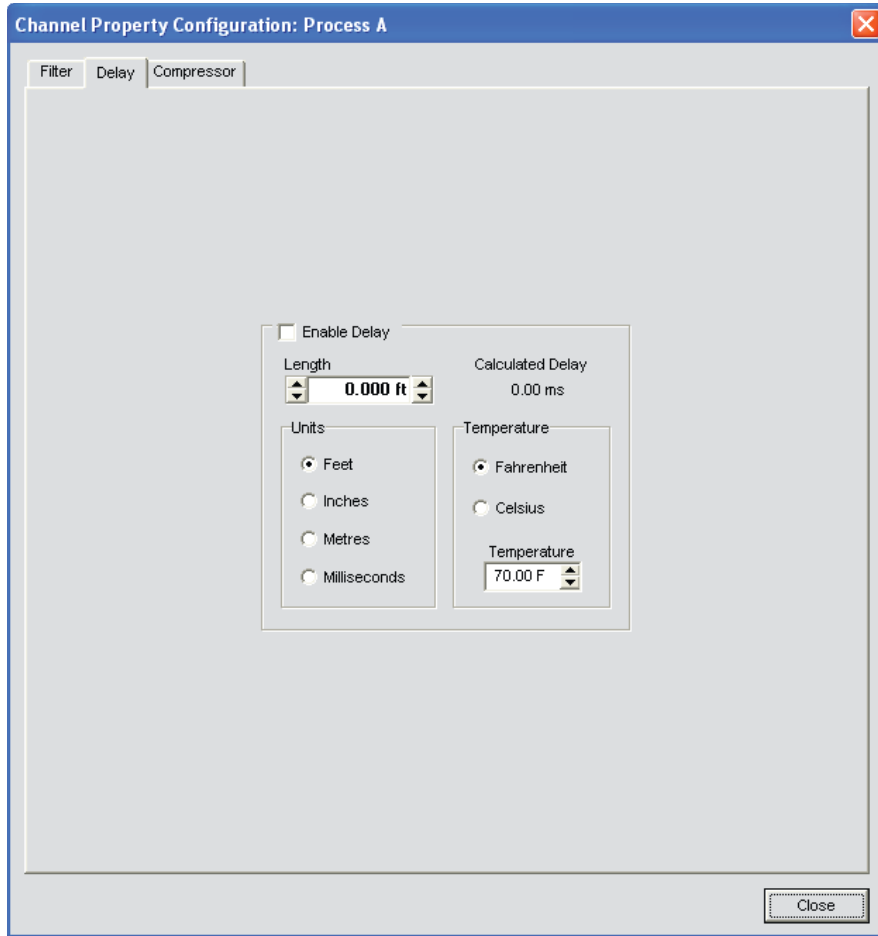


For more information on Filters and their configuration, use the *Table of Contents* to locate the *Filters* topic.

Delay Button



Pressing the **Delay** button brings up the **Channel Property Configuration** window with the **Delay Tab** selected as shown below.



Introducing an appropriate amount of delay to the forward-mounted driver(s) re-establishes the acoustical alignment necessary for proper sound imaging in a room. The same principle of introducing delay applies to separate speaker enclosures located various distances from the listening area.

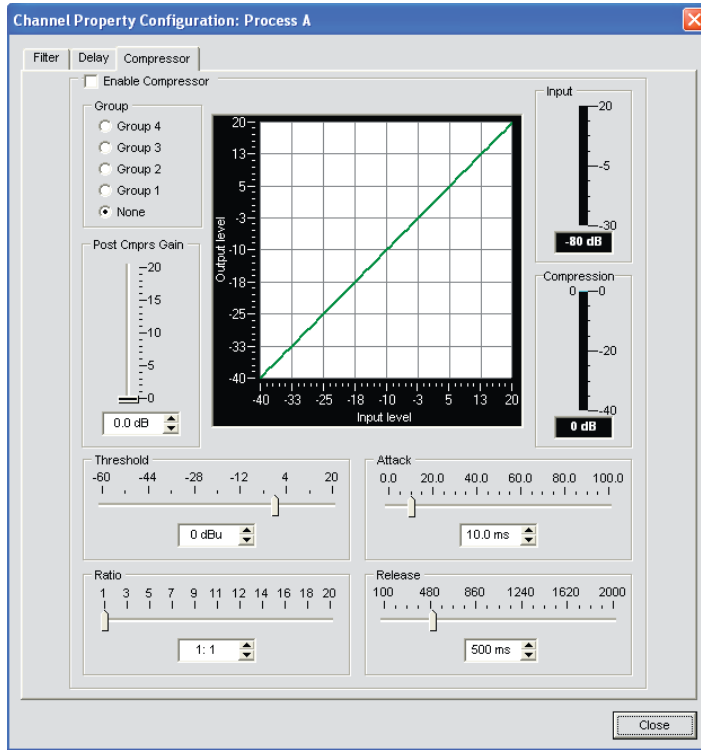
Other types of delay to consider when establishing delay parameters are delays which occur naturally as a result of processing within the Converge Pro unit. Propagation delay is an example. This delay is caused by operations such as the conversion of the signal between analog and digital formats.

Select the **Enable Delay** checkbox to enable it. Calibrate the amount of delay using the **Length** and **Temperature** configuration controls. **Length** is defined as the distance between the source and audience. The **Calculated Delay** reading reflects any changes you make in the **Distance** and **Temperature** fields.

Click **Close** to save changes and return to the **Process/Channel** window.

Cmprs (Compression) Button

Pressing the **Cmprs** button opens the **Channel Property Configuration** window with the **Compressor** tab selected as shown below.



Select the **Enable Compressor** checkbox to activate the compressor. Using the compressor, you can change the gain transfer characteristics of the signal path and control the dynamics of a signal. Compressor settings are described below.

Group

Use the **Group** radio buttons to assign this compressor to a compressor group. The default is None. When you assign a compressor to a compressor group—such as a group of two compressors configured for left and right stereo channels—the compressors will monitor each other. When one channel compresses, all compressors in the group compress together.

A compressor group must be configured for a single Converge Pro unit; a group cannot control compressors from multiple units.

Post Compressor Gain

Adjust the compressor gain with the slider or by using the **Up/Down** arrow buttons. The graph reflects the input/output decibel levels with the gain, ratio, and threshold settings you select.

Threshold

Determines the RMS level at which the compressor begins to operate. The range is from -30 to +20dBu. The default is 0dBu.

Ratio

Changes the rate of compression applied to the input signal as the signal exceeds the threshold level. The range is 1:1 to 1:20dB. The default is 1:1.

Attack

Sets the time increment used to reduce the signal from input level to the prescribed output level when the threshold is exceeded. The range is 0 to 100ms in .5ms steps. The default is 10ms.

Release

Sets the time increment used to restore the signal to the input level when the signal drops below the threshold. The range is 100ms to 2 seconds, in 5ms increments. The default is 500ms.

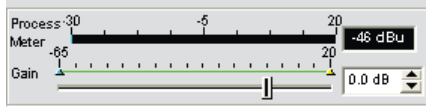
Input Meter

Shows the level of the signal as it enters the compressor.

Compression Meter

Shows the instantaneous compression value at a given time.

Gain Slider & Process Meter



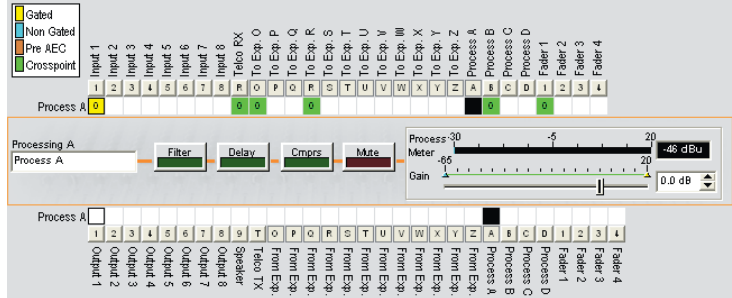
Use the **Gain Slider** to establish the gain level for this processing channel. Range is -65 to 20dB. The **Process Meter** shows the signal level when a signal is present.

Min/Max Limits

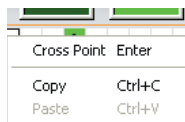
Use the yellow and green upper and lower limit arrows on the **Gain Scale** to set minimum and maximum gain level limits. These limits only apply when using relative gain commands; absolute gain commands can exceed the min and max limits. Min/Max limits apply to all serially connected control devices and prevent users from adjusting levels beyond the min/max levels, provided relative gain commands are used.

Channel Routing Matrix

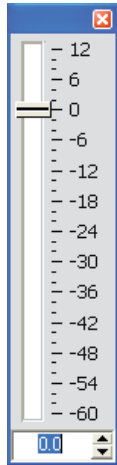
The channel routing matrix shows the Matrix row and audio routing configuration for the selected channel (Process A in this case). Clicking a cross point box selects it, clicking a second time sets the cross point, as indicated by a colored box. The dB level for set cross points is shown numerically in the box.



You can click directly on any cross point box to set a cross point, or leave it blank, as required for your installation. To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu.



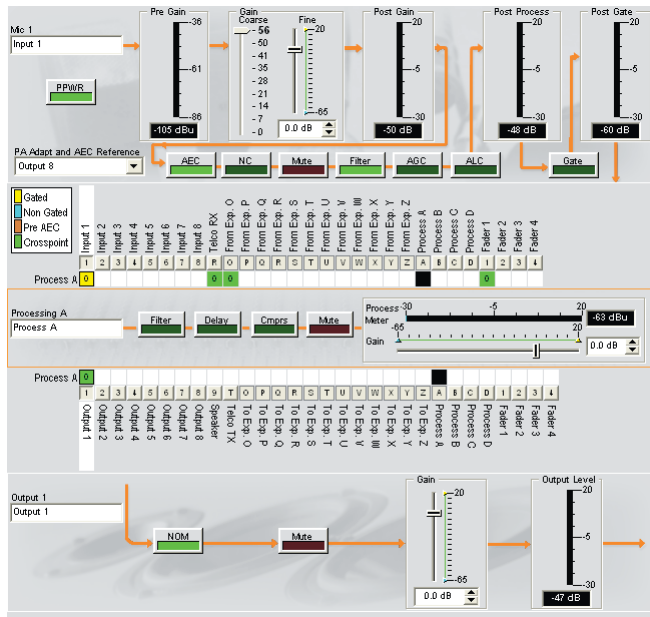
The **Cross Point Attenuation** slider appears as shown below. Move the slider or use the selector box to set the gain/attenuating level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

Expanded Channel Routing Matrix

In the channel routing matrix, pressing the button above or below the cross point box for a channel displays the signal flow diagram and configuration controls for that channel as shown below.



This display is identical to that shown in Channel when the channel is selected in the Tree View pane.

You can change the label (name) of the channel in the label entry box. You can also change channel configuration settings. For example, for an output channel you can toggle the NOM button to turn constant gain mode on or off, toggle the Mute button, and use the Gain slider to set the gain level for the channel.

NOTE: Changes to configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from **"Input 1"** to **"Podium Mic"** changes the name of the channel in the Tree View pane, and everywhere else the label appears in Console.

Creating Channel Objects

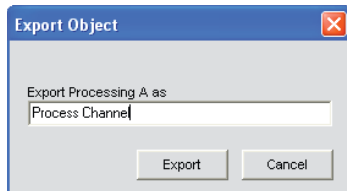
One of the most powerful features of the Console software is the ability to create Channel Objects. Channel objects capture all settings for the channel at the time the object is created. After configuring a processing channel using the Channel tab as described in this topic, you can save it into the Database, and use drag and drop configuration to streamline configuration tasks.

To save a processing channel configuration, right click in the processing section of the screen (surrounded by an orange rectangle). From the menu that appears, select **Export Object** as shown below.



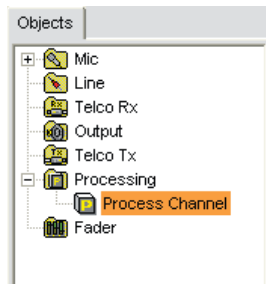
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen.

Console saves the object to the database and displays it in the **Object Tree** as shown below.



For more information on using AV devices and channel objects, see the following topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

For more information, refer to the *Table of Contents* for these related topics:

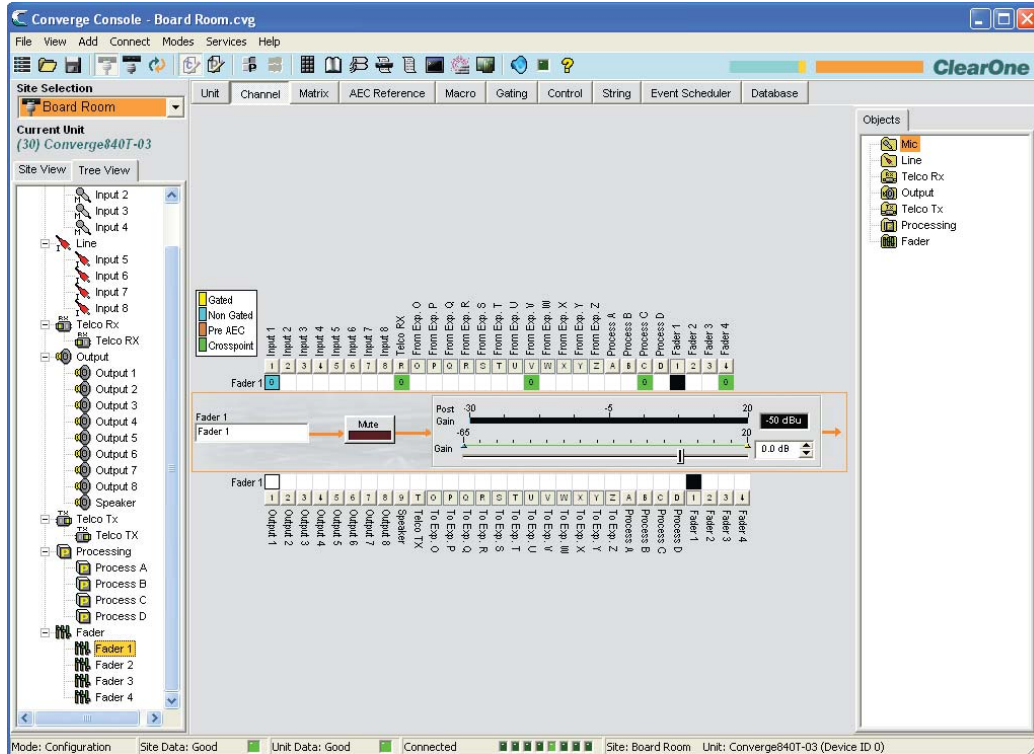
- **Channel Tab Overview**
- **Filters**
- **Line Input Settings**
- **Mic Input Settings**
- **Output Settings**
- **Processing Settings**
- **Fader Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Drag & Drop Configuration**

FADER SETTINGS

Fader Settings allow you to set configuration parameters for fader channels using the Channel tab. Fader channels are internal sub-bus channels similar to Processing channels that provide additional sub-bus mixes to control volume settings within a site.

Accessing Fader Settings

With the **Channel** tab selected on the **Tab Bar**, select the desired fader channel on the **Tree View** tab in the **Site Pane**.



As shown above, the **Center Pane** displays the configuration controls and gating for the selected Fader channel. Fader configuration controls are described in the following sections.

Channel Label



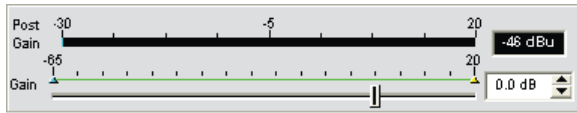
Rename the channel by entering a name in the **Label** entry field (optional). Label changes are global, and appear throughout Console wherever the label is referenced.

Mute Button



Clicking the **Mute** button toggles muting. The default is Off.

Gain Slider & Post Gain Meter



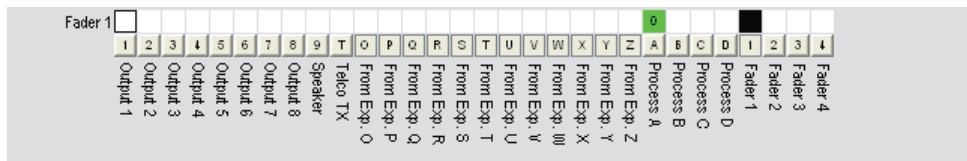
Adjusts output gain level. Use the **Gain** slider to adjust output volume level. You can also enter the level directly in the selector box. The **Post Gain** meter reflects the post-gain level of the signal in dB.

Min/Max Limits

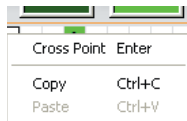
Use the yellow and green upper and lower limit arrows on the **Gain** scale to create minimum and maximum gain level limits. These limits only apply when using relative gain commands; absolute gain commands can exceed the min and max limits. **Min/Max** limits apply to all serially connected control devices and prevent users from adjusting levels beyond the min/max levels.

Channel Routing Matrix: Faders

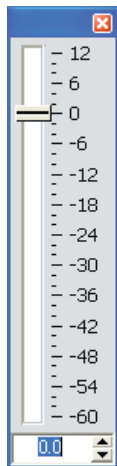
The channel routing matrix shows the **Matrix** row and audio routing configuration for the selected channel (Fader 1 in this case). Clicking a cross point box selects it, clicking it a second time sets the cross point, as indicated by a green box. The dB level for set cross points is shown numerically in the box.



You can click directly on any cross point box to set a cross point, or leave it blank, as required for your installation.



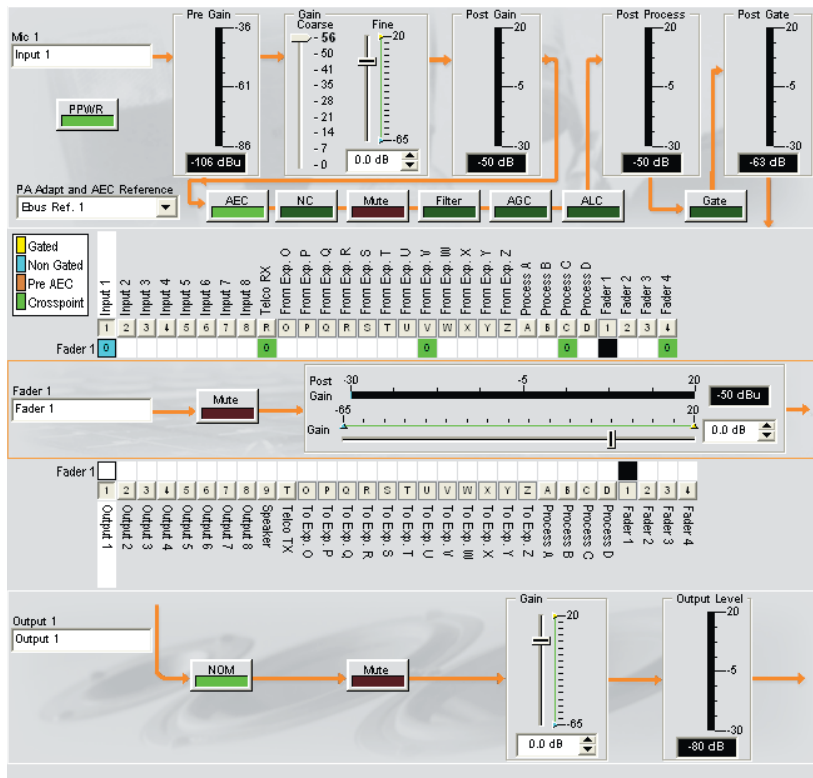
To adjust cross point gain/attenuation, right-click on a cross point box and select **Cross Point** from the shortcut menu.



The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.

NOTE: Your changes are automatically saved when you close the slider.

Expanded Channel Routing Matrix



This display is identical to that shown on the Channel tab when the channel is selected in the Tree View pane.

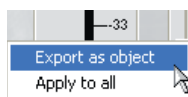
You can change the label (name) of the channel in the label entry box. You can also change channel configuration settings. For example, for an output channel you can toggle the **NOM** button to turn constant gain mode on or off, toggle the **Mute** button, and use the **Gain** slider to set the gain level for the channel.

NOTE: Changes to channel configuration settings made in the channel routing matrix apply globally to that channel. For example, changing the label (name) from “**Output 1**” to “**Ceiling Speakers**” changes the name of the channel in the Tree View pane, and everywhere else the label appears in Console.

Creating Channel Objects

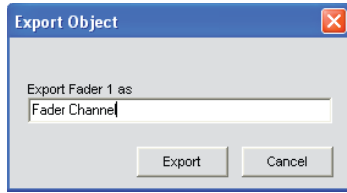
One of the most powerful features of the Console software is the ability to create Channel Objects. Channel objects capture all settings for the channel at the time the object is created. After configuring a fader channel using the Channel tab as described in this topic, you can save it into the Database, and use drag and drop configuration to streamline configuration tasks.

To save a fader channel configuration, right click in the fader section of the screen (surrounded by an orange rectangle). From the menu that appears, select **Export Object** as shown below.



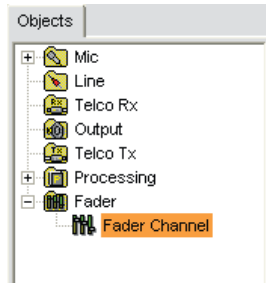
NOTE: You can apply the channel configurations for the current channel to all channels of the same type by selecting the **Apply to all** option. Use this option with caution because there is no way to undo the changes.

Enter an appropriate **Label** (name) in the entry field of **Export Object** dialog as shown below.



Click **Export** to save the configuration to the database, or **Cancel** to return to the Channel screen.

Console saves the object to the database and displays it in the **Object Tree** as shown below.



For more information on using AV devices and channel objects, see the following topics:

- **AV Devices**
- **Creating AV Devices**
- **Channel Objects**
- **Database Tab**
- **Drag & Drop Configuration**

For more information, refer to the *Table of Contents* for these related topics:

- **Channel Tab Overview**
- **Filters**
- **Line Input Settings**
- **Mic Input Settings**
- **Output Settings**
- **Processing Settings**
- **Fader Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Drag & Drop Configuration**

MATRIX TAB

The **Matrix Tab** is used to route audio to one or more destinations (outputs, expansion bus, processing, or fader channels) and to create cross points between channels.

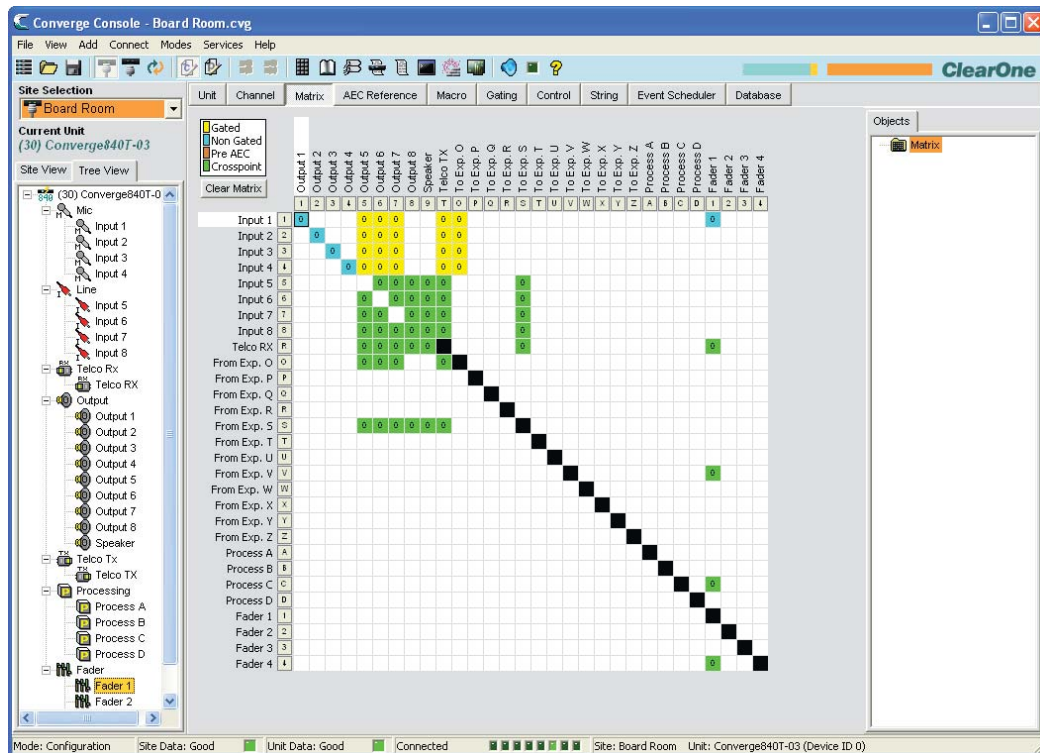
Any number of input-to-output connections can be made in the matrix, with level control at each cross point. Any input or combination of inputs can be routed to any output or combination of outputs. The channels available in routing matrix for each Converge Pro model are summarized below:

- **Converge Pro 840T:** 25 inputs x 26 outputs
- **Converge Pro 880:** 36 inputs x 36 outputs
- **Converge Pro 8i:** 36 inputs x 28 outputs
- **Converge Pro TH20:** 15 inputs x 15 outputs

For more information on connecting input and output devices, see *Controls and Connections*.

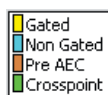
Accessing the Matrix

To access the matrix, select the **Matrix Tab** from the **Tab Bar** in Console.



The matrix appears with the current routing configuration displayed for all channels. The functionality of the matrix screen is described in the following sections.

Routing Legend



Shows the status of cross points using colored cells that mark the intersection or cross point of the routing from input to output.

The color of the cross point cell identifies the input type:

- **Yellow** = gated mic input
- **Blue** = non-gated mic input
- **Brown** = pre-AEC
- **Green** = cross point

NOTE: The current audio level to the nearest dB is shown in cross point cells.

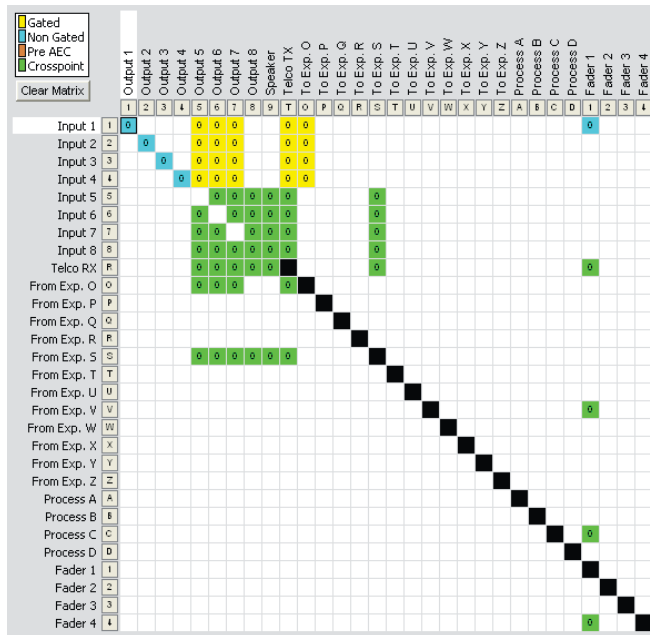
Black cell are restricted routing paths which prevent Telco, E-Bus, Processing, and Fader channels from being routed back to themselves.

Clear Matrix Button



Press the **Clear Matrix** button to clear ALL current matrix settings. A **Confirm** dialog appears asking you to confirm the clear matrix operation. Use caution when using this feature because the operation cannot be undone.

Audio Routing Matrix



The numbers and letters along the top and left side of the matrix show the cross point coordinates. The Labels for each channel are also shown to make them easy to identify. As you move the cursor over the matrix, the labels for the channels are highlighted in white for each cross point.

NOTE: Clicking on a channel label opens the Channel screen for that channel, allowing you to modify the channel label and change channel configuration settings as needed.

Input Routing

To route an input to an output, click in the routing matrix at the intersection between the input and the output. A mic input can be designated as gated (yellow), non-gated (blue), or pre-AEC (brown) by clicking repeatedly in the cross point. All other input cross points will be colored green.

Expansion Bus O-Z Routing

Audio on any Converge Pro unit in the E-bus network can be placed on the bus or taken off the bus and routed to any destination within the unit.

All Converge Pro devices have 12 digital mix-minus buses:

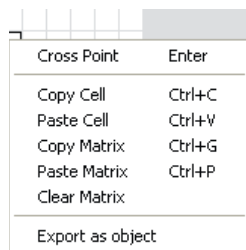
- **O–R** buses are defaulted as the mic mix buses and can communicate the **NOM** count. Gated mics are routed to the O-bus by default.
- **S–Z** buses are defaulted as the auxiliary mix buses. They are used to carry auxiliary audio such as that from codecs and Converge Pro TH20s. These buses are used as mic-mix buses when NOM count is not required.

Process A–D (840T) and Process A–H (880 and 8i) Routing

There are four processing channels on the Converge Pro 840T and eight on the 880 and 8i. With these processing channels, you can apply filters, compression, delay, and other processing settings to an input or a group of inputs, which can then be routed to a single output or group of outputs.

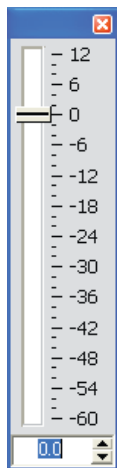
Cross Point Shortcut Menu

In addition to setting levels, the **Cross Point Shortcut Menu** (shown below) enables you to copy and paste the configuration of the current cross point to other cross points. To access the shortcut menu, right-click anywhere in the **Center Pane** of the **Matrix** screen.



Cross Point Level Control

To adjust the level for a cross point, right-click on the cross point and select **Cross Point** from the shortcut menu. The **Cross Point Attenuation** slider appears. Move the slider or use the selector box to set the gain/attenuation level in dB. The range is from -60 to 12dB in .5dB increments. The default is 0dB.



NOTE: Your changes are automatically saved when you close the slider.

The level you select now appears numerically in the cross point box within the matrix.

Copy and Paste Cells

You can copy a single cell or the entire matrix using the shortcut menu options.

To copy a cross point to multiple cross points, press **<Ctrl+C>** to copy, then press **<Ctrl+V>** while holding down the left-mouse button and dragging the mouse over the cross points to which you want to copy the settings.

Copy and Paste Matrix

To copy the entire matrix, use the shortcut menu commands; or press **<Ctrl+G>** to copy the matrix, select the unit you want to copy the matrix to in the **Site View Tab**, and press **<Ctrl+P>** to paste the matrix into the matrix screen for the selected unit.

Clear Matrix

Press the **Clear Matrix** button to clear all current matrix settings. A **Confirm** dialog appears asking you to confirm the operation. Use this option with caution because the operation cannot be undone.

Exporting Matrix Objects

Matrix objects allow you to save customized matrix configurations into the Database and reuse them. This enables you to instantly re-configure the entire matrix to accommodate changes in conferencing or venue configuration requirements, and to rapidly configure additional Converge Pro units using Drag and Drop Configuration.

To capture the current matrix configuration and save it as a matrix object, right click anywhere in the center pane of the matrix screen and select Export as object from the shortcut menu.

To apply a matrix object, drag it from the Objects Pane and drop it onto the matrix in the Matrix Tab screen.

For more information on using AV devices and objects, refer to the *Table of Contents* for these related topics:

- **Controls and Connections**
- **Channel Tab Overview**
- **Expansion Bus Overview**
- **NOM**
- **Mic Gating**
- **Filters**
- **Processing**
- **Database Tab**
- **Drag & Drop Configuration**
- **Line Input Settings**
- **Mic Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Output Settings**
- **Telco Tx Settings (840T and TH20)**
- **Fader Settings**

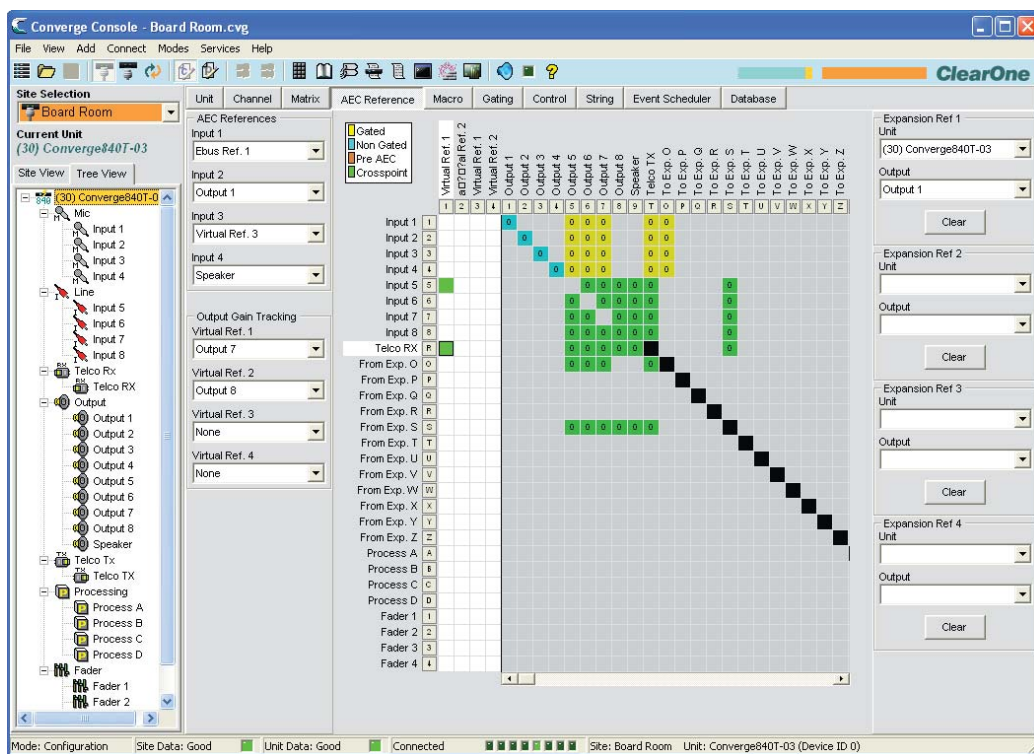
AEC REFERENCE TAB

The **AEC Reference Tab** allows you to establish reference sources for **Acoustic Echo Cancellation (AEC)**. AEC uses reference signals as the basis for acoustic echo cancellation. An AEC reference is a digital sample of the receive audio signal that is used by the AEC filter model for adaption and convergence.

You can use both unit and expansion bus audio sources as AEC references for the **Mic Inputs** connected to a unit. In addition, you can define virtual reference sources that combine multiple audio signals into a single AEC reference source. Virtual references improve AEC performance in stereo speaker and combined audio/video conferencing applications.

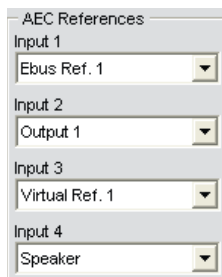
Accessing AEC Reference

To access AEC Reference, select the unit that you want to define AEC references for in the **Tree View** Tab of the **Site Pane**, then select the **AEC Reference Tab** from the **Tab Bar** in Console.



The **AEC Reference** screen appears in the center pane of Console. AEC reference configuration is explained in the following sections.

AEC References Sources

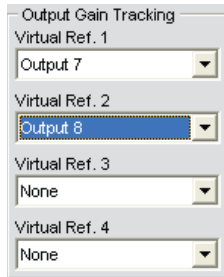


Use the drop-down lists to select an AEC reference for each input channel as required for your application. As shown above, you can select any of the following as an AEC reference source in the **AEC References** section of the screen:

- Output channels
- Expansion bus channels
- Speaker outputs (840T only)
- Virtual references

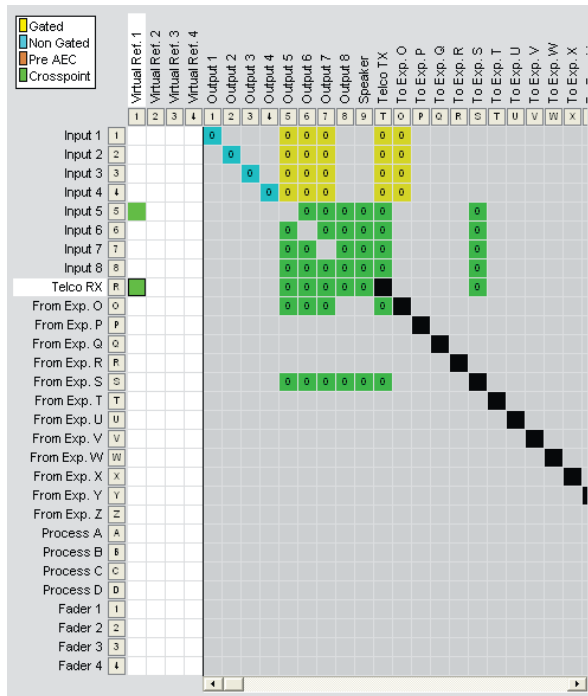
Virtual AEC References

Virtual AEC References allow you to combine multiple audio sources for applications where there are two speakers (left and right) providing audio to the far side, combined audio/video conferencing, and audio/video teleconferencing. In these and other multiple output applications, using virtual AEC references improves AEC performance.



AEC requires a physical output reference to track output gain changes. Therefore when using virtual AEC references, you must use output gain tracking to provide level information to the AEC process. Use the **Output Gain Tracking** section of the screen (shown above) to specify the level source for each virtual reference that you define.

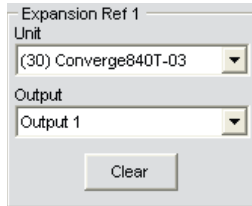
Virtual AEC reference sources are defined in a special section of the Matrix (shown below, highlighted in white):



Use the white cross point area to select the outputs for each virtual reference source you want to define. In the example above, **Output 7** is connected to the room amplifier. This audio includes microphones that cannot be included in the AEC reference, so Output 7 should not be used directly as the AEC reference source. Instead, use a Virtual Reference and route any inputs that you want cancelled to that reference. This typically would include **Telco RX** audio and audio from a video codec (**Input 5** above), which in this example are combined to create **Virtual Reference 1**.

NOTE: If the channels selected for a virtual reference use Processing or Faders, you should select the processing or fader channel as the virtual reference source. This provides the AEC process with the most accurate reference for the signal, thereby providing faster convergence and more accurate AEC performance.

Expansion Bus Reference Sources



Use the **Expansion References (1-4)** section of the screen to use audio from an expansion bus channel as the AEC reference source. For each expansion reference, select the **Unit** and the **Output** you want to use as an AEC reference using the drop-down lists.

The following types of sources are available for use as expansion AEC reference sources:

- **Output channels**
- **Speakers**
- **Virtual references**

For more information, refer to the *Table of Contents* for these related topics:

- **AEC (Acoustic Echo Cancellation)**
- **Mic Input Settings**
- **Processing Settings**
- **Fader Settings**

MACRO TAB

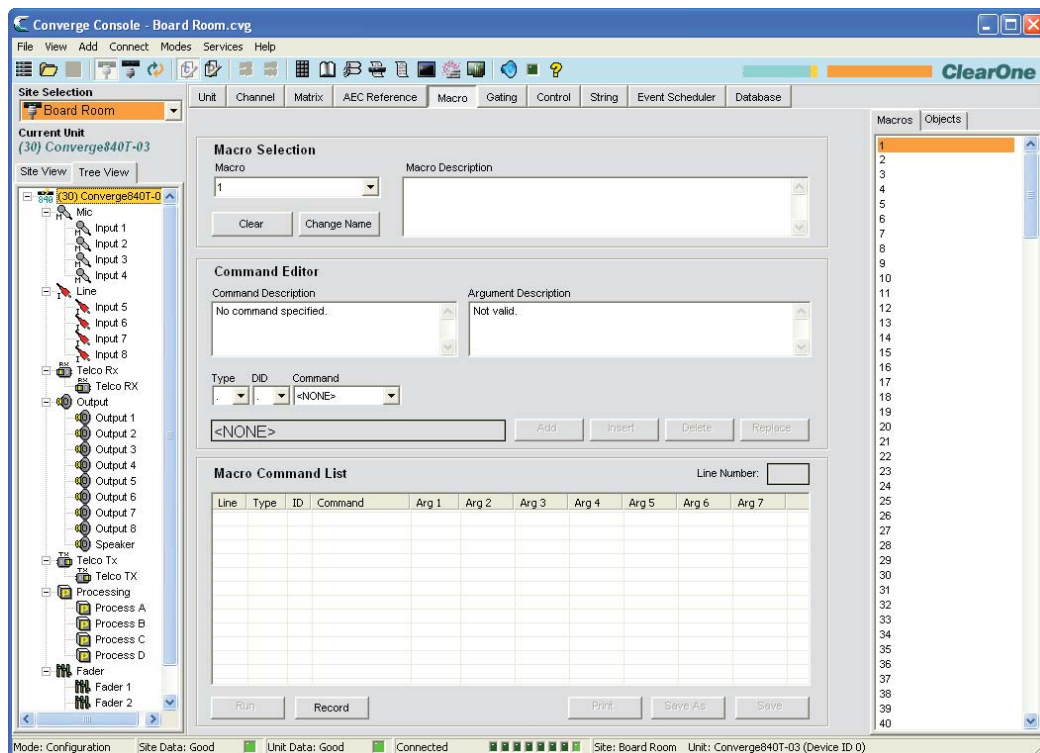
Macros define a series of commands which can be run using the Front Panel LCD, Serial Commands, Control Ports, Presets, the Converge Pro Web Portal, SNMP, and other macros.

Macros allow you to make quick configuration changes and to execute multiple Presets simultaneously. Macros can also contain commands that are executed on other Converge Pro units on the Expansion Bus.

Converge Pro supports up to 255 macros with an average of 150 command lines each. In the unlikely event that you exceed Console's memory capacity, a warning appears indicating the command line at which memory is exceeded.

Accessing Macros

To access macros, press the **Macro Tab** on the **Tab Bar** in Console.



There are two ways to create macros in Console: the Macro Recorder, which records screen selections, and the Macro Editor, which allows you to create command lines. The Macro Editor is also used to modify macros created using the Macro Recorder.

Macro Recorder

Use the following procedure to record a macro using Macro Recorder:

1. Click the **Record** button at the bottom of the Macro screen. The **Macro** dialog appears.



2. Select the macro number from the **Macro to Record** drop-down list, then click **Start**.
3. The **Macro Record** dialog appears (shown below).

4. Make the routing and input/output configuration changes (such as gain adjustments, mute, etc.) in Console that you want to include in the macro.
5. Click **Stop** in the Macro Record dialog to end macro recording.
6. The macro **Command Editor** appears with a list of the commands captured.

The screenshot shows the **Command Editor** window. At the top, there are two text boxes: **Command Description** (containing "This command selects which output or expansion bus reference is used for a Mic input as a reference for power amp") and **Argument Description** (containing "Channel 1-8 for an Converge 880, 8i and 1-4 for an 840T. Ref Group: E, O, B. Ref Channel based on Ref Group and device type: E: O-Z, O:"). Below these are several dropdown menus for **Type** (set to 1), **DID** (set to 0), **Command** (set to REFSEL), **Channel Ref Group** (set to 1), and **Ref Chnl** (set to B). A text field contains "#10 REFSEL 1 B 1". Buttons for **Add**, **Insert**, **Delete**, and **Replace** are visible. Below this is the **Macro Command List** window, which has a **Line Number** dropdown set to 1. It contains a table with the following data:

Line	Type	ID	Command	Arg 1	Arg 2	Arg 3	Arg 4	Arg 5	Arg 6	Arg 7
1	3	0	NOM	1	O	0				
2	3	0	MUTE	2	M	0				

Buttons for **Run**, **Record**, **Print**, **Save As**, and **Save** are at the bottom.

7. Click **Save** to save the macro.

You can use the Macro Editor to modify recorded macros as described in the next section.

Macro Editor

Creating Macros

Use the following procedure to create a macro using the Macro Editor:

1. Select the Macro number to create from the **Macro** drop-down list.

The screenshot shows the **Macro Selection** dialog box. It has a **Macro** dropdown menu with the value 2 selected. Below it are **Clear** and **Change Name** buttons. To the right is a large text area for **Macro Description**.

NOTE: Used macros are indicated by an asterisk in the macro drop-down list.

2. Press **Change Name** to assign a name to the macro (optional). Enter the name into the **Change Name** dialog that appears.

NOTE: Macro names appear in Console macro lists and on the LCD Macro menu. Using brief descriptive names makes it easier to identify a macro's functionality.

3. Enter a description of the macro's functionality in the **Macro Description** entry field (optional).
4. Select the Converge Pro device **Type**, **DID** (Device ID number), and **Command** from the drop-down lists.
5. When you select a command, a description of it appears in the **Command Description** box. The parameters associated with the command also appear, along with the valid values or range for each parameter, in the **Argument Description** box (shown below).
6. Set the parameter values for the command as required (optional).

Command Editor

Command Description: Sets the gain for an Input, Output, Processor, Telco Rx, or Telco Tx.

Argument Description: Channel/Group: F - Faders; I - Inputs; L - Line Inputs; M - Microphone Inputs; O - Outputs; P - Processing; R - Telco Rx; T - Telco Tx

Type	DID	Command	Channel Group	Rate	Target
1	0	RAMP	1	F	-50

#10 RAMP 1 F -50 -20.0

Buttons: Add, Insert, Delete, Replace

- Click **Add** to add the command to the end of the macro, or **Insert** to insert the command before the currently selected row of the macro. The command appears in the **Macro Command List**.

Macro Command List Line Number: 1

Line	Type	ID	Command	Arg 1	Arg 2	Arg 3	Arg 4	Arg 5	Arg 6	Arg 7
1	1	0	RAMP	1	F	-3	-20			

Buttons: Run, Record, Print, Save As, Save

NOTE: When there are multiple commands in the Macro Command List, you can drag and drop them to change their execution order.

You can now add another command (repeat steps 4 through 6), or click **Save** or **Save As** to save the completed macro.

Modifying Macros

Use the following procedure to edit a macro:

- Select the Macro number to modify from the **Macro** drop-down list.
- Click **Change Name** to change the macro name (optional).
- Double-click the command line in the **Macro Command List** you want to edit.
- Modify the command or its arguments by selecting options from the drop-down lists.
- Click **Replace** to overwrite the old command line with the new changes.
- Click **Insert** to insert a new command, or **Delete** to delete the currently highlighted command.
- When you are finished making changes, click **Save** or **Save As** to save the macro.

Deleting Macros

Use the following procedure to delete a macro:

- Click **Clear Macro** to delete the entire macro.
- Click **Delete** to delete the selected command line.

Adding and Inserting Command Lines


Use the following procedure to add or insert command lines into the currently selected macro:

- Click **Add** to place the current command line into the next available row in the command line table.
- Click **Insert** to insert the current command line into the row directly above the currently selected command line in the table.
- When you are finished making changes, click **Save** or **Save As** to save the macro.

Running Macros

Running Macros Using Console

Use the following procedure to run a Macro from the Console software:

1. Select the **Macro** tab from the Console main screen or press the **Run Macro**  button on the button bar (only available when Console is in Configuration mode).
2. Select the macro from the Select Macro list.
3. Click **Run** to run the macro and close the window.

Running Macros Using the Front Panel

Use the following procedure to run a macro from the front panel:

1. Using the **Menu Dial**, select the **Macros Menu**.
2. Select the macro you want to run from list and press the **Select** button.
3. Answer **Yes** when prompted to run the macro, or **No** to cancel.

Running Macros Using Control Devices

Refer to the *Control Tab* topic for information on running macros using control devices.

Exporting Macro Objects

Macro Objects allow you to save macros into the **Database** and reuse them. To capture a macro and save it as an object, right click anywhere in the center pane of the macro screen and select **Export as object** from the shortcut menu.

For more information about objects, see **Creating Channel Objects, Matrix Objects, Control Objects, and Drag & Drop Configuration**.

For additional information, refer to the *Table of Contents* for these related topics:

- **Controls and Connections**
- **Expansion Bus Overview**
- **Device IDs**
- **LCD Programming Overview**
- **LCD Macros Menu**
- **Presets**
- **Configuration Mode**
- **Control Tab**
- **Database**
- **Channel Objects**
- **Matrix Objects**
- **Control Objects**
- **Drag & Drop Configuration**

GATING TAB

The **Gating** tab allows you to create gating groups and assign mic inputs to gating groups.

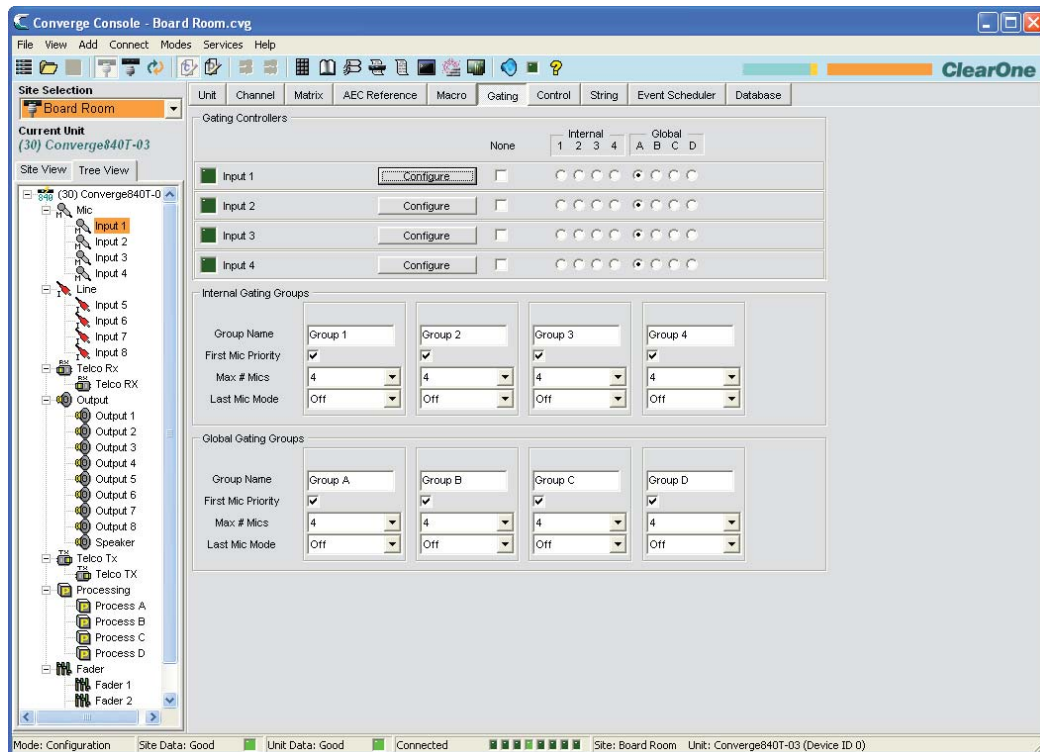
Gating group assignments combine individual channel gating configurations created using the **Channel Properties Configuration** screen. When inputs are assigned to a gating group, the gating information from the assigned inputs is used to control how the entire mixer behaves.

The Converge Pro product family (excluding the TH20) feature four internal gating groups (**Internal 1–4**), and four global gating groups across the expansion bus (**Global A–D**). Mic inputs are assigned to **Global Group A** by default. If an input is not assigned to a gating group, that mic's gating properties are independent, and they have no effect on any gating group. When gating groups span two or more units (global gating groups), the settings must be the same for each unit attached to the global gating group.

NOTE: Mic inputs can be assigned to one and only one Gating Group at a time.

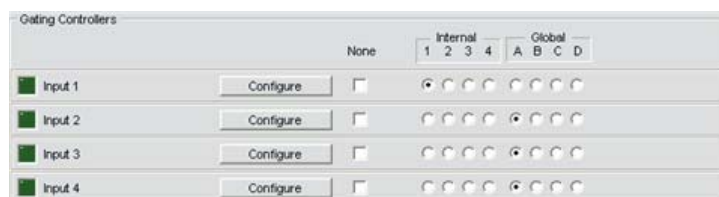
Accessing Gating Groups

To access gating groups, click the **Gating Tab** on the **Tab Bar** in Console.



Gating configurations are shown in the **Center Pane**. The following sections describe how to configure gating groups.

Gating Controllers



Use the **Gating Controllers** section of the screen to assign **Mic Inputs** to a gating group. Use **Internal** gating

groups (radio buttons **1-4**) to control mic inputs connected to the unit currently selected in the **Site Pane**. Use **Global** gating groups (radio buttons **A-D**) to control mic inputs connected to the current unit, as well as all units connected to the E-Bus.

Press the **Configure** button to display and modify individual channel **Gating** configurations using the **Channel Properties Configuration** screen.

Internal Gating Groups

	Group 1	Group 2	Group 3	Group 4
Group Name	Group 1	Group 2	Group 3	Group 4
First Mic Priority	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Max # Mics	4	4	4	4
Last Mic Mode	Off	Off	Off	Off

Internal gating groups control mic inputs connected to a specific Converge Pro unit. Configure Internal Gating Group settings as follows:

- Enter a name in the **Group Name** field (optional).
- Select the **First Mic Priority** checkbox to enable this feature (default), or deselect it to turn First Mic Priority off.

NOTE: ClearOne recommends using First Mic Priority to maintain maximum audio intelligibility by allowing only one mic to gate on to a participant's voice. First Mic Priority allows more than one microphone to gate on at same time, but it restricts more than one mic from gating on to the same audio source. It does this by determining the audio level received by all mics when the first mic is gated on, and then using this audio level as the ambient level for the gating group. If First Mic Priority is disabled, two or more microphones will usually gate on when only one person speaks.

- Select the **Max # of Mics** from the drop-down list (the default is 4). This sets the maximum number of microphones that can be gated on at any one time within a gating group. The maximum number of mics is limited to the number of mics included in the gating group. For internal gating groups, the maximum number of mics is 8 for Converge Pro 880 and 8i units, and 4 for 840T units.
- Select the **Last Mic Mode** from the drop-down list (the default is off). **Last On** leaves the last mic activated gated on until another mic gates on. The **Input** options allow you to select which mic remains on when all other mics gate off. **Off** gates all mics off when no audio is present. **All** allows all mics to gate on at the same time.

Global Gating Groups

	Group A	Group B	Group C	Group D
Group Name	Group A	Group B	Group C	Group D
First Mic Priority	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Max # Mics	4	4	4	4
Last Mic Mode	Off	Off	Off	Off

Global gating groups control mic inputs connected to all units linked together through the **Expansion Bus**. Configure **Global Gating Group** settings as follows:

- Enter a name in the **Group Name** field (optional).
- Select the **First Mic Priority** checkbox to enable this feature (default), or deselect it to turn First Mic Priority off.

NOTE: ClearOne recommends using First Mic Priority to maintain maximum audio intelligibility by allowing only one mic to gate on to a participant's voice. First Mic Priority allows more than one microphone to gate on at same time, but it restricts more than one mic from

gating on to the same audio source. It does this by determining the audio level received by all mics when the first mic is gated on, and then using this audio level as the ambient level for the gating group. If First Mic Priority is disabled, two or more microphones will usually gate on when only one person speaks.

- Select the **Max # of Mics** from the drop-down list (the default is 4). This sets the maximum number of microphones that can be gated on at any one time within a gating group. Again, the maximum number of mics is limited to the number of mics included in the gating group. For global gating groups, the maximum number of mics is 8 for Converge Pro 880 and 8i units, and 4 for 840T units, up to a total of 64 mics in E-bus linked systems.
- Select the **Last Mic Mode** from the drop-down list (the default is off). **Last On** leaves the last mic activated gated on until another mic gates on. The **Input** options allow you to select which mic remains on when all other mics gate off. **Off** gates all mics off when no audio is present.

For additional information, refer to the *Table of Contents* for these related topics:

- **Mic Input Settings**
- **Channel Tab Overview**
- **Mic Gating**
- **Expansion Bus Overview**

CONTROL TAB

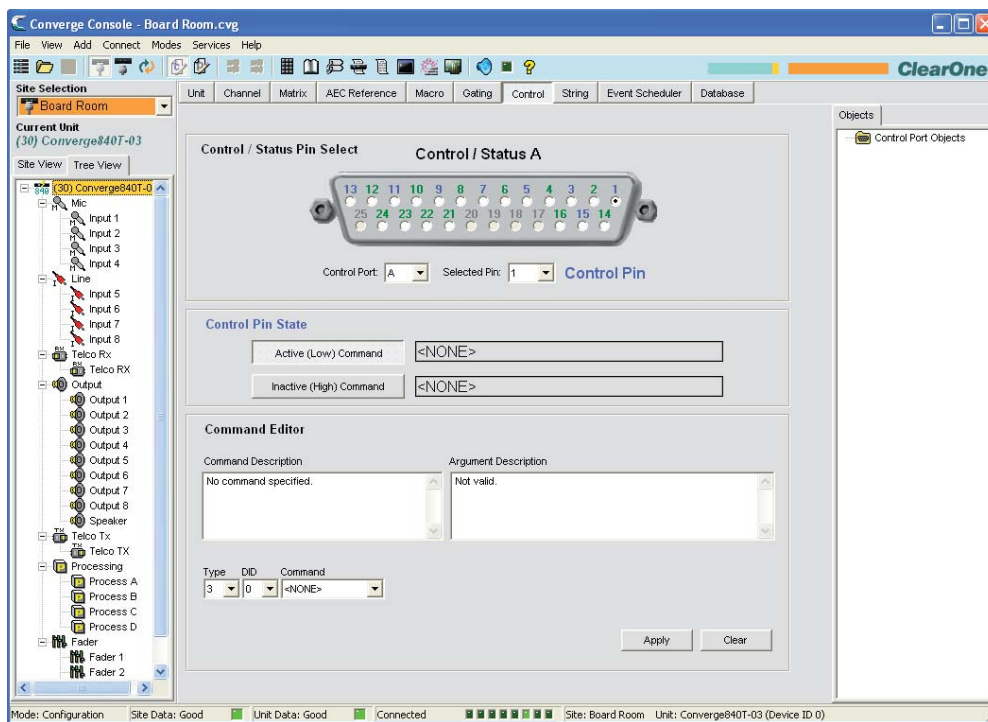
The **Control Tab** allows you to configure pin assignments for the user-definable pins on Control/Status Port A and Control/Status Port B of Converge Pro units.

Converge Pro devices implement control/status using DB-25 pin ports on the back panel, and GPIO (General Purpose Input Output) with active low/pull to ground inputs and open collector outputs. For details, refer to *Appendix B: Default Pin Assignments* and the *Control/Status Ports* section of *Appendix C: Specifications*.

The control ports enable external devices to access the Converge Pro serial command set, including common functions such as volume control, muting, room combining, and preset changes. All Converge Pro devices connected via the E-bus can be controlled from a single control/status port on any of the devices.

Accessing the Control Tab

To access command control, press the **Control Tab** on the **Tab Bar** in Console.



The **Control** tab of the Console main screen shows a graphical representation of **Control/Status Port A**. The pins numbered in blue are user-definable command pins; the pins numbered in green are status pins. Control interface functionality and pin programming are explained in the following sections.

User-Definable Pins

The user-definable pins provide control via contact closure, and status via open collector functions in the unit. There are two user-definable pins on the B port of every unit. The number of user-definable pins on the A port varies by model, as summarized in the following table:

Model	User-Definable Pins Control/Status Port A	User-Definable Pins Control/Status Port B
880	16	2
840T	20	2
8i	16	2
TH20	24	2

Default Pin Assignments

For default pin assignments for Control/Status ports by model, refer to *Appendix B: Default Pin Assignments*.

Control/Status Ports

Control/Status A and B ports are female DB25 connectors used for General Purpose Input/Output (GPIO) interactions between Converge Pro devices and external control devices such as wall switches and push-to-talk microphones. Control programming enables external control devices and controller software to access the Converge Pro serial command set, including common functions such as volume control, muting, room combining, and preset changes.

For more information on **Control/Status Port A and B**, and the other physical connections available on Converge Pro products, see **Controls and Connections**.

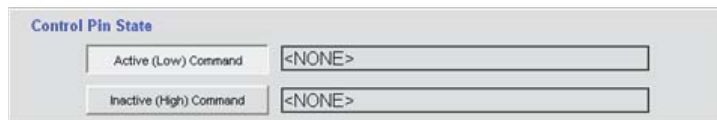
Control/Status Pin Programming

Use the following procedure to program user-definable pins:

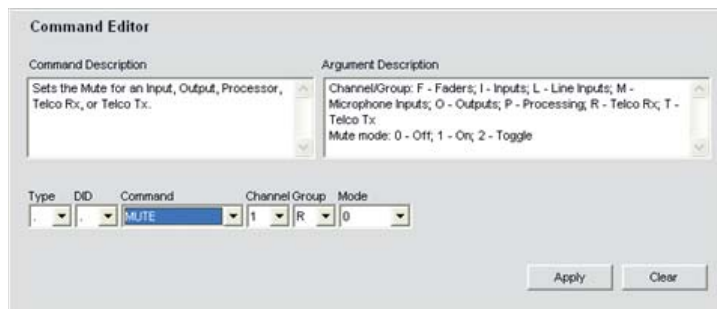
1. In the **Control/Status Pin Select** section of the screen, select port **A** or **B** from the **Control Port** drop-down list.



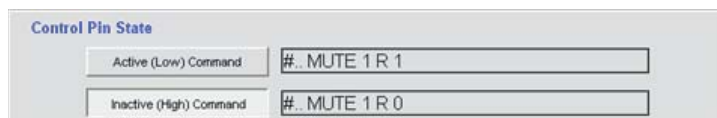
2. Select the pin you want to configure from the **Selected Pin** drop-down list. (**Pin 1** is selected by default for **Control Port A** and **Pin 21** is selected by default for **Control Port B**.)



3. In the **Control Pin State** section of the screen, press the **Active (Low) Command** or **Inactive (High) Command** button to select the pin state that you want to associate a command with.



4. In the **Command Editor** section of the screen, select the Converge Pro device **Type**, **DID**, and **Command** from the drop-down lists. When you select a command, its description appears in the **Command Description** box. The parameters associated with the command appear next to the **Command** drop-down list, and the valid values or range for each parameter appear in the **Argument Description** box.



5. Set parameter values for the command as required, then press the **Apply** button. The command appears in the selected **Active/Inactive Command** text box.
6. To complete programming for the selected pin, repeat steps 3 through 6 to set the **Active Command** for the opposite pin state.
7. Repeat steps 1 through 6 to program additional pins.

Clearing Pin Programming

To clear programming for a pin, select the **Control Port** and **Selected Pin** using the drop-down lists, select the pin state using the **Active Command** buttons, then press the **Clear** button. To clear all pins, right-click and select **Clear All** from the shortcut menu.

Exporting Control Objects

You can save control port objects into the Converge Pro database. To capture the currently displayed control pin programming, right click in the **Control/Status Pin Select** portion of the of the **Control Tab** screen, and select **Export as object** from the shortcut menu. After saving the control port object, it appears in the **Objects** pane on the right side of Console.

For more information about objects, see **Creating Channel Objects, Matrix Objects, Macro Objects, and Drag & Drop Configuration**.

For additional information, refer to the *Table of Contents* for these related topics:

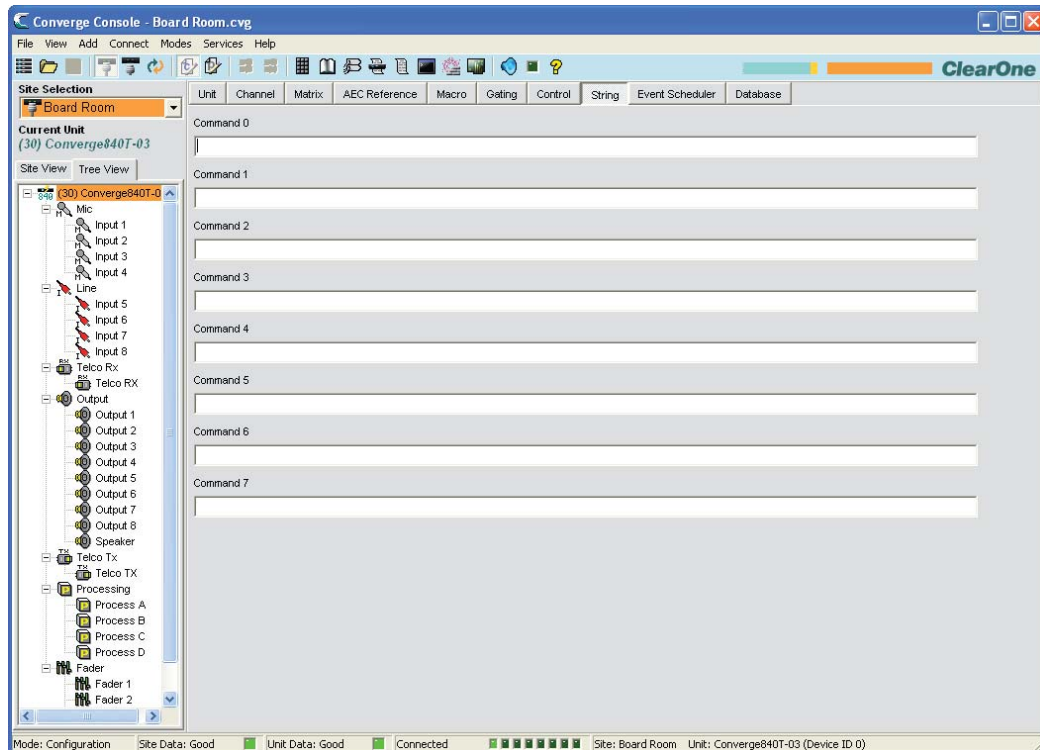
- **Expansion Bus**
- **Controls and Connections**
- **Device IDs (DIDs)**
- **String Tab**

STRING TAB

The String Tab enables you to create up to eight command strings that allow Converge Pro units to control external devices such as lighting, projectors, and room dividers. Command strings are written using the command syntax of the external device being controlled. Converge Pro devices pass command strings as literal text strings to external devices through the RS-232 Port.

Accessing the String Tab

To create command strings, press the String Tab on the Tab Bar in Console.



You can create up to eight serial command strings (limit 80 characters each) on the String screen. The following sections explain how to create and run command strings.

Command String Special Characters

The following character combinations provide basic functionality in Command String syntax:

- **\a** = alert
- **\b** = backspace
- **\f** = form feed
- **\n** = new line
- **\r** = carriage return
- **\t** = horizontal tab
- **\v** = vertical tab
- **** = backslash

Creating Command Strings

Type a command string in the **Command 0** through **Command 7** text boxes in the center pane of the **Control Tab**. Alternatively, you can copy an existing string from any source, then right-click in a **Command** entry box and select **Paste** from the shortcut menu that appears.

Running Command Strings

Console stores the commands strings created in the Control tab for subsequent execution via the **STRING** serial command. You can execute the **STRING** command in macros, using control pin programming, in the Event Scheduler, and from the Control Console page of the Web Builder tab. Using macros also enables you to execute command strings from external control devices. See the **Control Tab** topic for more information.

For additional information, refer to the *Table of Contents* for these related topics:

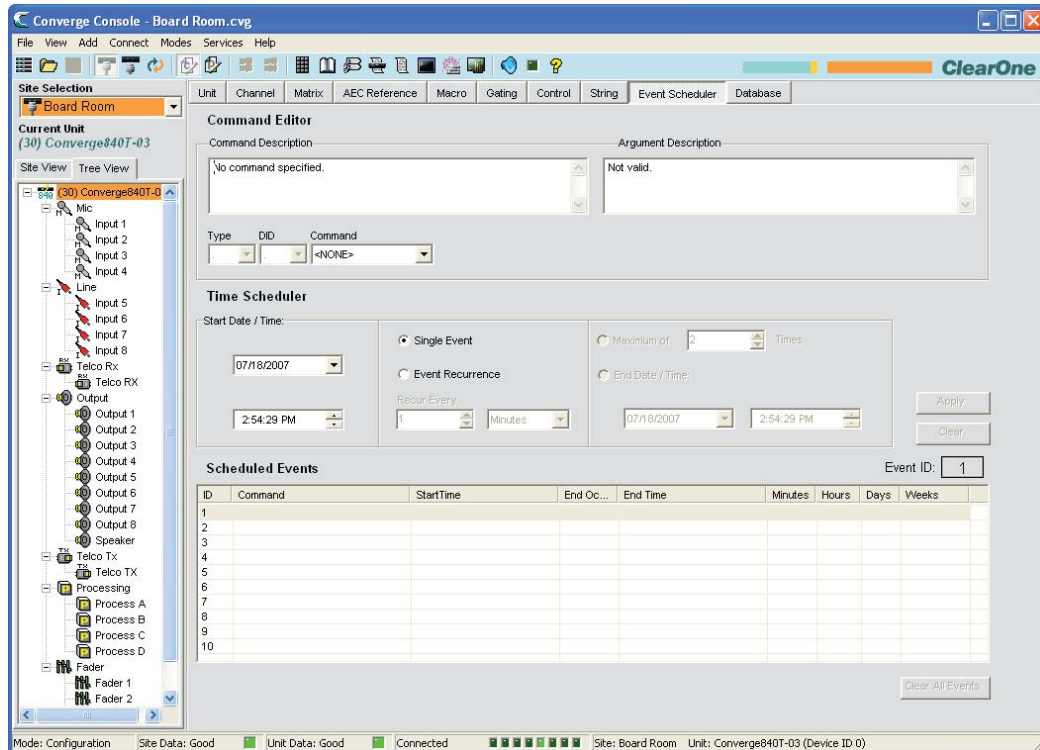
- **Controls and Connections**
- **Front Panel**
- **Control/Status Port**
- **Gating Tab**
- **Macro Tab**
- **Event Scheduler**
- **Control Tab**

EVENT SCHEDULER TAB

The **Event Scheduler** allows you to schedule commands for execution at a specific time (events). Using the event scheduler, you can schedule single events or recurring events that are executed at pre-defined time intervals.

Accessing the Event Scheduler

To schedule events, press the **Event Scheduler Tab** on the **Tab Bar** in Console.



Scheduling Events

Events must be scheduled and run on the local device. However, commands can be sent from events to other devices in the site using Macros.

Use the following procedure to schedule events:

1. In the **Command Editor** section of the screen, select command from the **Command** drop-down list. The command description appears in the **Command Description** box, parameters appear next to the **Command** drop-down list, and the valid values for each parameter appear in the **Argument Description** box.



The commands available for event scheduling include:

- **MACRO** –Executes a macro
- **PRESET** –Executes a preset
- **RESET** –Resets the specified device

- **SFTYMUTE** –Mutes all channels on the specified unit
- **STRING** –Runs a command string
- **SYSCHECKS** –Runs system diagnostics

- To schedule a single event, select **Single Event** and set the desired **Start Date/Time** in the **Time Scheduler** section of the screen.

- To schedule a recurring event, select **Event Recurrence**; set the recurrence interval using the **Recur Every** fields; and select either **Maximum of Times** or **End Date/Time** to specify the number of repetitions or time period for event execution respectively.

NOTE: Clicking on the arrow button next to a date entry field in the **Time Scheduler** section of the screen displays a calendar for date selection.

- Click the **Apply** button to schedule the event. The event appears in the Scheduled Events List.

ID	Command	StartTime	End Oc...	End Time	Minutes	Hours	Days	Weeks
1	#.. SFTYMUTE 0	05/01/2007 07:58:00 PM						
2								
3								
4								
5								
6								
7								
8								
9								
10								

- Add additional events as required by repeating steps 1 through 4.
- To clear a single event, highlight the event and press **Clear**. To clear all scheduled events, press the **Clear All Events** button. Answer **Yes** in the **Warning** dialog that appears.

NOTE: Events can also be viewed and scheduled via the Management page of the Converge Pro Web Portal.

For additional information, refer to the *Table of Contents* for these related topics:

- **Macro Tab**
- **Preset Mode Overview**
- **Safety Mute**
- **String Tab**
- **System Checks**

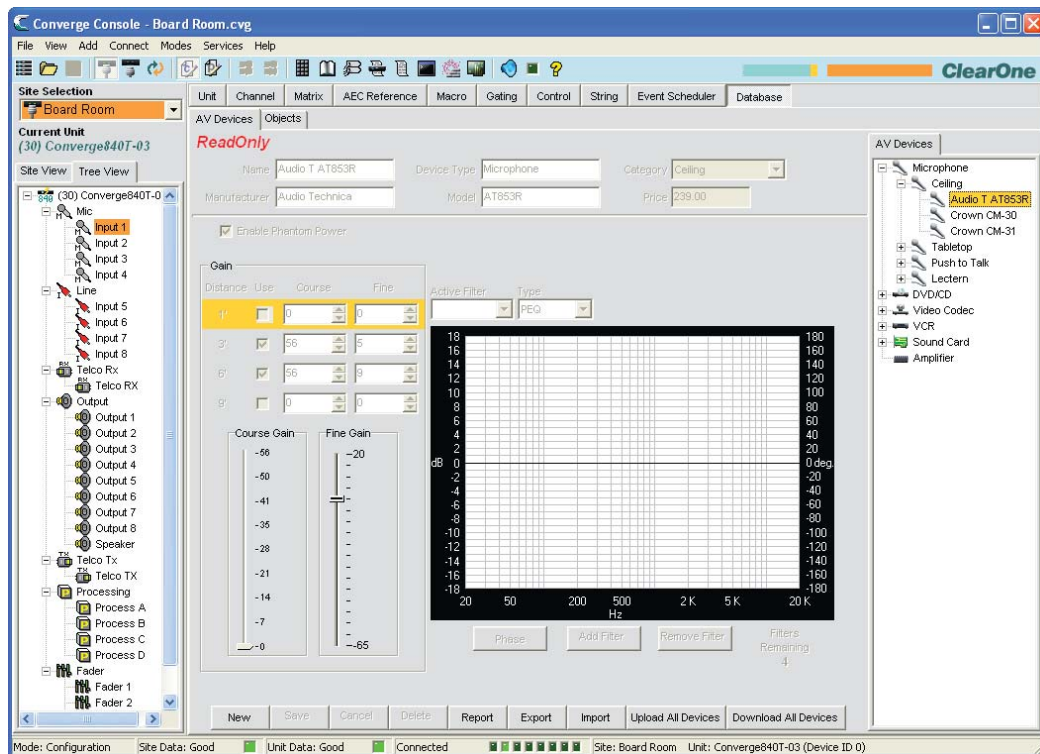
DATABASE TAB

The **Database Tab** enables you to create, modify, and save AV devices, channel objects, and advanced objects. AV devices allow you to save pre-defined configurations for a particular type of device, such as a ceiling microphone. Channel objects allow you to save pre-defined configurations for a channel. Advanced objects allow you to save matrix, macro, control, and preset objects for advanced configuration and automation tasks.

Using AV devices and channel objects, you can create standardized configurations for particular room types and equipment, and quickly configure a venue. See *Drag & Drop Configuration* for more information.

Accessing the Database

To access the Database, select the **Database Tab** from the **Tab Bar** in Console.



As shown above, there are two tabs available in the center pane: **AV Devices** and **Objects**. A corresponding tab is displayed in the **Object Pane** on the right side of the screen. The **Database Button Bar** is located at the bottom of the Center Panel. These components are described in the following sections.

NOTE: Advanced object types do not appear in the object pane with channel objects. To access the object pane for advanced object types (matrix, macro, control, and preset objects), select the corresponding tab on the tab bar. The object pane then appears on the right side of the screen.

Database Button Bar

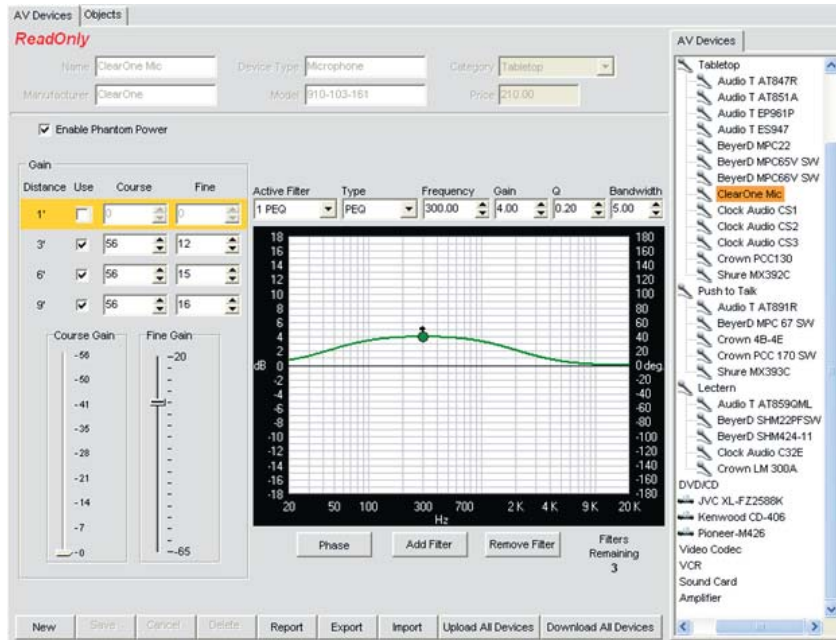
The Database Button Bar (shown below) allows you to create, save, delete, export, import, upload, and download AV Devices and Objects. Buttons available change based on the device/object selected and the status of the configuration screen displayed in the center pane.



Click the **Report** button to view and print a report of all AV devices.

AV Devices

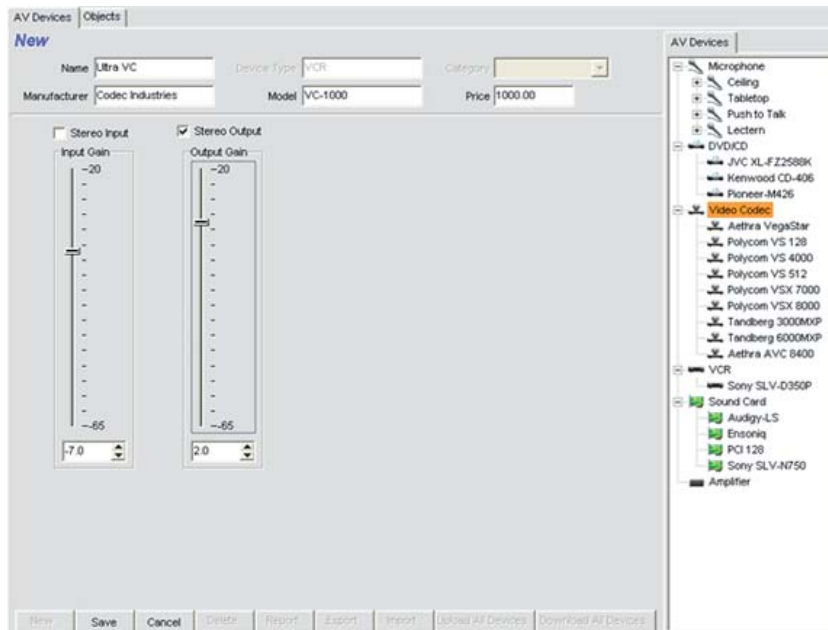
AV devices allow you to save pre-defined configurations for a particular type of device, such as a ceiling microphone. To access AV devices, expand the **AV Device Tree** in the **AV Devices Tab** in the **Object Pane** on the right side of Console. Click on a device in the tree to display its configuration in the center pane. For example, the default settings for a ClearOne tabletop microphone are shown below.



NOTE: Pre-defined AV devices created by ClearOne are **ReadOnly** as indicated in the center pane. They cannot be modified or deleted.

Creating A New AV Device

To create a new AV device, select the type of device you want to create in the **AV Devices Tree**, then click the **New** button on the **Database Button Bar**. The configuration options for that type of device appear on the **AV Devices Tab** in the **Center Pane**. For example, the configuration options for a new Video Codec device are shown below.



Name the new device using the **Name** field. Enter other information as needed, adjust the configuration controls to optimize device performance, and click the **Save** button to save the changes.

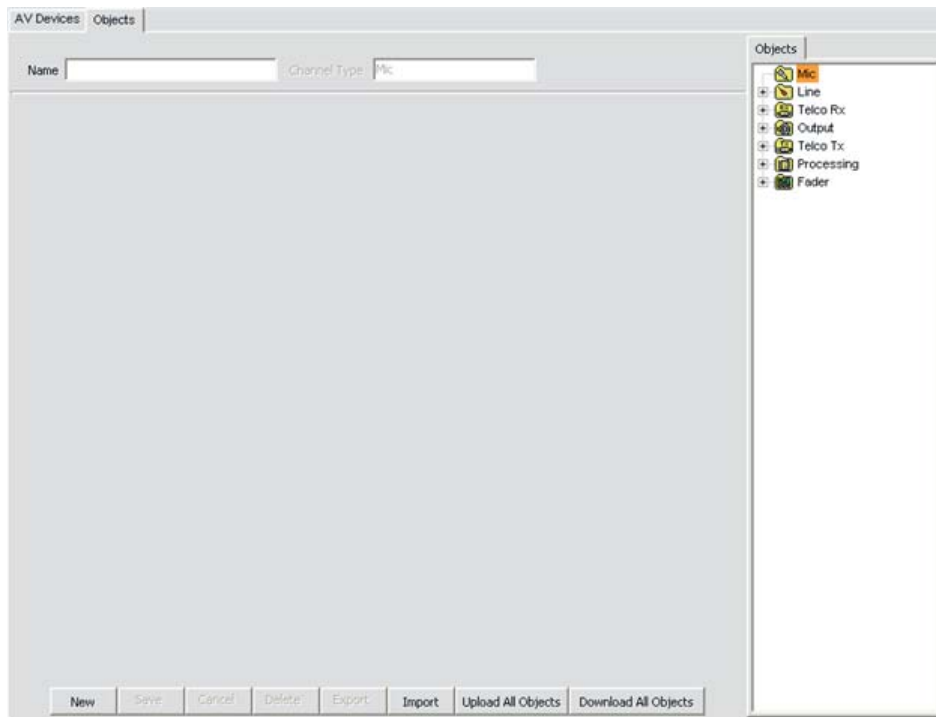
The new device now appears in the **AV Device Tree** as shown below.



NOTE: The AV Device Tree is also available when the Unit Tab is selected, making all pre-defined and custom AV Devices available for Drag and Drop Configuration of a venue.

Channel Objects

Channel objects allow you to save pre-defined configurations for a channel, such as an Output channel. To access objects, select the **Objects** tab in the **center pane**. The **Object Tree** appears in the **Object Pane** on the right side of the screen as shown below.

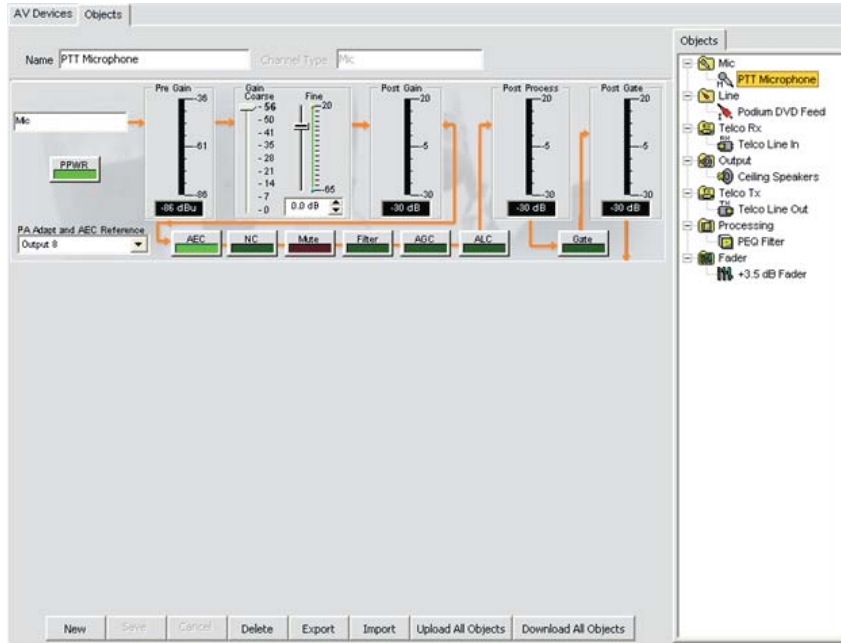


Available channel object types include:

- **Mic Input**
- **Line Input**
- **Telco Rx**
- **Output**
- **Telco Tx**

- Processing
- Fader Channels

To create a new channel object, select an object type in the **Object Tree** and click the **New** button. Enter a name for the object in the **Name** field, adjust the channel configuration controls to optimize channel performance for your application, and press the **Save** button. The new channel object appears in the **Object Tree**, along with all other custom channel objects you have created, as shown below.



NOTE: The Object Tree is also available when either the Unit Tab or the Channel Tab is selected, making all custom channel objects you have defined available for Drag and Drop Configuration of a venue.

Import/Export AV Devices and Objects

All AV Devices and channel Objects are stored as **.XPT files** and **.XMO files** respectively on the host computer or network. To import or export these files, use the **Import** and **Export** buttons on the **Database Button Bar**. These features enable you to share device and object file definitions across sites, applications, and venues.

Upload/Download AV Devices and Objects

To upload or download ALL AV Devices or channel Objects in the database, use the **Upload** and **Download** buttons on the Database Button Bar. These features enable you to share databases among sites, applications, and venues.

Modifying AV Devices and Objects

To modify AV Devices and channel Objects, select the device or object in the **Object Pane**, modify the configuration settings for the device or object in the **Center Pane**, and click the **Save** button on the **Database Button Bar**. When you make changes to the device or object, **Edit** appears at the top of the Center Pane.

NOTE: Pre-defined AV devices created by ClearOne are **ReadOnly** as indicated in the center pane. They cannot be modified or deleted.

Advanced Object Types

In addition to AV devices and channel objects, Console provides advanced object types to streamline site configuration. To access advanced objects, you must select the corresponding tab for the object type on the tab bar. For more information, see these topics under *Drag & Drop Configuration*:

- **Matrix Objects**
- **Macro Objects**
- **Control Objects**
- **Preset Objects**

For additional information, refer to the *Table of Contents* for these related topics:

- **Site Properties**
- **Unit Properties**
- **Unit Tab**
- **Channel Tab Overview**
- **Line Input Settings**
- **Mic Input Settings**
- **Telco RX Settings (840T and TH20)**
- **Output Settings**
- **Telco TX Settings (840T and TH20)**
- **Processing Settings**
- **Fader Settings**
- **Matrix Tab**
- **Preset Mode Overview**

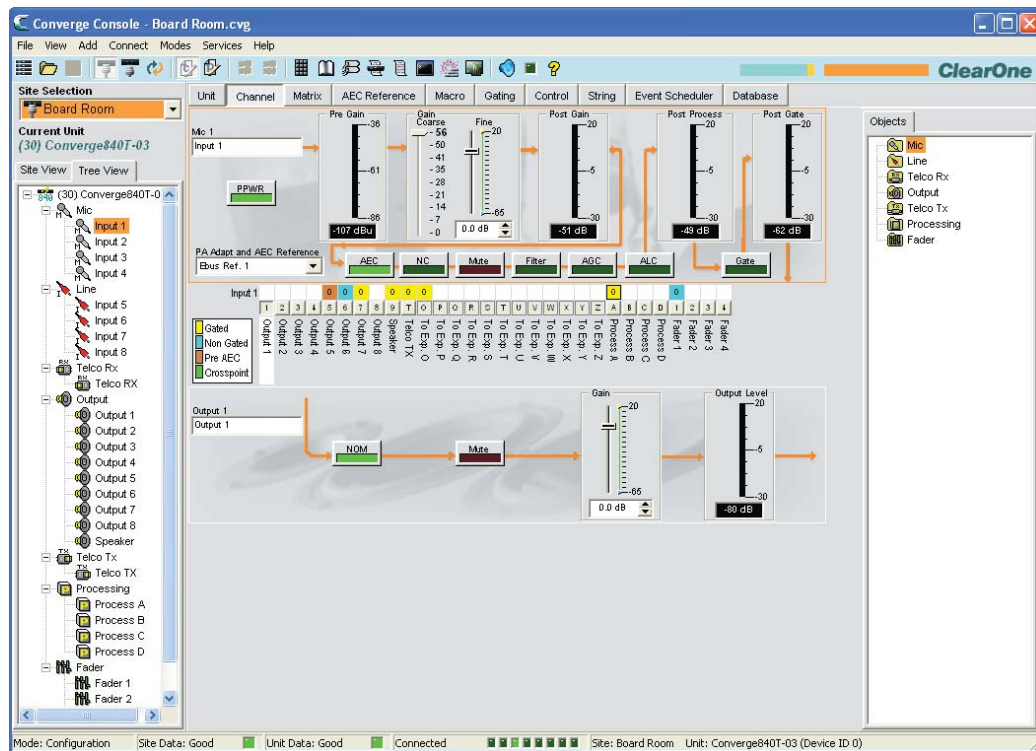
OPTIMIZING GAIN STRUCTURE

Optimizing Gain Structure maximizes the signal-to-noise ratio for each channel, optimizes the performance of Converge Pro processing functions, and ensures optimal audio quality.

- Use these guidelines when optimizing initial gain structure for a venue:
- Connect all input sources and output devices to the Converge Pro unit(s).
- Turn off all processing functions, including **AGC/ALC (Automatic Gain Control/Automatic Level Control)**, **NC (Noise Cancellation)**, and **Filters**.
- Optimize all mic and line inputs that are routed to an output before optimizing the output.
- When optimizing output channels, the objective is to match the output to the nominal gain of the input of the device that is connected to the Converge Pro output channel.
- In general, turn **NOM** off when an output channel feeds an amplifier. Turn NOM on when optimizing telco tx channels, in sound reinforcement applications, and when optimizing for video codec configurations.
- After optimizing gain using the procedures below, re-enable processing functions and NOM as required.

Optimizing Gain for Mic Input Channels

1. Open the **Channel Tab** and select the **Mic Input** on the **Tree View Tab** that you want to optimize, as shown below.



2. Have somebody repeat a test count at a normal distance from the microphone (generally this would be seated at the conference table or positioned for a video teleconference).
3. Adjust the **Coarse Gain Slider** until the peaks on the **Post Gain Meter** are close to +6dB (just hitting yellow), and the average level is close to 0dB.
4. Adjust the **Fine Gain Slider** until the peaks on the **Post Gain Meter** are as close to +6dB and the average level is as close to 0dB as possible.
5. Repeat the above steps for each mic input in the venue.

NOTE: The Post Gain Meter is a peak meter. If the meter remains green, the level may be too low. If it peaks into red, clipping occurs.

Optimizing Gain for Line Input Channels

Line inputs are optimized using the same procedure as mic inputs, with the following exceptions. Select the **Line Input** you want to optimize on the **Tree View Tab**. With the line source connected, monitor the **Post Gain Meter** and adjust the gain level.

NOTE: Line sources, including video codecs, consumer grade CD players, DVD players and VCRs, commonly require 10-12 dB of gain to bring their levels up to 0 dBu.

Optimizing Gain for Telco Rx Channels

Optimize telco rx inputs using the same procedure as mic inputs, with the following exceptions. Select **Telco Rx** on the **Tree View Tab**. With someone talking on the phone, monitor the **Post-Gain Meter** and adjust the gain level.

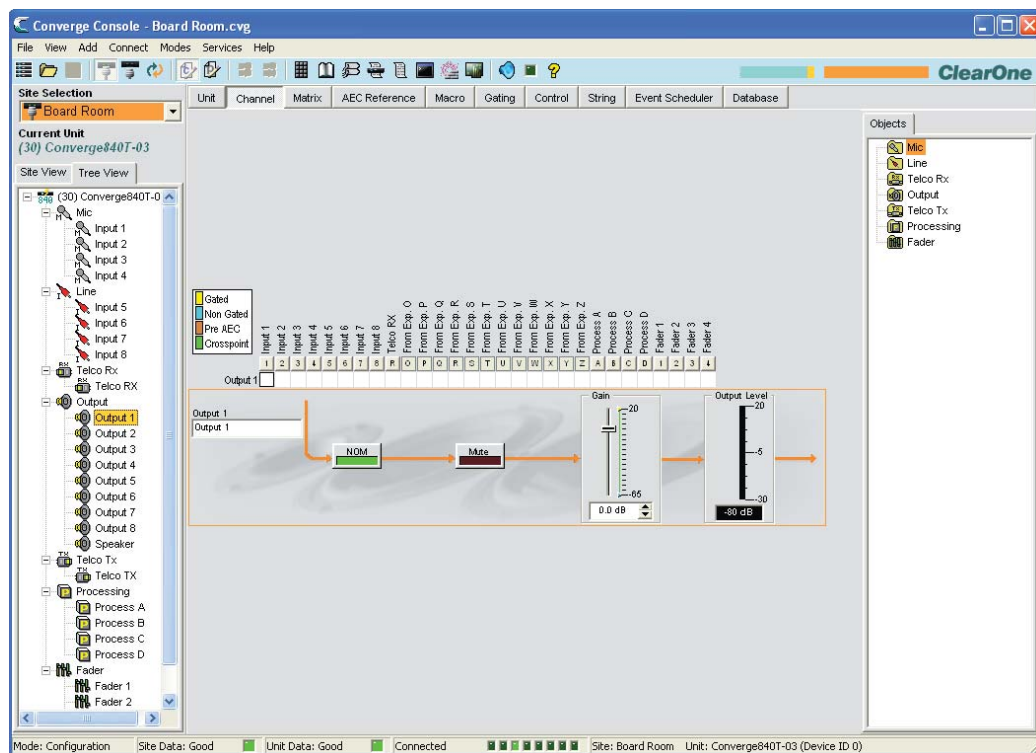
Optimizing Gain for Telco Tx Channels

Optimize telco tx outputs using the same procedure as output channels, with the following exceptions. Select **Telco Tx** on the **Tree View Tab**. With someone speaking into the microphones routed to the telco tx, monitor the **Post Gain Meter** and adjust the gain level.

NOTE: Use a standard handset on the far end because levels can be unpredictable from speaker phones and amplified headsets.

Optimizing Gain for Output Channels

1. Open the **Channel Tab** and select the **Output Channel** on the **Tree View Tab** that you want to optimize, as shown below.



2. Optimize the gain level for all mic, line, and telco rx inputs routed to the selected output channel.
3. Adjust the **Gain Slider** until the average level on the **Gain Meter** matches the nominal level of the next device in the chain.
4. Repeat the above steps for each output channel in the system.

For additional information, refer to the *Table of Contents* for these related topics:

- **Configuration Mode Overview**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Output Settings**
- **AEC (Acoustic Echo Cancellation)**
- **AGC/ALC (Automatic Gain Control/Automatic Level Control)**
- **NC (Noise Cancellation)**
- **Filters**

DRAG AND DROP CONFIGURATION

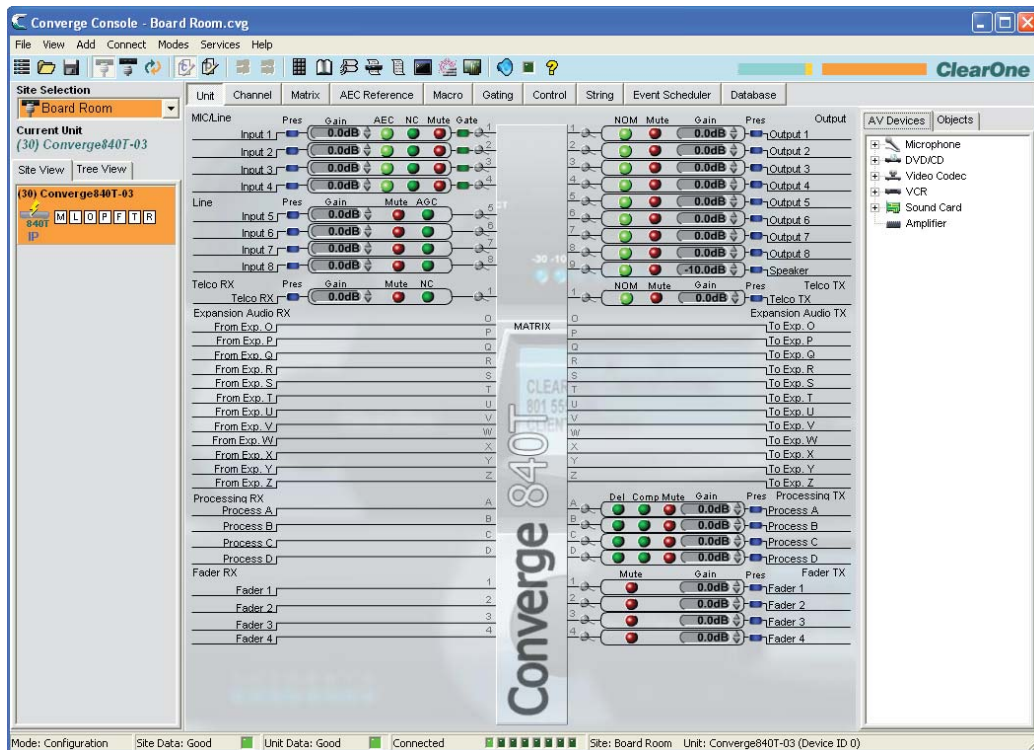
Console provides powerful **Drag and Drop Configuration** capabilities that allow you to quickly configure Converge Pro devices and perform advanced system configuration tasks.

The types of objects available in Console for drag and drop configuration include:

- **AV Devices**
- **Channel Objects**
- **Matrix Objects**
- **Control Objects**
- **Macro Objects**
- **Preset Objects**

Accessing Drag and Drop Configuration

To select objects for drag and drop configuration, use the **Objects Pane** on the right side of Console. The objects available in the objects pane vary depending on the tab selected on the Console **Tab Bar**. For example, when the **Unit Tab** is selected, both AV devices and channel objects are available as shown below.



Using Drag and Drop Configuration

Drag and drop configuration is a three step process for all object types:

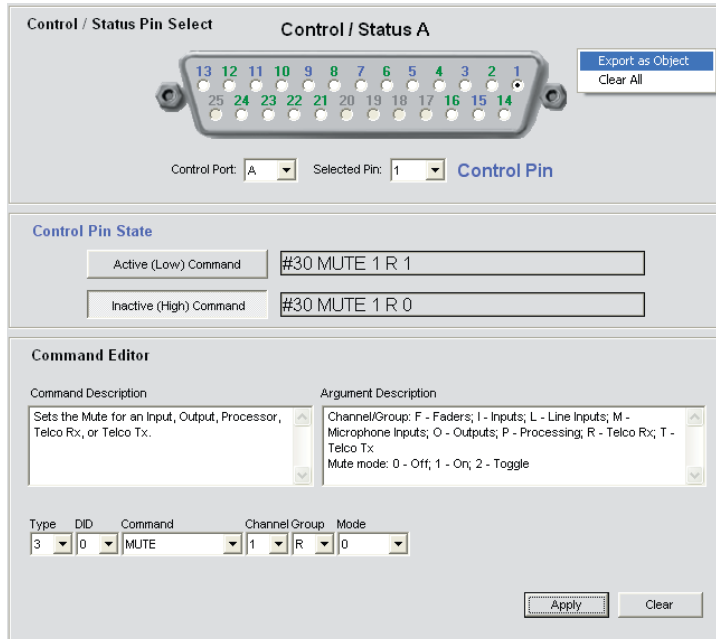
1. Create an object
2. Store it in the **Database**
3. Drag the object from the objects pane onto a channel or screen area (as appropriate for the object type)

The following sections describe creating and applying objects in Console.

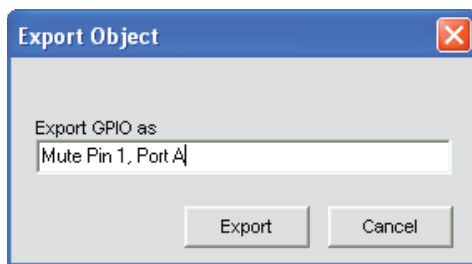
Creating Objects

With the exception of custom AV devices, which can only be created using the **Database Tab**, all objects can be created by right clicking on a screen and using the shortcut menu that appears.

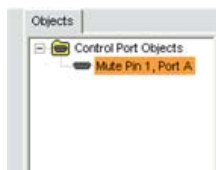
For example, to capture the currently displayed control pin programming as a control port object, right click in the **Control/Status Pin Select** portion of the of the **Control Tab** screen, and select **Export as object** from the shortcut menu (see below).



The **Export Object** dialog appears as shown below. Assign the object a name and press **Export**.



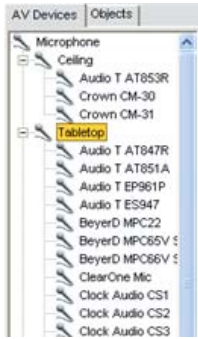
The control object now appears in the objects pane as shown below.



The object is now available for drag and drop configuration.

AV Devices

ClearOne provides numerous pre-configured AV devices, with settings that optimize the performance of the device for a typical (baseline) room. These devices are available in the **AV Devices** tab of the **Objects Pane** as shown below. Click a device type in the **AV Device Tree** to show the available devices of that type.



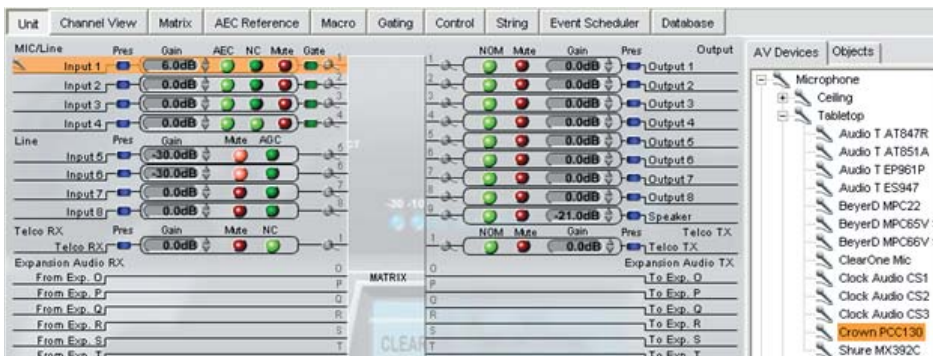
To apply an AV device to a channel, drag the object onto the channel in the **Unit** or **Channel** tabs. For example, to apply a **Crown PCC130** tabletop microphone to **Mic/Line Input 1**, select the object from the **AV Devices** tree and drag it onto the channel.



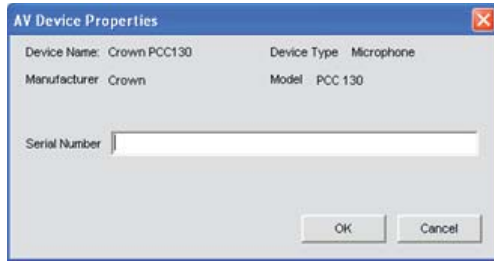
A dialog prompts you for the distance of the microphone to the talker. Select a value and press **OK** to apply the object to the channel.



A microphone icon appears next to the channel, indicating that the channel is using an AV device object configuration.



Click on the microphone icon to view object properties and enter a serial number in the **AV Devices Properties** dialog.

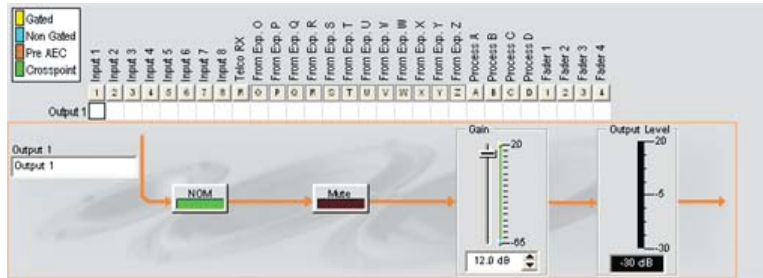


To view detailed information about an AV device's configuration settings, or to create a custom AV device, use the **AV Devices** pane of the **Database** tab.

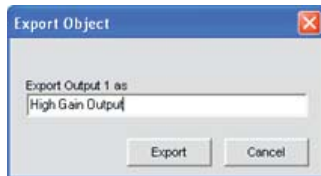
Channel Objects

In addition to using AV devices, you can drag and drop **Channel Objects** in the **Unit Tab** and the **Channel Tab** to instantly apply a saved configuration to a channel. You can save channel objects for all Converge channel types, including **Mic Input**, **Line Input**, **Telco Rx**, **Telco Tx**, **Output**, **Processing**, and **Fader** channels.

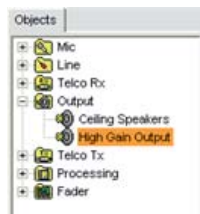
For example, you can configure NOM, mute, and gain settings for **Output 1** on the **Channel** tab as shown below.



To save the object, right click anywhere in the signal flow diagram and select **Export as Object** from the shortcut menu. Enter a descriptive object name in the **Export Object** dialog, and click **Export** to save the object to the database.

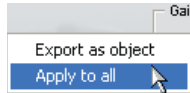


The object now appears in the **Objects** pane.



You can now drag and drop the object onto any channel of the same type to instantly apply the object's configuration settings to the channel.

NOTE: To apply the current channel settings to ALL channels of the same type without saving an object in the database, select **Apply to all** from the shortcut menu when right-clicking on the signal flow diagram. (Menu option not available for Telco Rx or Telco Tx channels.)



To view detailed information about an AV device's configuration settings, or to create a custom AV device, use the **AV Devices** pane of the **Database tab**.

Advanced Configuration Objects

For advanced configuration tasks, Console allows you to create and apply **Matrix Objects**, **Control Objects**, **Macro Objects**, and **Preset Objects** as described in the following sections.

Matrix Objects

Matrix Objects allow you to save customized matrix configurations into the **Database** and reuse them. This enables you to instantly re-configure the entire matrix to accommodate changes in conferencing or venue configuration requirements, and to rapidly configure additional Converge Pro units using drag and drop configuration.

To capture the current matrix configuration and save it as a matrix object, right click anywhere in the center pane of the matrix screen and select **Export as Object** from the shortcut menu.

To apply a matrix object, drag it from the **Objects Pane** and drop it onto the matrix in the **Matrix Tab** screen.

Control Objects

Control Objects allow you to save control port objects into the **Database**. To capture the currently displayed control pin programming, right click in the **Control/Status Pin Select** portion of the **Control Tab** screen, and select **Export as Object** from the shortcut menu. After saving the control port object, it appears in the **Objects** pane on the right side of Console.

To apply a control object after saving it to the database, drag it from the **Objects Pane** and drop it onto the **Control/Status Pin Select** portion of the **Control Tab** screen.

Macro Objects

Macro Objects allow you to save macros into the **Database** and reuse them. To capture a macro and save it as an object, right click anywhere in the center pane of the macro screen and select **Export as object** from the shortcut menu. After saving a macro as an object, it appears in the **Objects** pane on the right side of Console.

To use a macro object, drag it from the **Objects Pane** and drop it onto the **Macro Command List** portion of the **Macro Tab** screen.

Preset Objects

Preset Objects allow you to save preset configurations into the **Database** and reuse them. This enables you to instantly apply preset changes, and to rapidly configure additional Converge Pro units using drag and drop configuration.

To capture the current preset and save it as an object, right click anywhere in the center pane of the preset screen and select **Export as Object** from the shortcut menu.

To apply a preset object, drag it from the **Objects Pane** and drop it onto the **Site Pane** of Console while in Console is in **Preset Mode**.

For additional information, refer to the *Table of Contents* for these related topics:

- **Database Tab**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Output Settings**
- **Processing Settings**
- **Fader Settings**
- **Matrix Tab**
- **Control Tab**
- **Macro Tab**
- **Preset Mode Overview**

PRESET MODE


Preset Mode allows you to create and modify presets. To execute presets, Console must be in Configuration Mode. There are 32 presets available in Console.

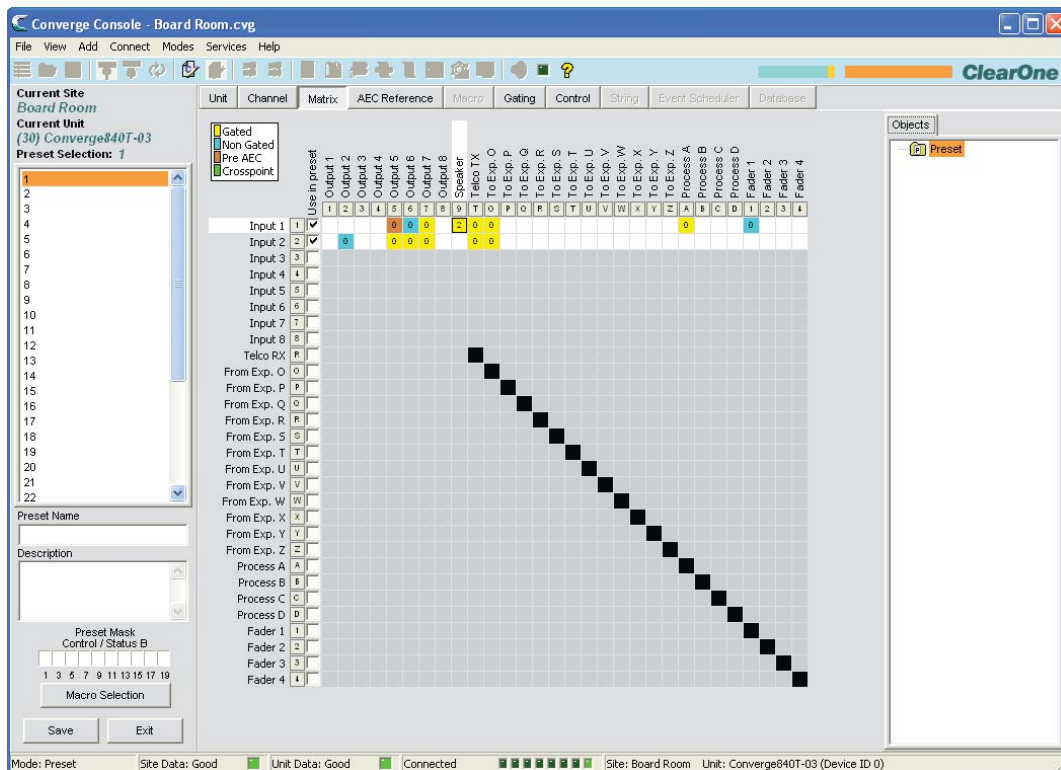
Presets provide the configuration flexibility needed to meet the challenges of changing conference room requirements. These changes include audio routing, gating, muting, levels, AEC referencing, and signal processing, as well as room combining and room configuration. Presets allow you to make configuration changes instantaneously—without interrupting or affecting any conferences in progress.

This topic covers:

- **Preset Configuration Tabs**
- **Creating Presets**
- **Executing Presets**
- **Preset Execution Flags**
- **Preset Control Masking**
- **Preset Storage Space Considerations**
- **Exporting Preset Objects**

Accessing Preset Mode

To access preset mode, press the **Preset**  button on the Console **Button Bar**, or select **Preset** from the **Modes** menu.



As shown above, Console displays the Matrix tab by default in preset mode (rather than the Unit Tab that is the default display in Configuration Mode). The **Site Pane** also changes to display the **Current Site**, **Current Unit**, **Preset Selection** list and the **Preset Name**, **Description**, and **Preset Mask** entry fields.

NOTE: Clicking a channel label in the matrix displays the Channel tab for the channel. Right-clicking anywhere in the matrix displays a shortcut menu that allows you to set a cross point, copy a cell, copy the matrix, paste a matrix, and clear the matrix.

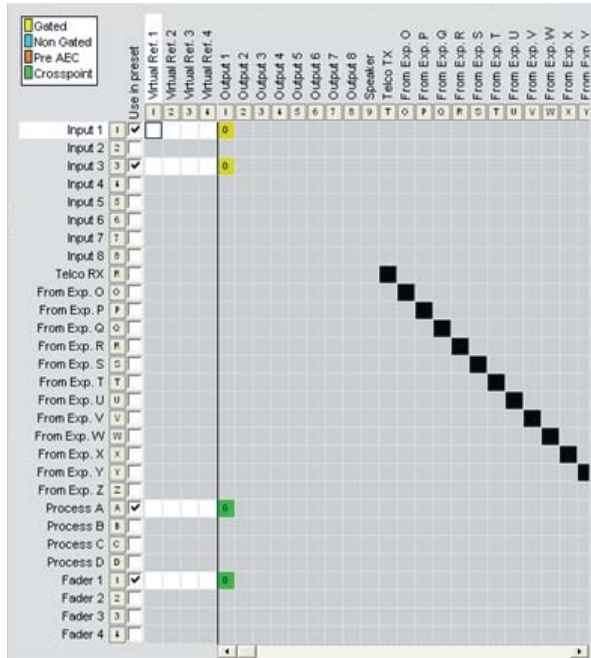
Preset Configuration Tabs

In preset mode, the following tabs are available on the Console **Tab Bar** for defining preset configurations:

- **Unit Tab**
- **Channel Tab**
- **Matrix Tab**
- **AEC Reference Tab**
- **Gating Tab**
- **Control Tab**

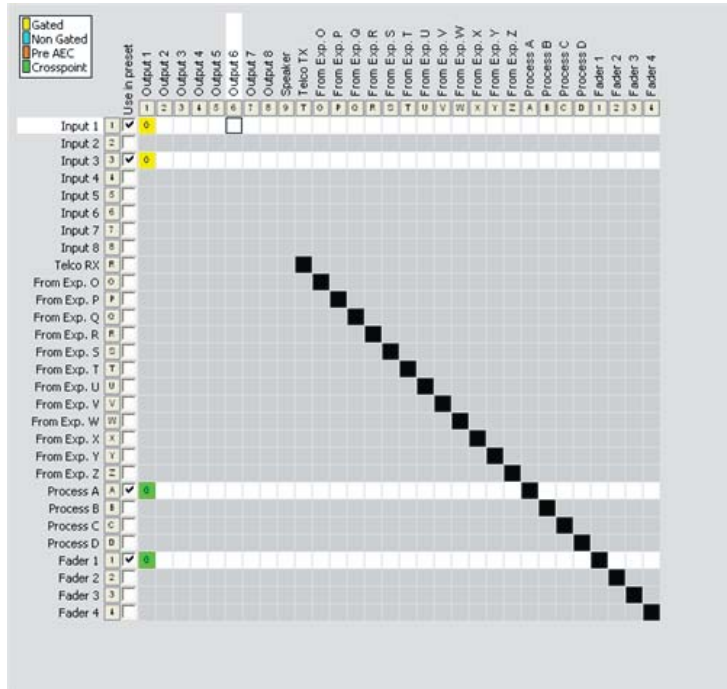
The channels available for configuration in a preset are determined by the channels selected in the **Use in preset** row on the matrix tab. Rows that are not selected in the matrix are grayed out, making them unavailable for preset configuration changes. In addition, only output channels that have a cross point set in the matrix tab will be available in the preset.

When you click a check box in the **Use in preset** row, the row becomes active and you can change its routing, gating, AEC reference, and other settings. All changes will be saved in the preset and executed when the preset is ran. Channels that are not selected remain unchanged after preset execution.



In the example above, Input 1 and Input 3 are selected for use in the preset, and routed to Output 1 with gating enabled and a cross point level adjustment of zero. Cross points are also set for Output 1 on the Process A and Fader 1 channels.

For AEC reference changes in a preset, you can also select channels in the **Use in preset** row as shown below. (Note that only the channels selected and cross pointed in the matrix are available, and that they are selected by default.)



Creating Presets

Use the following procedure to create presets:

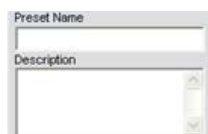
1. Press the Preset Mode button on the Button Bar to put Console into preset mode.



2. Select the number of the preset you want to configure in the **Preset Selection** list.

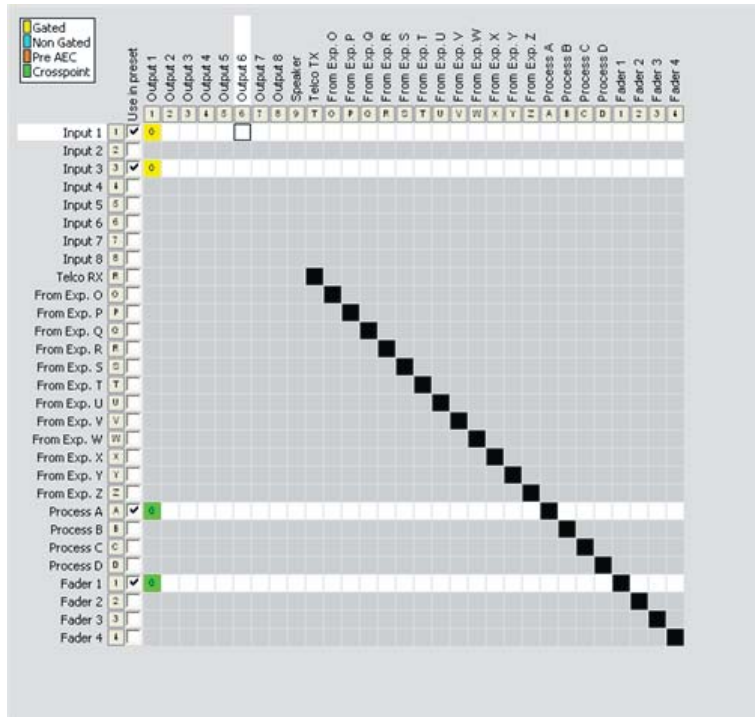


3. Enter a **Preset Name** and **Description** in the entry fields (optional).



4. Select the channels you want to include in the preset using the **Use in preset** check boxes in the matrix.

- Set the output channel cross points that you want to include in the preset using the matrix.



- Configure the desired setting changes for the preset including:
 - Mic Input, Line Input, Output, Telco Rx, Telco Tx, Processing, and Fader channel settings
 - Gating settings
 - Control settings
 - AEC Reference settings
- Click on the Preset Mask Control/Status B boxes to set the pin states (H = High, L = Low) required to trigger preset execution (optional). See Preset Control Masking for more information.



- Press the Macro Selection button to execute one or more macros when the preset executes (optional).



NOTE: In most cases, macros should not be used in a preset unless you want to run a serial command. Some examples that require a macro include querying device status when a preset executes, and sending a command string to an external control device to indicate preset/room configuration status. Also, macros execute at the end of a preset after all other routing, level, and configuration changes included in the preset are completed.

- Press the Save button to save the preset
- Click the **Exit** button to exit preset mode and return to configuration mode.

The preset is now available for execution as described below.

Executing Presets

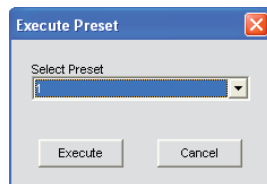
There are five ways to execute presets:

1. Using Console in Configuration Mode
2. Using the LCD Preset Menu on the Front Panel
3. Using control programming and external control devices (such as the closure contacts on a room partition)
4. Using macros
5. Using serial commands via a Telnet session or via RS-232

NOTE: Presets only run on the current unit shown in the site pane. However, you can execute a preset on a unit connected to the Expansion Bus by using a macro.

Executing Presets Using Console

Select **Execute Preset** from the **Services** menu, or press the Execute Preset  button on the button bar. Select the preset you want to execute from the **Execute Preset** dialog that appears, and press the **Execute** button.

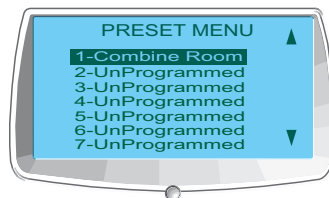


NOTE: When executing presets in Console, Console assumes a preset execution flag value of 2, meaning that the preset executes and its execution state is set to off.

Executing Presets Using the LCD Preset Menu

Press the **Select** button on the front panel, use the **Menu Dial** to select **Presets**, and press the **Select** button.

The **Preset Menu** appears as shown below:



NOTE: When executing presets from the LCD Preset menu, Console assumes a preset execution flag value of 2, meaning that the preset executes and its execution state is set to off.

Use the following procedure to execute presets from the front panel LCD display:

1. Use the **Menu Dial** to highlight the preset you want to execute
2. Press the **Select** button
3. Answer **Yes** at the prompt that appears to run the selected preset, or **No** to cancel.

Executing Presets Using Control Programming

Use the **PRESET** serial command in the **Active (Low) Command** or **Inactive (High) Command** fields in the **Control Pin State** section of the Control Tab. To execute multiple presets when a control condition is met, use the **MACRO** command to call a macro with multiple **PRESET** commands embedded, as explained in the next section.

For more information on **PRESET** and the complete Converge Pro serial command set, refer to *Appendix A: Serial Commands*.

Executing Presets Using Macros

Use the **PRESET** serial command to execute presets in a macro. To run multiple presets at the same time, use multiple **PRESET** commands in the macro. Macros can be executed from within Console or by using any external control device. Typically, you will create a macro for each room configuration (group of presets) that you want to execute at the same time.

Preset Execution Flags

Console uses user-selectable preset flags to determine the current execution state of a preset. This gives you complete control over preset execution, and allows you to combine multiple presets in a macro (or multiple macros) while ensuring that only the presets required for a given room configuration are executed when needed.

The three user-selectable execution flags are:

- 0 = do not execute the preset and set the execution state to **off**
- 1 = execute the preset and set the execution state to **on**
- 2 = execute the preset and set the execution state to **off**

When an execution flag is set to **on**, the associated preset cannot be executed. Conversely, when it is set to **off**, the preset can be executed. To query the current execution flag state for a preset, use the **PRESET** command with the preset number and no other arguments.

Preset Control Masking

In traditional room-combining applications, one preset is created and executed for each room configuration. This can cause volume levels, mute states, and other channel configuration settings to reset for all room sections when a preset is executed. In addition, conferences in progress in unaffected room sections lose any custom settings, and the participants hear unnecessary pops and clicks.

Console eliminates these shortcomings through **Preset Control Masking**, which provides the following advantages:

- Automatic preset masking control when room dividers are wired to **Control** port B pins
- Manual preset masking control via serial commands
- Volume levels and mute states are reset only in sections that change
- Unaffected room sections do not lose custom settings
- Participants in unaffected room sections do not hear pops and clicks

To use preset control masking, click on the **Preset Mask Control/Status B** boxes (located in the **Site Pane** while Console is in preset mode) to set the pin states (**H** = High, **L** = Low) required to trigger preset execution. You can use a pin state or combination of pin states to define when a preset will execute.



A typical use for preset masking is a room-combining application that uses automatic partitions with sensors that set the pin to high when a partition is open, and to low when a partition is closed. For example, if **Pin 1** is connected to a first partition and **Pin 3** is connected to a second partition, then the preset mask control/status B settings shown above would activate the preset when the first partition is open and the second partition is closed.

Preset Storage Space Considerations

In most preset configuration scenarios, it is unlikely that you would reach the storage capacity of a Converge Pro unit. In the event that you exceed the preset storage space, Console will alert you when you try to save the preset. You will be asked to reduce the number of cross point changes in the **Matrix**, or reduce the number of **Macros** in the preset. As a general rule, you make cross point changes to three-fourths of the matrix with up to two macros in a given preset; **OR** you can use up to 255 nested macros for a given preset.

Exporting Preset Objects

Preset objects allow you to save preset configurations into the **Database** and reuse them. This enables you to instantly apply preset changes, and to rapidly configure additional Converge Pro units using **Drag and Drop Configuration**.

To capture the current preset and save it as an object, right click anywhere in the center pane of the preset screen and select **Export as object** from the shortcut menu.

To apply a preset object, drag it from the **Objects Pane** and drop it onto the **Site Pane** of Console while in Console is in **Preset Mode**.

For additional information, refer to the *Table of Contents* for these related topics:

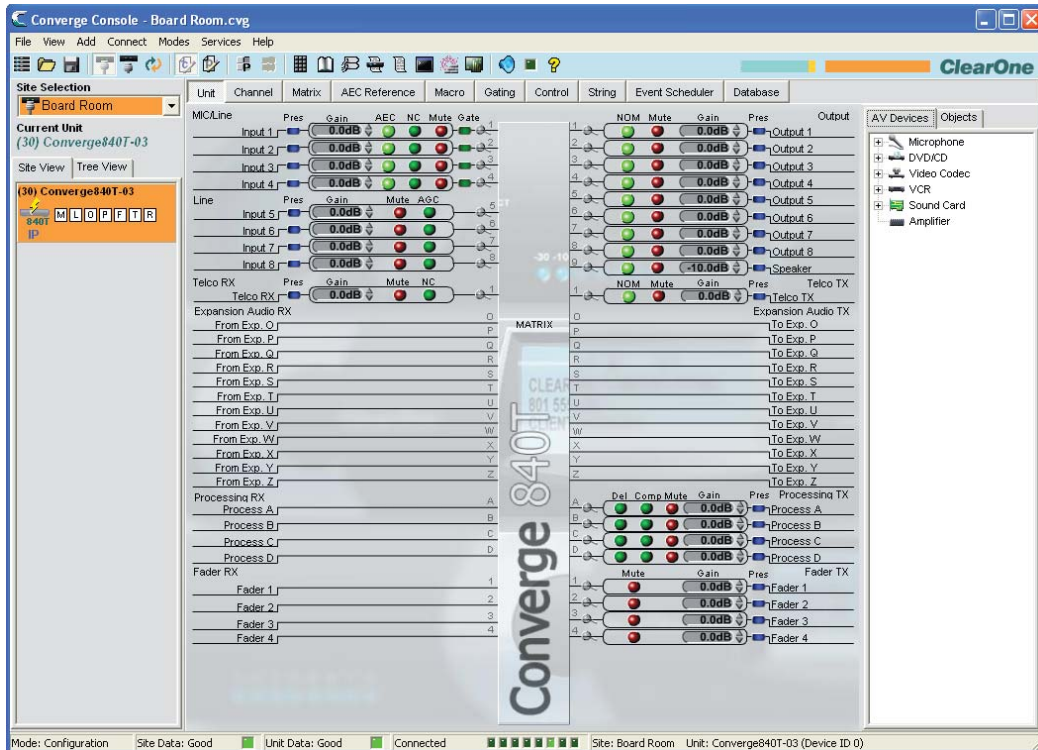
- **Configuration Mode**
- **LCD Presets Menu**
- **Controls and Connections**
- **Expansion Bus Overview**
- **Unit Tab**
- **Channel Tab**
- **Matrix Tab**
- **AEC Reference Tab**
- **Gating Tab**
- **Control Tab**
- **Macro Tab**
- **String Tab**
- **Database Tab**
- **Drag & Drop Configuration**

FILE MENU OVERVIEW

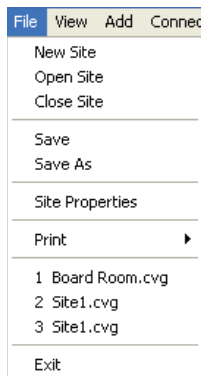
File Menu allows you to use **Site Files** and **Print Reports**.

Accessing the File Menu

In Console, select **File** from the menu bar. The **File** menu appears as shown below:



The **File** menu appears as shown below:



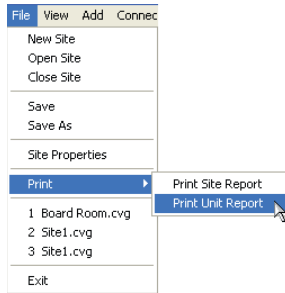
File menu options are explained in the following sections.

PRINT REPORTS

The **Print Reports** option on the **File** menu allows you to print a configuration properties report for a Converge Pro **Site** or **Unit**.

Accessing Print Reports

To print a site or unit report, click on the **File** menu, select **Print**, then select **Print Site Report** or **Print Unit Report** as shown below.



The **Report** window appears as shown below.

Report Window

The screenshot shows the 'Unit Report' window for a Converge Unit. The title bar reads 'Unit Report' and includes standard window controls. Below the title bar is a toolbar with buttons for 'Print', 'Save as PDF', 'First', 'Previous', 'Next', 'Last', 'Page: 1 of 2', 'Page Width', 'Full Page', '100 %', 'Full Page' (dropdown), and 'Close'. The main content area is titled 'Converge Unit Report' and contains several sections:

- Unit Properties:** A table with columns: Unit Name, Audio Master, IP Address, DHCP, Telco Country Code, Baud Rate, Flow Control. Values: (S0) Converge40T-03, Slave, 10.101.24.111, [checked], US, 57600, Hardware.
- Microphone Channels:** A table with columns: Channel Name, Coarse Gain, Fine Gain, NLP, Reference, AEC Settings, Noise Cancellation, Automatic Gain (Max, Target, Response Time, hold), Gating (Type, Ratio, Hold Time, Off Rate, Decay, Chair, Ambient, Adapt, Level).
- Input Channels:** A table with columns: Channel Name, Gain, Mute, AOC, Target, Max. Gain, Threshold, Response Time.
- Telco Rx Channels:** A table with columns: Channel Name, Rx Boost, Rx Enable, Rx Boost, Clear Boost, Effect, ALC, Mute, Gain, Noise Cancellation, Auto Answer, Auto Disconnect, Ring Type, Telco Adaption, Flash Level, Hook Level, Ring Level, Audible Hook Level, Hook Level, Dial Tone Level.
- Output Channels:** A table with columns: Channel Name, Gain, NOM, Mute.

At the bottom of the window, it shows the date and time '8/20/2007 2:23:19 PM' and 'Page 1 of 2'.

The report button bar provides buttons for viewing and printing the document, as well as saving the report to a PDF file. When you are finished viewing the report, click **Close** to close the report window and return to Console.

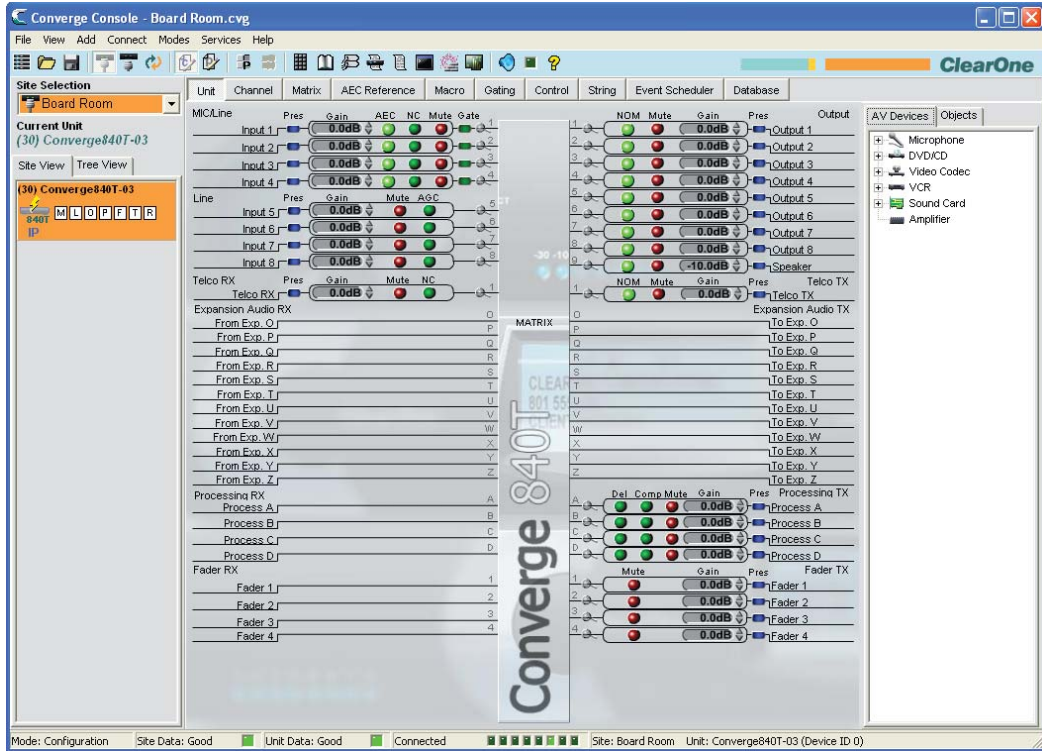
For additional information, refer to the *Table of Contents* for these related topics:

- **Site Properties**
- **Unit Properties**

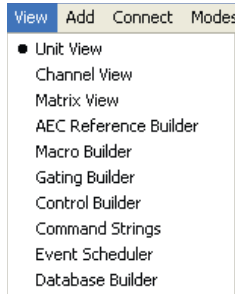
VIEW MENU OVERVIEW

The **View Menu** provides an alternate navigation method for viewing the screens displayed by clicking on the **Console Tabs**.

Accessing the View Menu



In Console, click **View** on the menu bar. The **View** menu appears as shown below:



A bullet indicates the view currently displayed in Console.

View Menu Options

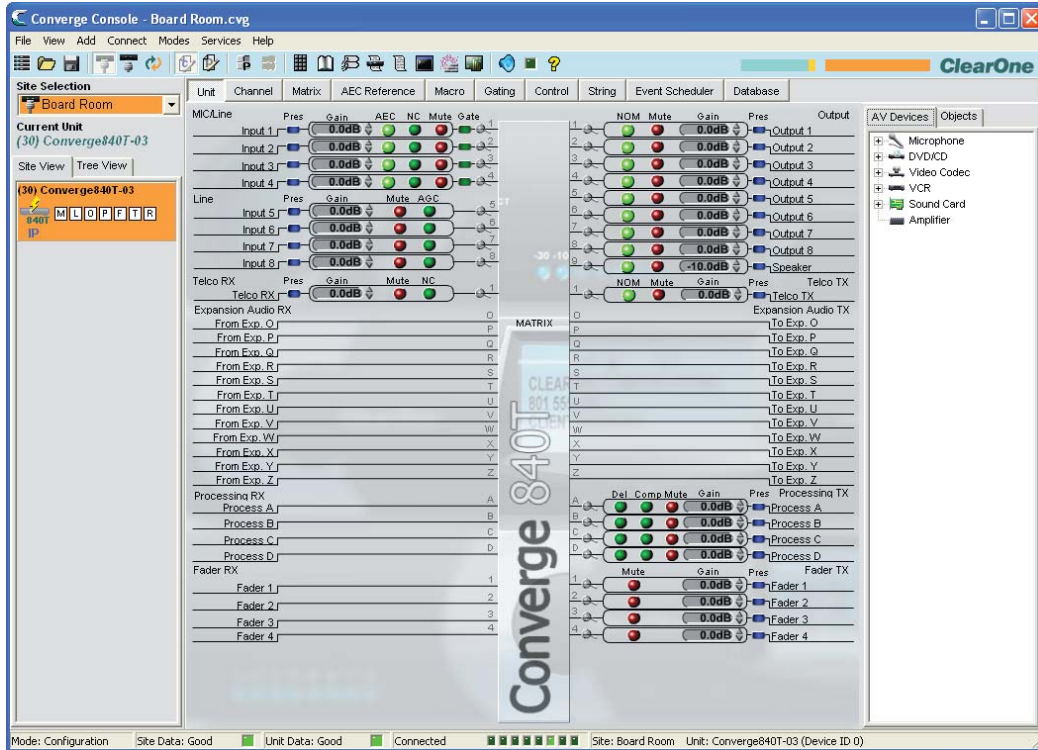
Options available on the View menu include:

- **Unit View**
- **Channel View**
- **Matrix View**
- **AEC Reference Builder**
- **Macro Builder**
- **Gating Builder**
- **Control Builder**
- **Command Strings**
- **Event Scheduler**
- **Database Builder**

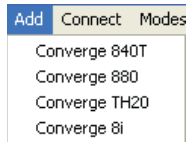
ADD MENU

The **Add Menu** allows you to add Converge Pro units to a site using default configuration settings.

Accessing the Add Menu

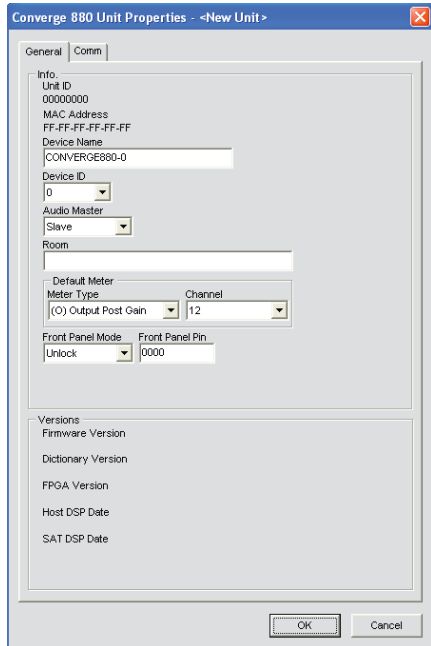


In Console, click **Add** on the menu bar. The **Add** menu appears as shown below:

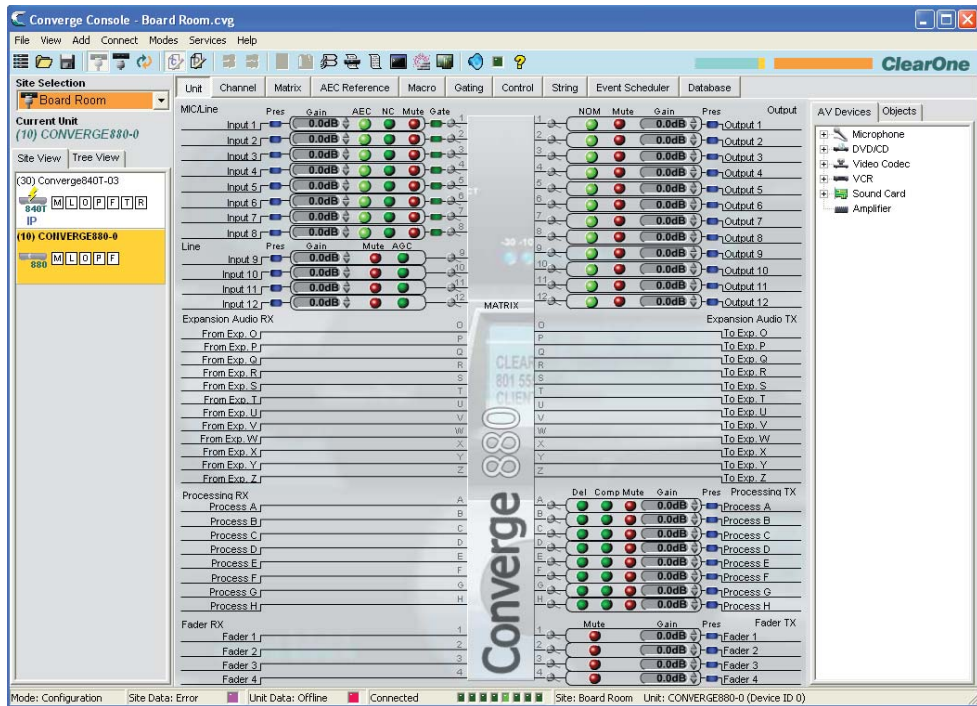


Adding Units

On the Add menu, select the Converge Pro model you want to add to the site. The **Unit Properties** dialog appears as shown below:



Configure the new unit's properties using the **General** tab. Configure the new unit's IP and serial port settings using the **Comm** tab. For more information on configuring unit properties, see **Unit Properties**.



Press **OK** to add the unit to the site or **Cancel** to return to Console. The added unit appears on the **Site View** tab of the **Site pane**, highlighted in orange as shown below:

NOTE: The Status bar at the bottom of the Console window displays the current status of the unit and the site. As shown above, site data errors and unit data errors are indicated by magenta and red LEDs respectively. Complete unit configuration with correct settings to clear the errors. When correct configuration is complete, the status LEDs will change to green.

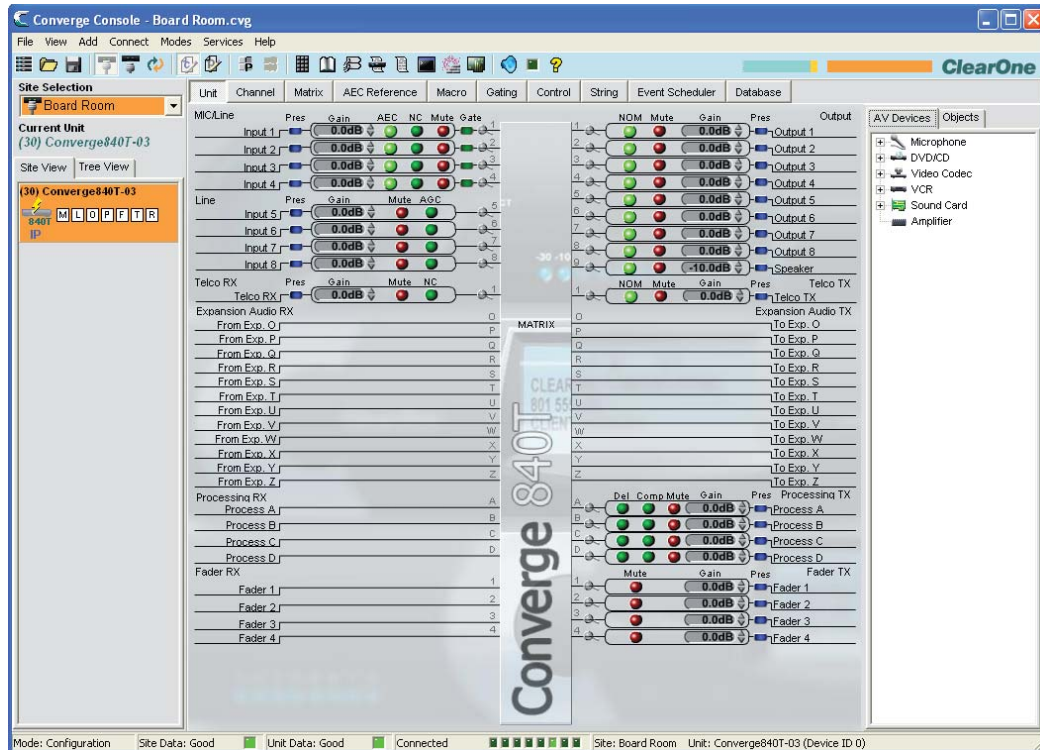
For more information, refer to the Table of Contents for these related topics:

- **Unit Properties**
- **Create A New Site**
- **Connect To A Site**
- **Site Properties**
- **Unit Tab**
- **Configuration Mode Overview**

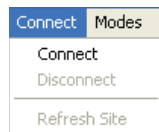
CONNECT MENU OVERVIEW

The **Connect Menu** enables you to connect to a site, disconnect from a site, and refresh the current display for a site. Connecting to a site allows you to control and configure the units in that site. See **Site Setup Overview** for more information.

Accessing the Connect Menu



In Console, select **Connect** from the menu bar. The Connect menu appears as shown below:



Connect Menu Options

- **Connect:** Connects to a site via USB or IP.
- **Disconnect:** Disconnects Console from the currently connected site. (This option is not available if no site is connected.)
- **Refresh Site:** Refreshes site information displayed in the current Console view. (This option is not available if no site is connected.)

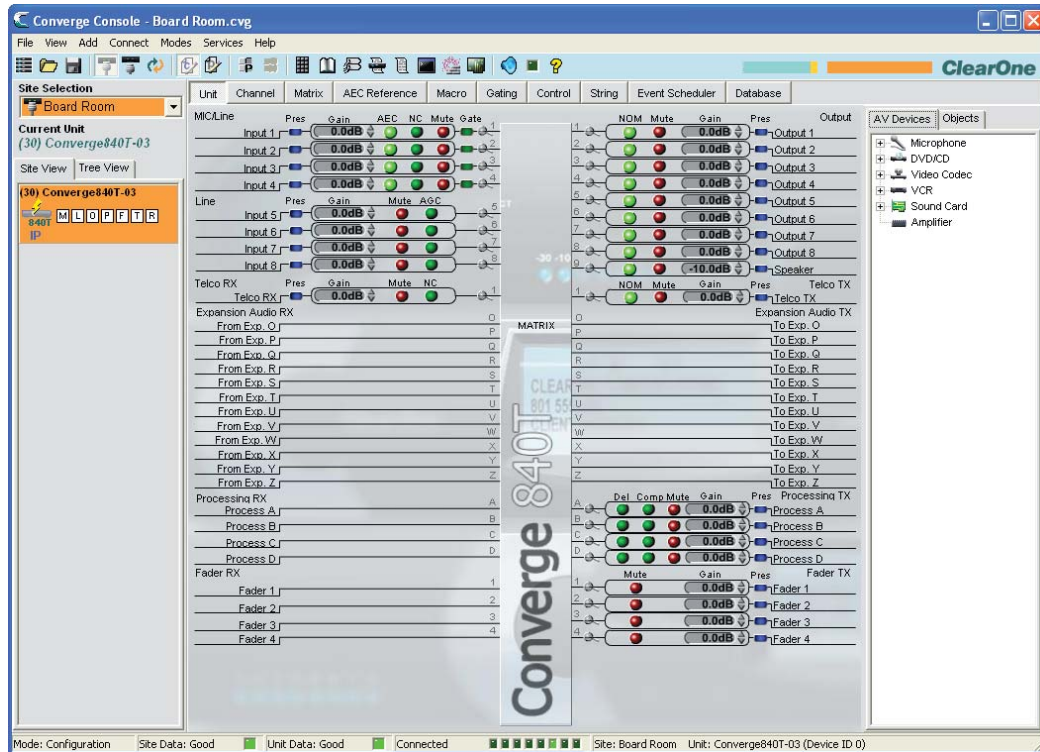
For additional information, refer to the Table of Contents for these related topics:

- **Site Setup Overview**
- **Connect To A Site**
- **Create A New Site**

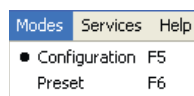
MODES MENU OVERVIEW

The **Modes Menu** allows you to switch Console between **Configuration Mode** and **Preset Mode**. Configuration Mode allows you to configure a wide range of advanced settings for your Converge Pro unit. Preset Mode allows you to create presets for specific venues and apply them to instantly to your Converge Pro unit.

Accessing the Modes Menu



In Console, select **Modes** from the menu bar. The Modes menu appears as shown below:



A bullet indicates the current mode. To switch modes, select **Configuration** or **Preset**. Console immediately reflects mode changes.

NOTE: You can also switch modes using the  buttons on the Console Button Bar.

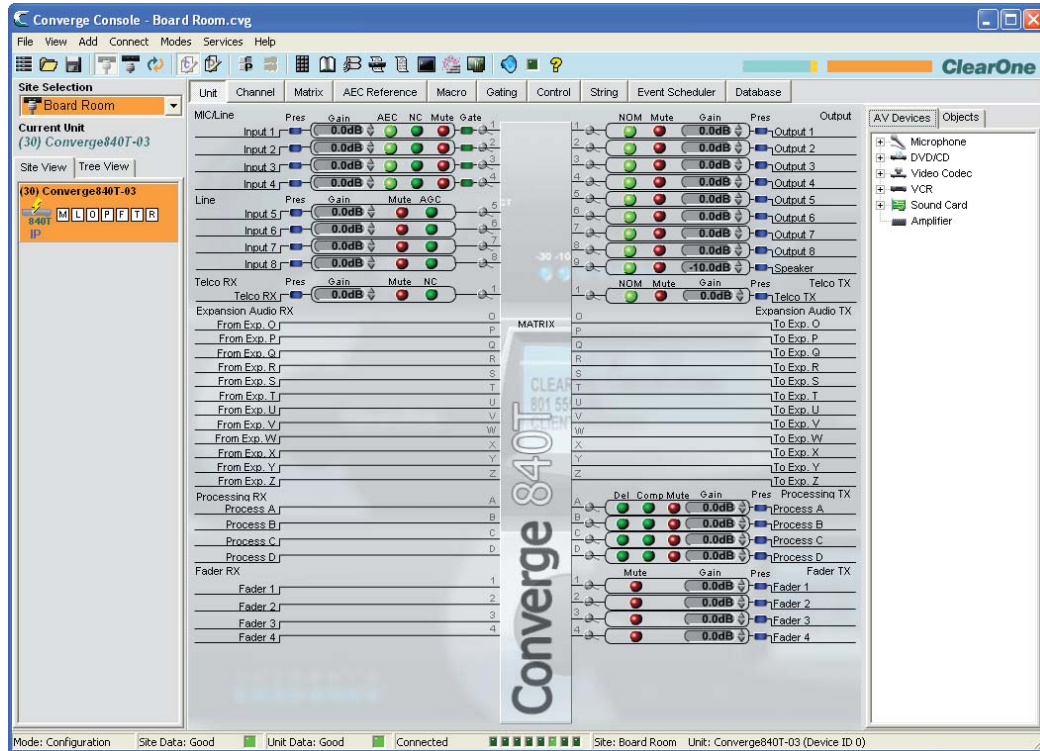
For additional information, refer to the Table of Contents for these related topics:

- **Configuration Mode**
- **Preset Mode**
- **Console Button Bar**

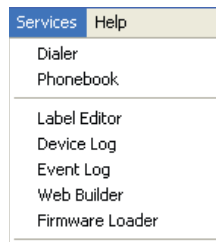
SERVICES MENU OVERVIEW

The **Services Menu** provides various utilities for using and managing Converge Pro units.

Accessing the Services Menu



In Console, click **Services** on the menu bar. The Services menu appears as shown below:



Service Menu Options

Options available on the Services menu include:

- Dialer
- Phonebook
- Label Editor
- Device Log
- Event Log
- Firmware Loader
- Debug Console
- System Checks
- Execute Presets
- Web Builder

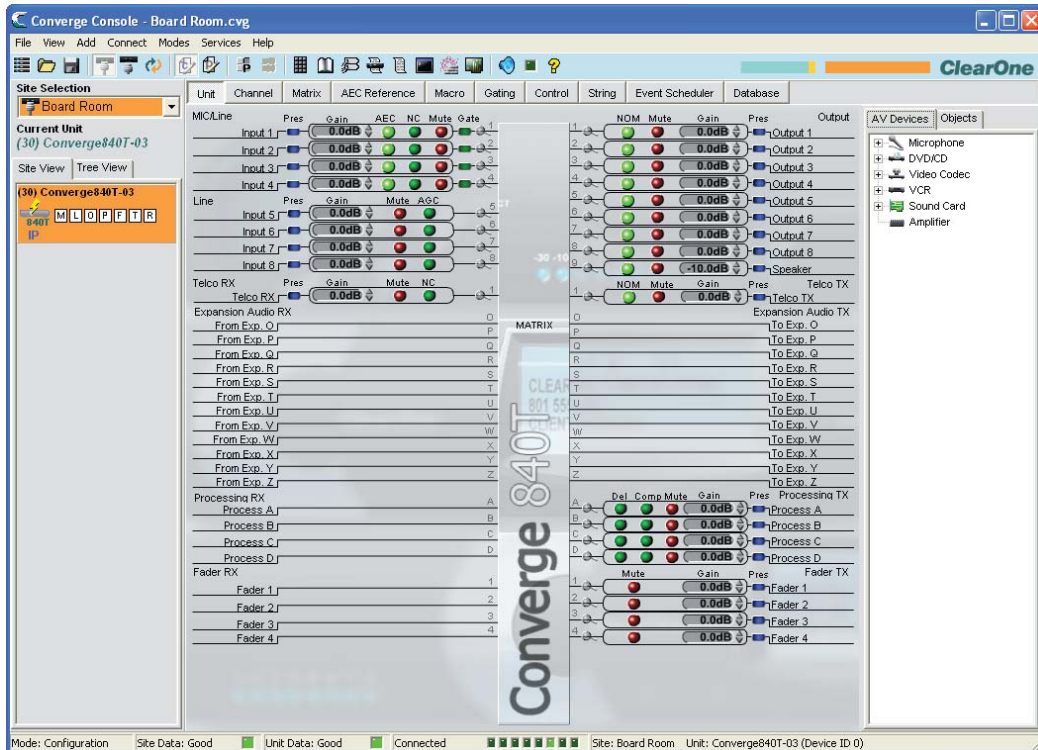
DIALER

The **Dialer** provides a software telephone interface for teleconferencing applications.

NOTE: Dialer is only available when Console is connected to a site.

Accessing Dialer

To access the dialer, select **Dialer** from the Services menu; press the **Dialer**  button on the Console **Button Bar**; or press the **Dialer** button in the **Telco Rx** or **Telco Tx** channel screens.



Using Dialer

When using the dialer, the date and time, number dialed, and call status are displayed in the LCD section of the dialer window.



Placing and Ending Calls

To place a call, select a number from the **Phonebook** section of the dialer window, or manually enter a number, then press the **ON/OFF** hook button.

You can also access the Phonebook by pressing the **PHONEBOOK** button.

To end a call, press the **ON/OFF** hook button.

To redial a number, press the **REDIAL** button.

Using Line Features

Use the **FLASH** button to access telco and PBX line features.

Muting

Use the **MUTE Tx** and **MUTE Rx** buttons to mute the transmit and receive signals respectively when a call is in progress.

Renulling the Line

During conference calls, line conditions and other factors can cause divergence in the automatic **Telephone Echo Cancellation (TEC)** adaption process. If side tone occurs during a conference call, press the **RE_NULL** button to send a short burst of white noise over the line and initiate TEC readaption.

NOTE: Renulling the line sends a burst of white noise that will be audible on the far end of the telephone line.


For more information, please see the *Table of Contents* for these related topics:

- **Connect To A Site**
- **Services Menu Overview**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Phonebook**
- **Telephone Echo Cancellation**

PHONEBOOK (840T AND TH20)

The **Phonebook** allows you to store telephone numbers and make speed-dial assignments for teleconferencing applications.

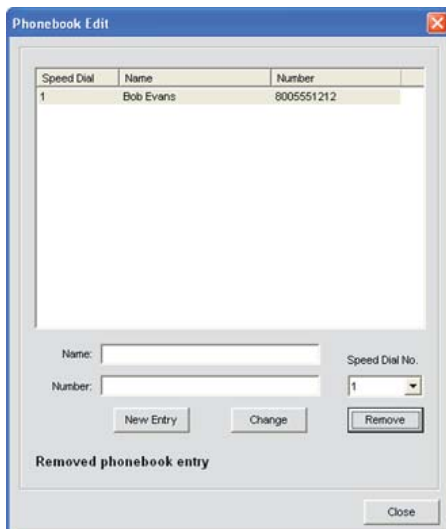
Accessing Phonebook

To access the phone book, select **Phonebook** from the Services menu; press the **Phonebook**  button on the Console **Button Bar**; or press the **Phonebook** button in the **Dialer** screen.



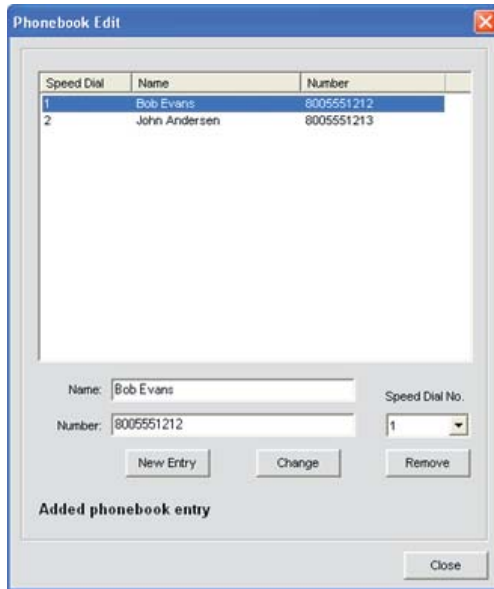
Using Phonebook

To add an entry to the phonebook, press the **New Entry** button; enter a **Name** and **Number**; and select a **Speed Dial Number** (optional).



NOTE: The Number field allows numbers, #, and * only. No other characters (such as parentheses and dashes) are allowed.

Press the **Add** button to add the entry to the phonebook. The number now appears in the phonebook list, and in the **Phonebook** portion of the **Dialer** screen.



To edit an entry, select it and press the **Change** button. To delete an entry, select it and press the **Remove** button.

For additional information, please refer to the Table of Contents for these related topics:


- **Dialer**
- **Button Bar**
- **Services Menu Overview**

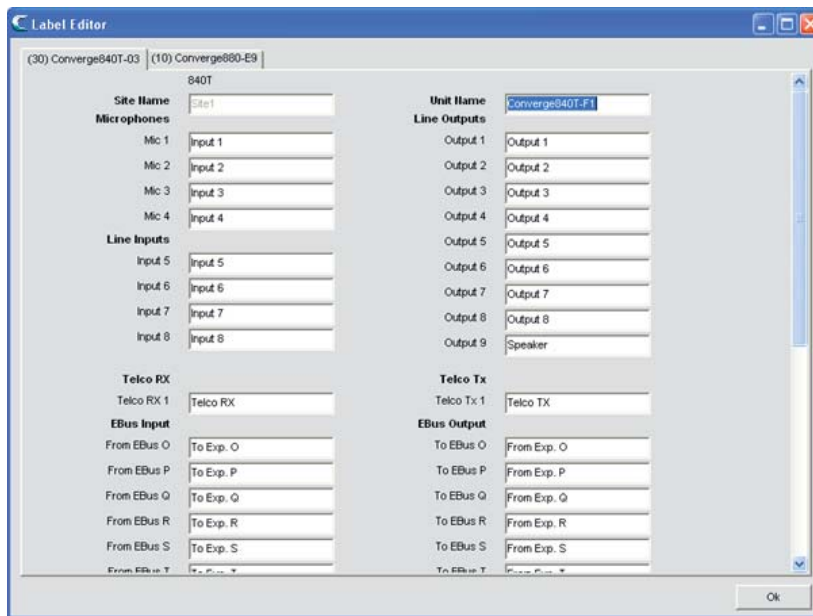
LABEL EDITOR

The Label Editor allows you to quickly change the names (labels) assigned to Converge Pro units and channels. Using descriptive names makes it easier to identify units and channels for configuration and management purposes. Label changes are global, and appear throughout Console wherever the label is referenced.

In addition to using the label editor to rename objects, you can use the label entry fields provided throughout Console.

Accessing Label Editor

To access the label editor, select **Label Editor** from the **Services** menu, or click the **Label Editor**  button on the Converge **Button Bar**.



Using Label Editor

As shown above, the label editor contains one tab for each unit in the currently connected site. To modify a label, select the unit tab and click on the entry field for the object name that you wish to change. When finished, click the **Ok** button to save the changes and close the label editor window.

For additional information, please refer to the *Table of Contents* for these related topics:

- **Services Menu Overview**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Output Settings**
- **Telco Tx Settings (840T and TH20)**
- **Processing Settings**
- **Fader Settings**

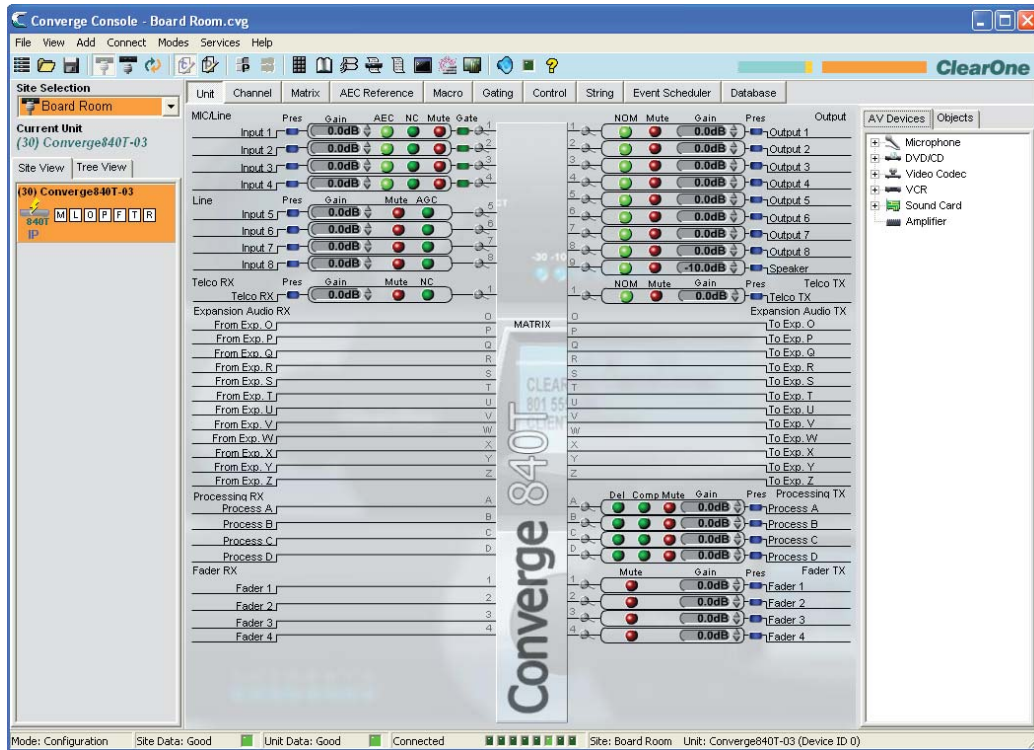
DEVICE LOG

The **Device Log** captures Converge Pro device events for administration, configuration, and troubleshooting purposes.

NOTE: The device log can store 256K bytes of data. Once this limit is reached, the first 128K of data is truncated and logging resumes.

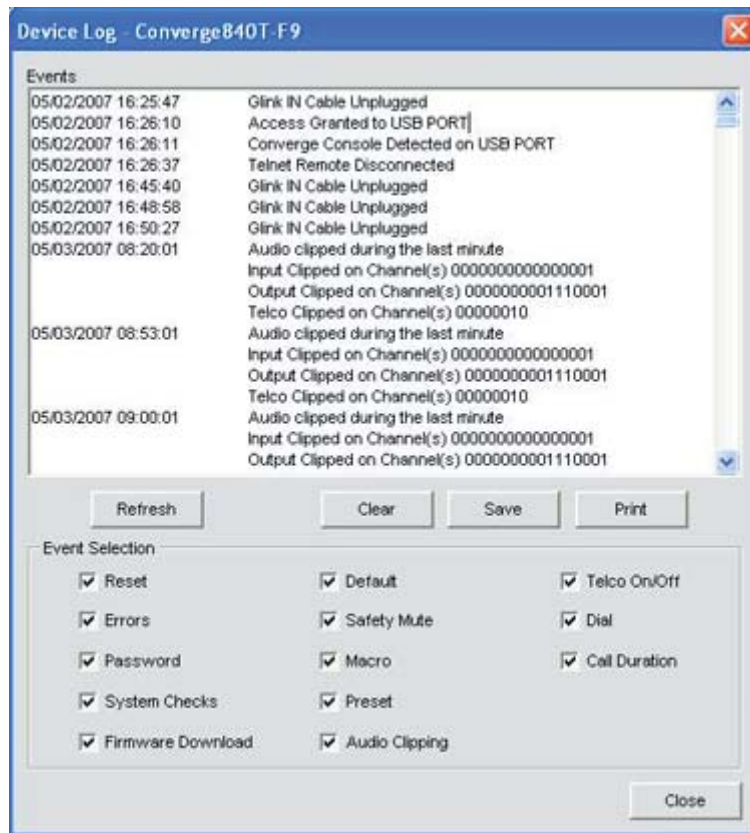
Accessing Device Log

To access the device log, select **Device Log** from the **Services** menu, or click the **Device Log**  button on the Console **Button Bar**.



Using Device Log

In the **Device Log** window, select the events you want to log using the **Event Selection** check boxes.



Events available for logging include:

- **Reset:** Reports unit reset events
- **Errors:** Reports internal unit errors
- **Access:** Reports all web, Telnet, front panel, and USB access events
- **System Checks:** Reports the pass/fail status of System Checks
- **Firmware Download:** Reports firmware downloads
- **Default:** Reports unit default events
- **Safety Mute:** Reports safety mute events
- **Macro:** Reports Macro execution events
- **Preset:** Reports when Presets are run
- **Audio Clipping:** Reports audio clipping events
- **Telco On/Off:** Reports when the telco line goes on or off hook (840T and TH20 only)
- **Dial:** Reports dial command events including DTMF, Phonebook, Speed Dial, and Redial (840T and TH20 only)
- **Call Duration:** Reports the time between on and off hook events for all calls (840T and TH20 only)

NOTE: All device events and Event Scheduler events are logged automatically.

Use the **Refresh**, **Clear**, **Save**, and **Print** buttons to refresh the log display, clear the log, save the log to a text file, and print the log.

For additional information, please refer to the *Table of Contents* for these related topics:

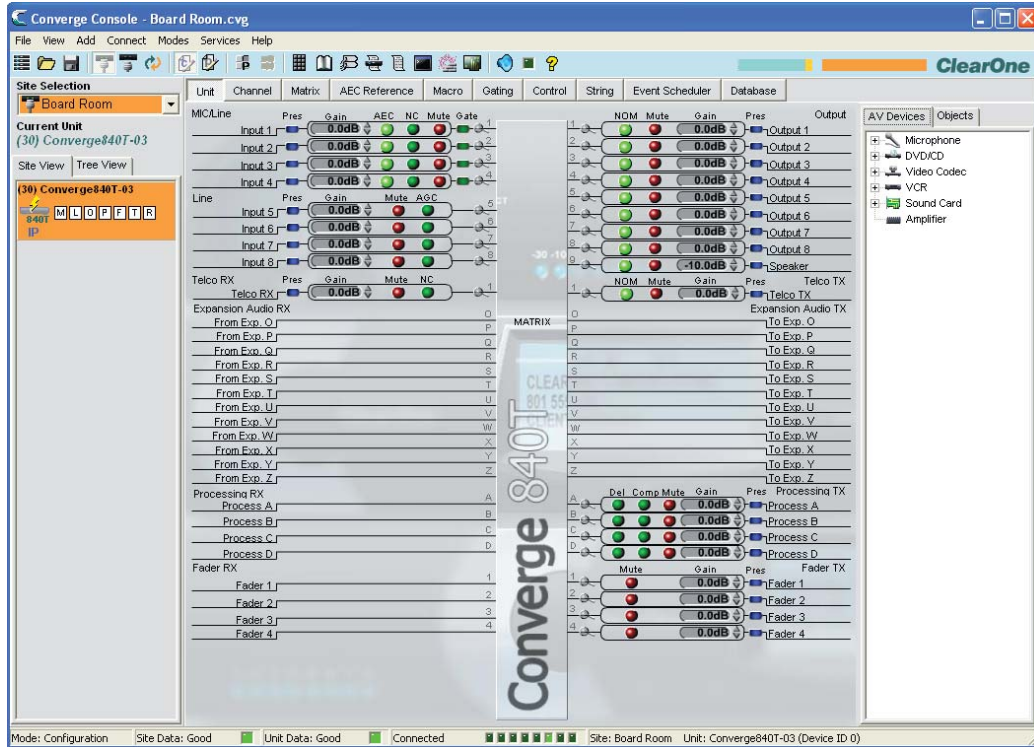
- **Site Properties**
- **System Checks**
- **Firmware Loader**
- **Console Overview**
- **LCD Settings Menu**
- **Macro Tab**
- **Preset Mode Overview**
- **Execute Presets**
- **Dialer**
- **Phonebook**

EVENT LOG

The **Event Log** captures Console events for administration and troubleshooting purposes. Event types captured include failed login attempts, site disconnects, unit reboots, socket time outs, internal system errors, and serial command execution errors.

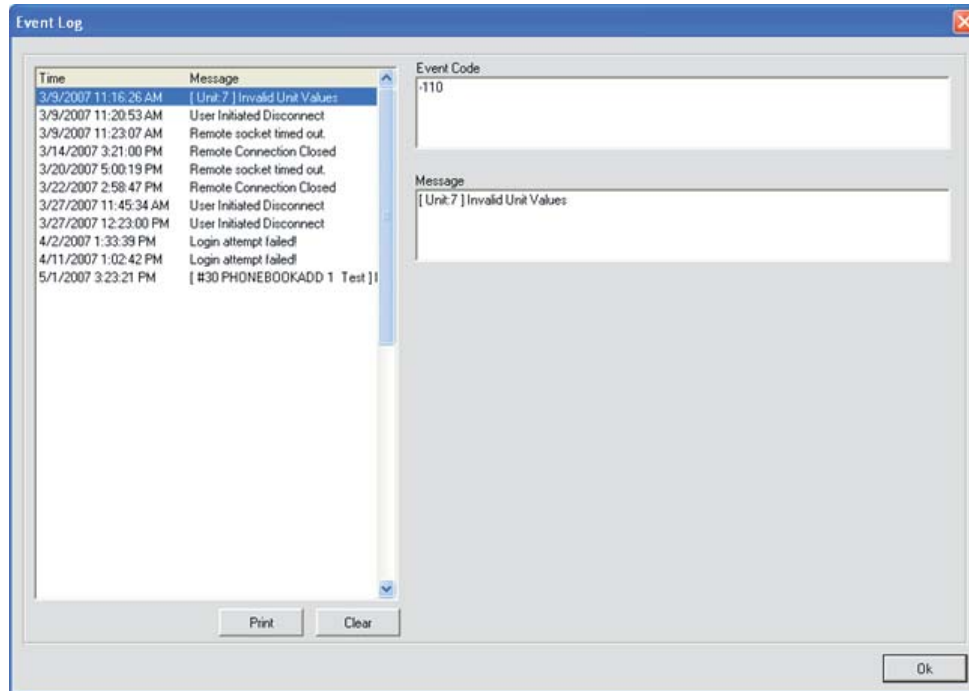
Accessing Event Log

To access the event log, select **Event Log** from the **Services** menu, or click the **Event Log**  button on the Console **Button Bar**.



Using Event Log

Captured events appear in the left section of the Event Log window. **Event Codes** and **Messages** appear in the right section of the window.



To print the event log, press the **Print** button. To clear the event log, press the **Clear** button and answer **Yes** to the confirmation dialog that appears.

For additional information, please refer to the Table of Contents for these related topics:

- **Services Menu**
- **Event Scheduler**

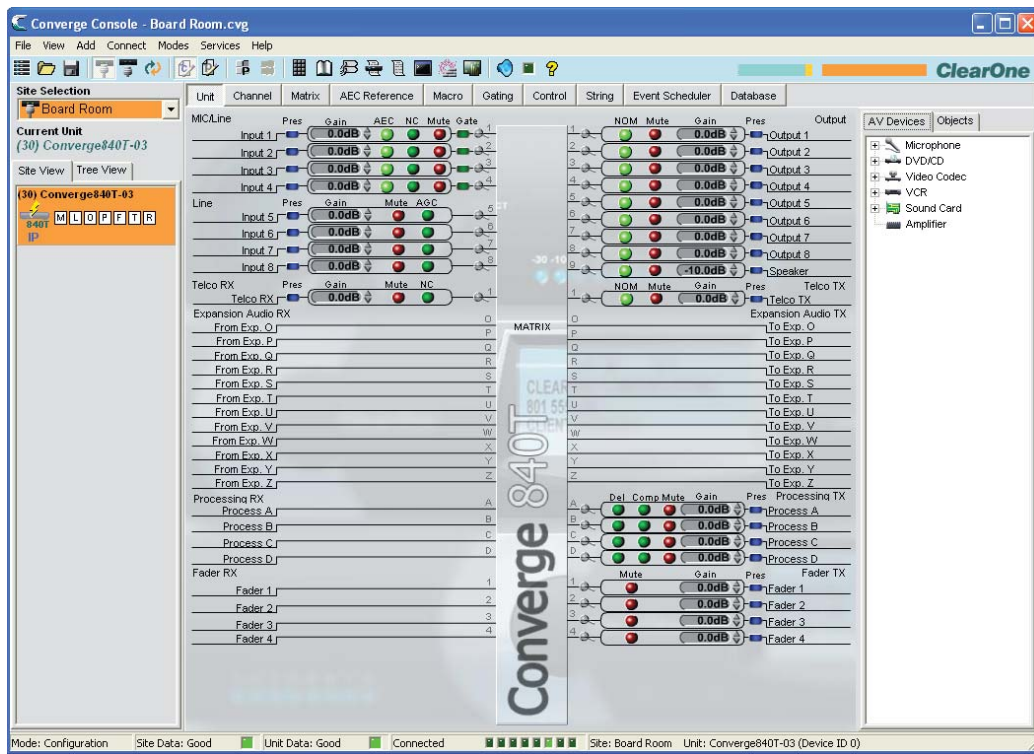
WEB BUILDER

Web Builder consists of User Console and Control Console. These consoles allow you to configure a subset of call management and mixing features for access through a web portal integrated into the Converge Pro firmware. The web portal can be accessed over IP with Microsoft's Internet Explorer (requires IE version 5.5 or later and Sun Microsystems Java Runtime Environment version 6.0 or higher).

User Console allows you to configure basic call functions, including on/off hook, redial, volume, and mute, for one or two Converge Pro units (840T and TH20 only). Control Console allows you to perform basic channel and mixing configuration tasks for all Converge Pro units.

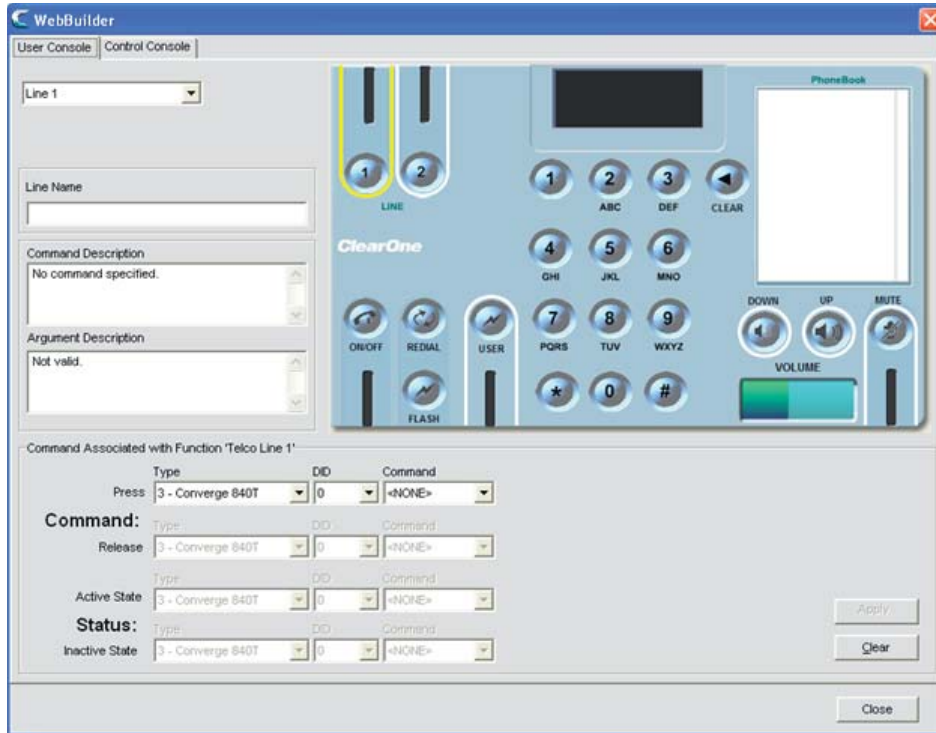
Accessing Web Builder

To access the web builder, select **Web Builder** from the **Services** menu, or press the **Web Builder**  button on the Console **Button Bar**.



Configuring User Console

The User Console tab allows you to configure the web version of Dialer, a software interface that emulates the functionality of Clearone's Tabletop Controller. User Console provides six user-programmable keys as described in the following sections.

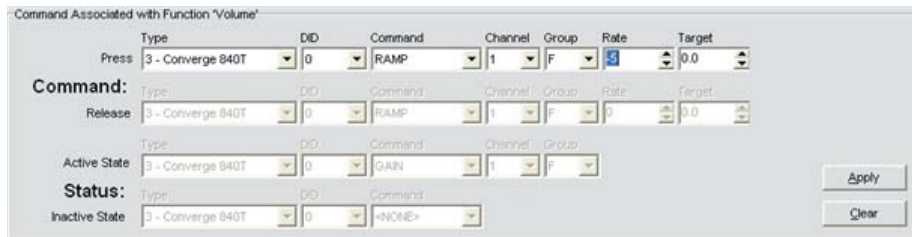


Select the key you want to program from the drop-down list in the upper left hand corner of the screen. Programmable keys include:

- Line 1
- Line 2
- User
- Volume Down
- Volume Up
- Mute

If you are configuring a **Line** or **User** button, enter a name for it in the **Line** (or **User**) **Name** field (optional).

The key selected determines the commands available in the **Command** drop-down lists in the **Command** section of the screen.



For example, the commands available for the volume buttons include **GAIN**, **MACRO**, and **RAMP**. When you select a command, the configurable parameters for that command appear as shown above. (For more information on the command editor, see Command Editor in the Control Tab topic.)

Select the **Type**, **DID** (device ID), and **Command** from the drop-down lists. After selecting a command and configuring its parameters, press the **Apply** button to save the button programming. To clear a command, press the **Clear** button.

For some commands, such as **MACRO**, the **Status** section of the command editor becomes active. **Status** controls the LED status indicator for the associated button based on the state conditions entered in the **Active State** (LED on) and **Inactive State** (LED off) rows of the **Status** section.

Type	DID	Command	Macro	Name
Press	3 - Converge 840T	0	MACRO	1
Release	3 - Converge 840T	0	MACRO	2
Active State	3 - Converge 840T	0	MACRO	3
Inactive State	3 - Converge 840T	0	MACRO	4

Pressing a programmed button in the Converge Pro **Web Portal** executes the command selected in the **Press** row of the **Command** section. Releasing a button executes the command selected in the **Release** row (if applicable for the programmed command).

Configuring Control Console

The **Control Console** provides eight fader groups (mixers) with gain sliders, mute buttons, and level meters. It also provides four user-programmable buttons. The fader groups can control multiple Converge Pro units in the site.

Type	DID	Command	Channel	Group	Position	Value
Press	3 - Converge 840T	0	LVLREPORT	1	F	1
Release	3 - Converge 840T	0	<NONE>			
Active State	3 - Converge 840T	0	<NONE>			
Inactive State	3 - Converge 840T	0	<NONE>			

Select the fader group or user key you want to program from the drop-down list in the upper left hand corner of the screen. For fader groups, you will also need to select **Gain**, **Mute**, or **Meter** from the second drop-down list.

NOTE: You can also select an element to program, such as a gain slider or user button, by selecting its graphical representation in the Control Console window. For example, in the screen shot above, the meter element for Fader Group 1 is selected. The LVLREPORT command associated with the meter will display real-time level of fader group on the Converge Pro 840T unit (DID 0).

The element selected determines the commands available in the **Command** drop-down lists in the **Command** section of the screen.

For example, the commands available for the mute buttons include **MACRO** and **MUTE**. When you select a command, the configurable parameters for that command appear as shown above. (For more information on the command editor, see **Command Editor** in the *Control Tab* topic.)

Select the **Type**, **DID** (device ID), and **Command** from the drop-down lists. After selecting a command and configuring its parameters, press the **Apply** button to save the button programming. To clear a command, press the **Clear** button.

For some commands, such as **MACRO**, the **Status** section of the command editor becomes active. Status controls the LED status indicator for the associated button based on the state conditions entered in the **Active State** (LED on) and **Inactive State** (LED off) rows of the **Status** section.

Changing the settings of a fader group element, or pressing a programmed button in the Converge Pro **Web Portal** executes the command selected in the **Press** row of the **Command** section. Releasing a button executes the command selected in the **Release** row (if applicable).

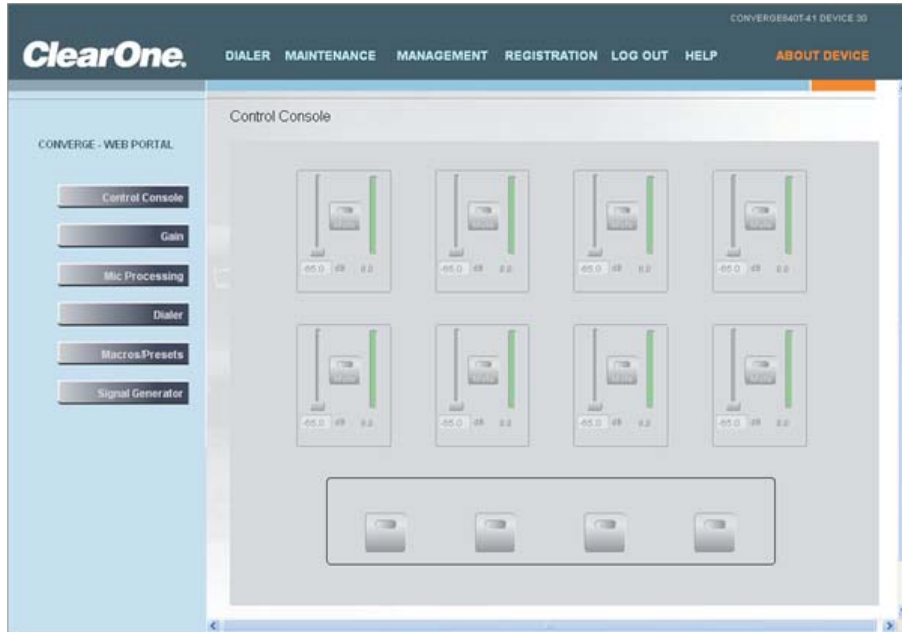
Accessing the Web Portal

After programming User Console and Control Console, you can access them using the Converge Pro web portal to monitor and manage audio conferences.

User access privileges to these web-based management tools are as follows:

- **Administrator:** Full web access.
- **Manager:** Web access to Dialer, Maintenance, Registration, About, and Help pages.
- **User:** Web access to the Dialer, Registration, About, and Help pages.

To open the web portal, enter the IP address of the Converge Pro unit you want to connect with. The web portal appears as shown below.



To access programmed call management functions, click on **DIALER**. To access programmed control console mixing functions, click on **MANAGEMENT** (shown above).

For additional information, please refer to the Table of Contents for these related topics:

- **Dialer**
- **Phonebook**
- **Macro Tab**
- **Mic Gating**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Output Settings**
- **Matrix Tab**

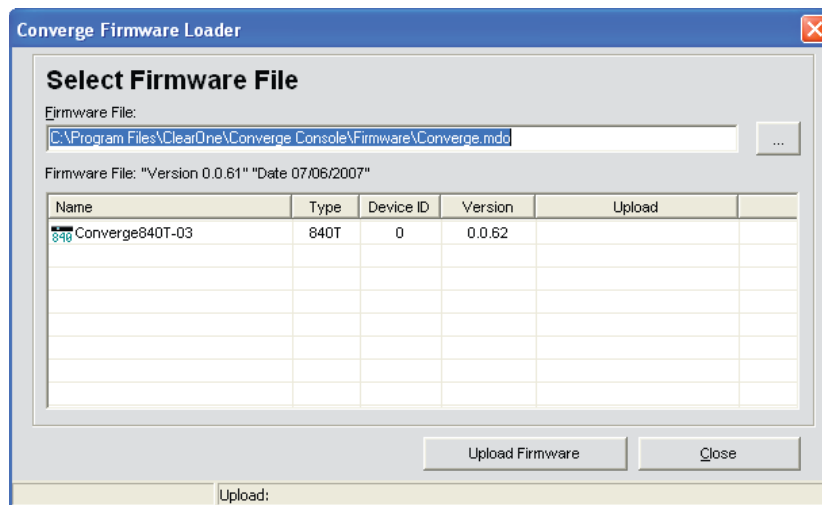
FIRMWARE LOADER

Firmware Loader allows you to upgrade the firmware in your Converge Pro unit when enhancements are released. All Converge Pro units (880, 840T, 8i, TH20) use the same firmware file: converge.mdo. When upgrading firmware, all units in the site are automatically updated simultaneously.

NOTE: Before upgrading firmware, save a copy of your site files using the Save or Save As options on the File menu.


Accessing Firmware Loader

To load firmware, click on the **Services** menu select **Firmware Loader**. The **Converge Firmware Loader** window appears as shown below.

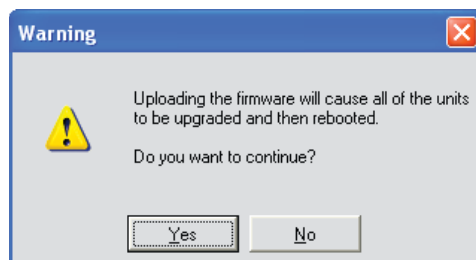


Loading Firmware

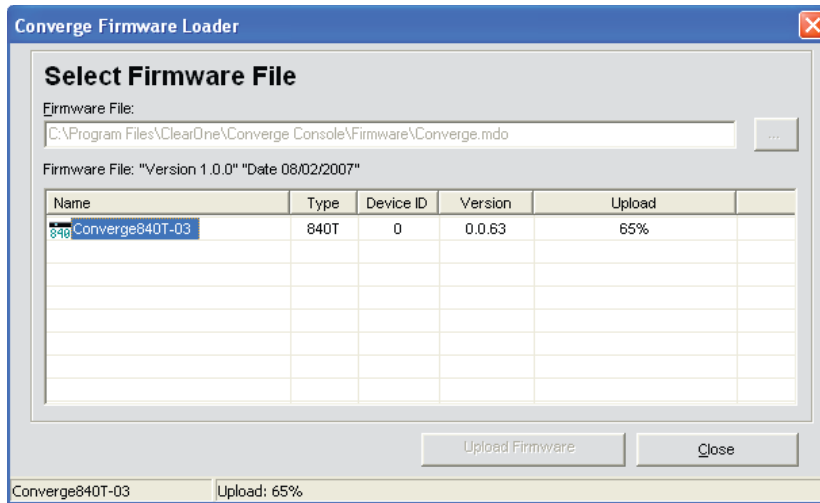
Firmware Loader automatically looks for Converge Pro firmware files in the default Converge Console directory.

Press the  button to locate firmware files stored in a different directory, or enter an explicit file path into the **Firmware File** entry field. All available firmware files in the chosen directory are displayed in the firmware file table.

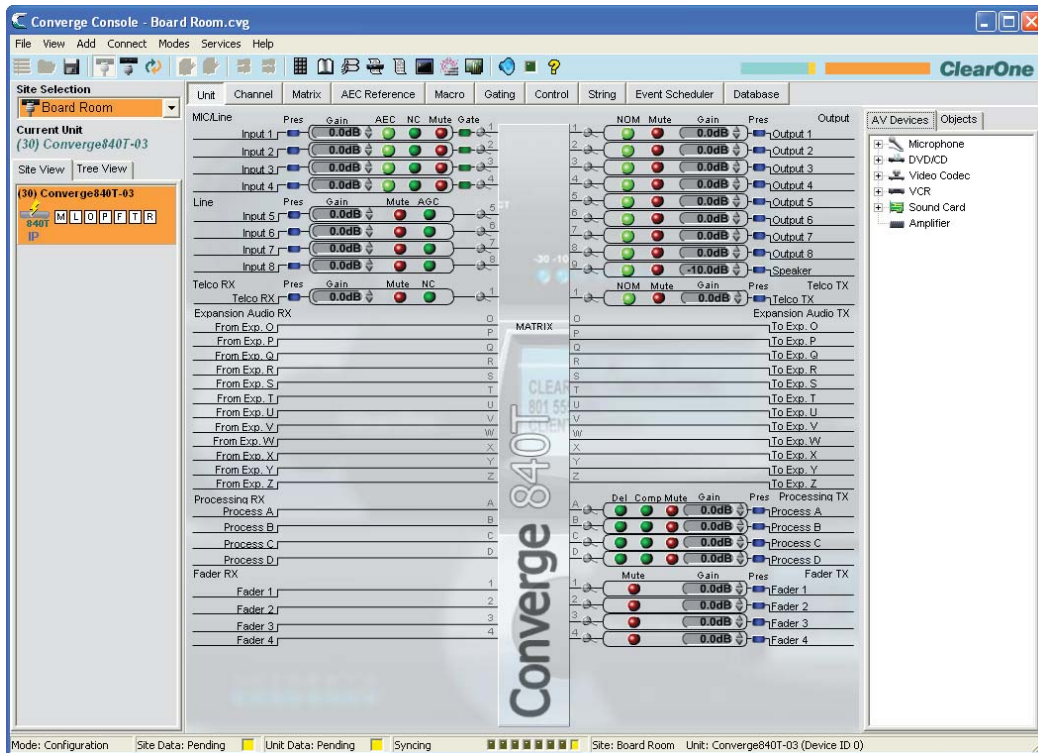
Once you have located the firmware file you want to load, select it from the firmware file table and click **Upload Firmware**. A warning dialog appears (shown below). Click **Yes** to proceed with the firmware upload.



The upload begins, and the Firmware Loader displays progress in the **Upload** column of the firmware file table, and in the Status Bar at the bottom of the window as shown below:



In addition, the LED indicators on the status bar in Console turn yellow to indicate the firmware load is in progress as shown below:



When the firmware load is complete, the unit reboots. The unit now has the selected firmware file loaded.

If you experience problems with firmware loads, please contact ClearOne Technical Support.

For additional information, please refer to the *Table of Contents* for these related topics:

- **Configure Unit Properties**
- **Configuration Mode Overview**
- **Customer Service and Support**

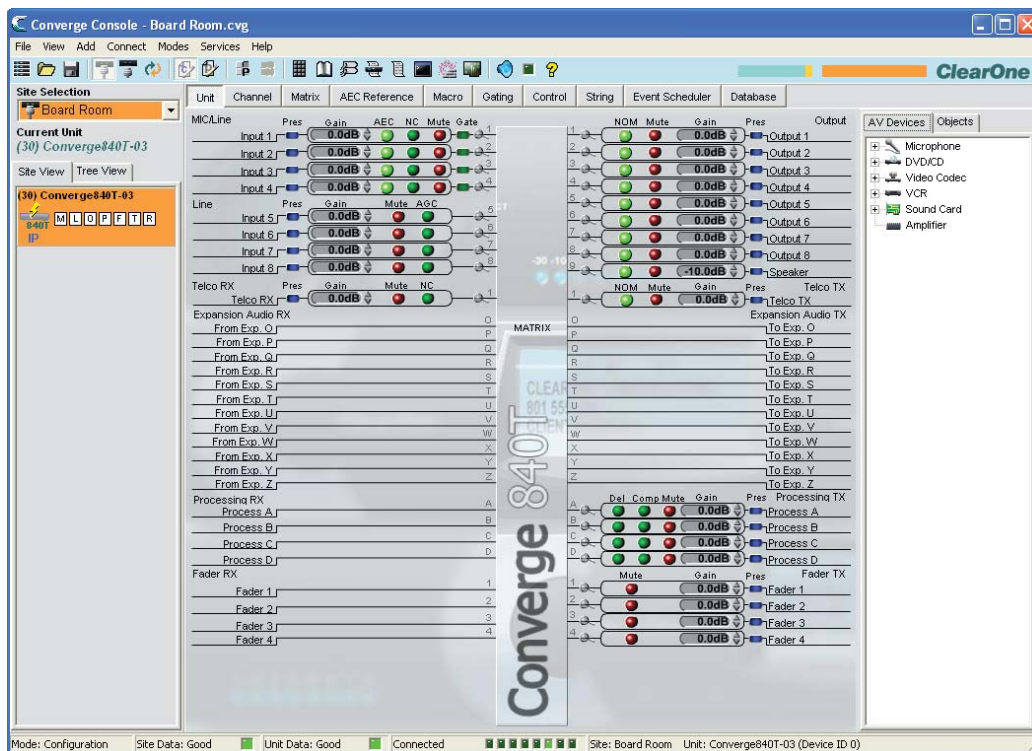
DEBUG CONSOLE

The Debug Console provides five tabs for monitoring system performance, testing and troubleshooting audio performance, and running system diagnostics:

- **Meter View**
- **Gate View**
- **Signal Generator**
- **System Checks**
- **System Check Config**

Accessing Debug Console

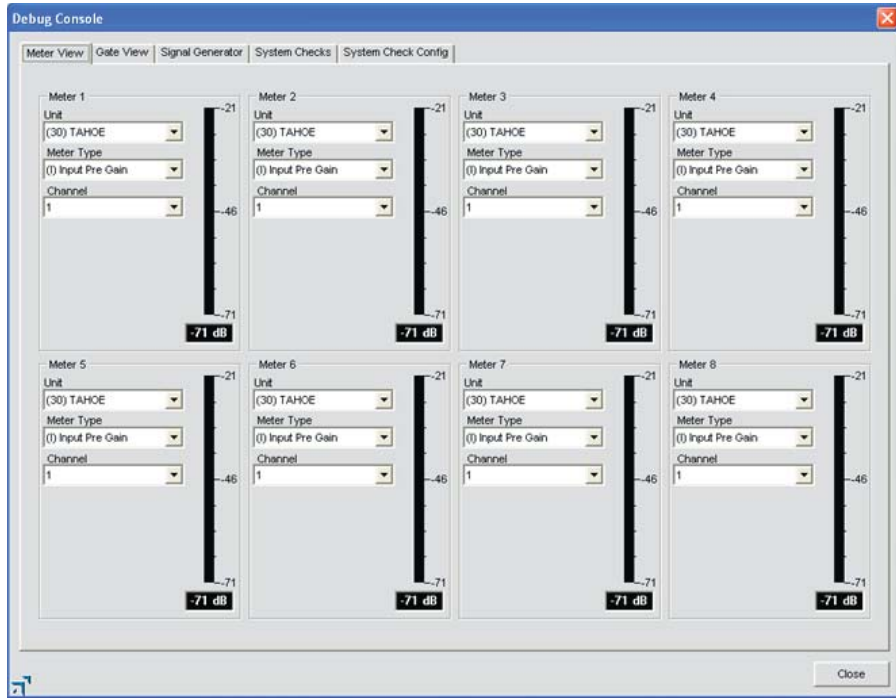
To access the debug console, select **Debug Console** from the **Services** menu, or press the **Debug Console** button on the Console **Button Bar**.



Debug console tabs are described in the following sections.

Meter View Tab

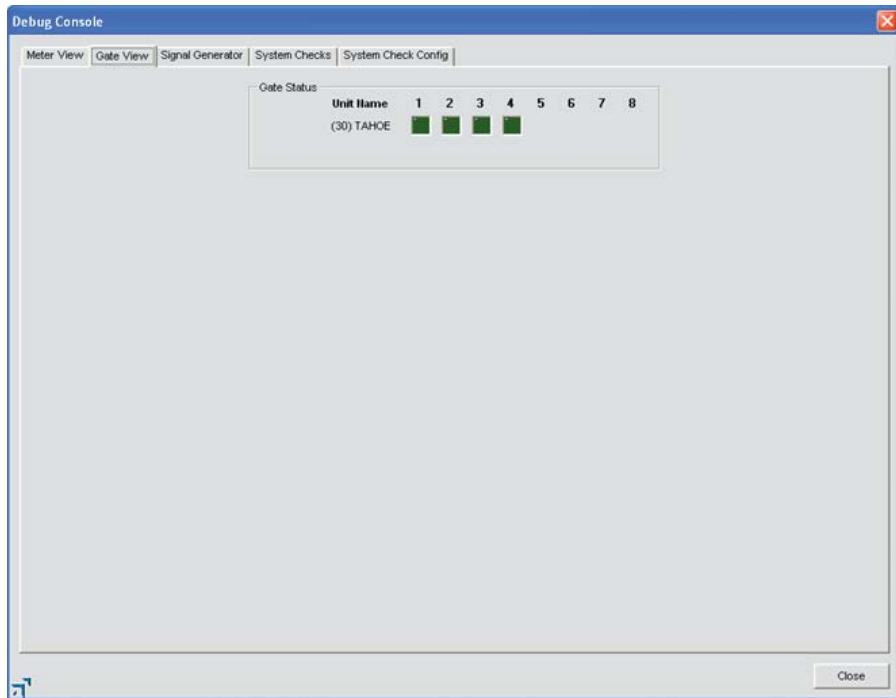
The **Meter View** tab provides eight user-configurable level meters for monitoring signal levels on any channel in a site.



To configure a meter, select the **Unit**, **Meter Type**, and **Channel** using the drop-down lists. Meter view provides a useful diagnostic tool for system-wide troubleshooting and configuration.

Gate View Tab

The **Gate View** tab shows real-time gating status, allowing you to monitor gating activity for the mics and gating groups for the currently connected Converge Pro unit.

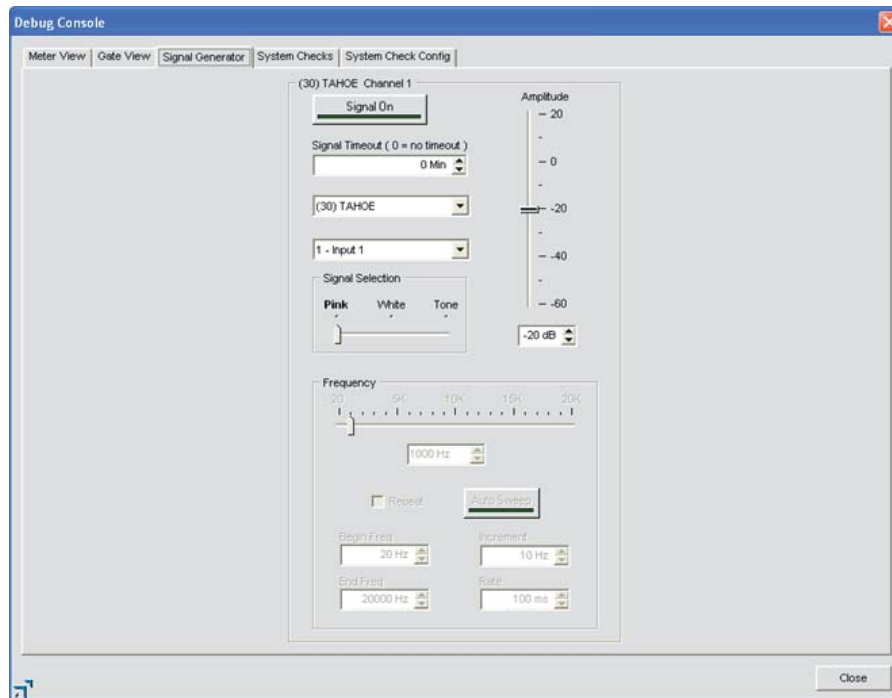


The gate indicator for each input is dark green in the gate-off condition and light green if the input is gated on.

Signal Generator

The **Signal Generator** tab enables you to generate test signals to audibly test signal paths, gain settings, routing, and channel configuration settings. The signal generator can also be used for noise masking in courtroom, clergy, and corporate applications.

NOTE: When the signal generator is on for any unit in the site, the **Signal Generator LED** on the Console Button Bar flashes green.



Test Signal Types

The signal generator provides three types of test signals: **Pink**, **White**, and **Tone**.

- **Pink Noise:** A test signal containing all the frequencies in a given audio spectrum, with equal energy in each octave. Pink noise is the default signal.
- **White Noise:** A test signal with equal energy distribution throughout a given frequency range.
- **Tone:** A sine-wave test signal with less than .03% distortion. Selecting **Tone** with the **Signal Selection** slider activates the **Frequency** configuration section of the tab.

Running a Signal Test

Use the following procedure to run a signal test:

1. Select the unit and channel to test using the unit and channel drop down lists.
2. Select the type of test tone using the **Signal Selection** slider.
3. Select the amplitude (volume) of the test tone using the **Amplitude** slider. The amplitude range is from -60 to +20dB. The default is -20dB.
4. Set the level for the test tone using the dB entry field or up/down arrows.
5. Set desired test tone duration using the **Signal Timeout** entry field.
6. For **Tone** signals, set the additional **Frequency** settings as explained in the next section.
7. Press the **Signal On** button to initiate the test signal on the selected unit and channel. The signal will continue using the specified settings until the **Signal Timeout** is reached, or the **Signal On** button is pressed again, whichever occurs first.

Tone Frequency Settings

Configure **Frequency** settings for tone tests as follows:

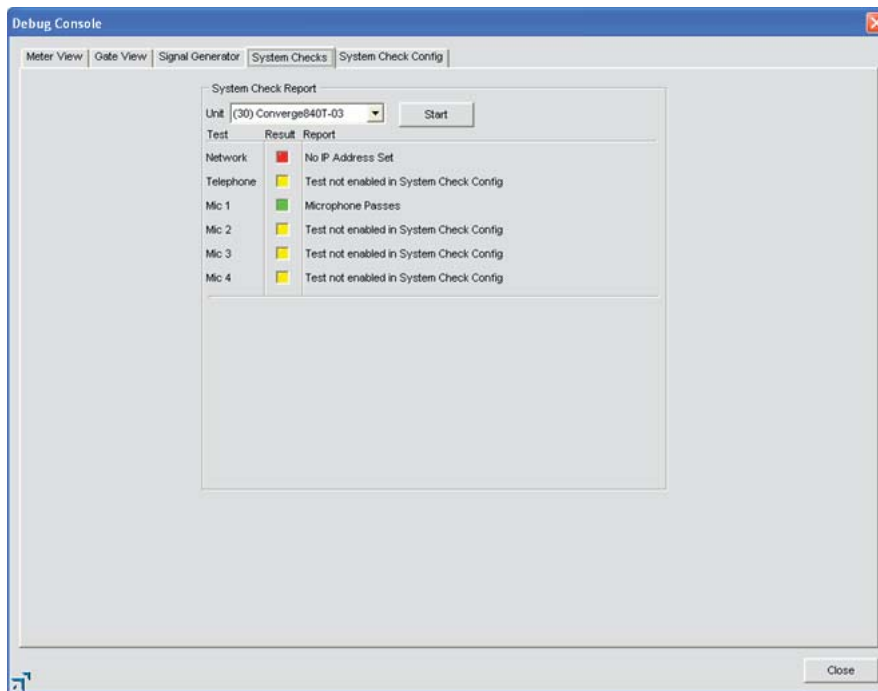
1. Select a tone frequency using the **Frequency** slider, or enter a frequency in the entry box.
2. Alternatively use the **Auto Sweep** button to sweep a range of frequencies using the **Begin Frequency**, **End Frequency**, **Increment**, and **Rate** settings. Select the **Repeat** checkbox if you want the sweep to continue in cycles.

NOTE: Use auto sweep to test the frequency response of a room and speakers, and to identify distortion or rattles produced by the speakers or speaker housings. Auto sweep moves the frequency of the signal generator from a low frequency to a high frequency at the specified rate. The **Frequency** slide control and readout reflect progress while the sweep is in progress. Sweep range is 20Hz—20kHz; increment range is 10Hz—20kHz, and the rate range is 10ms—2000ms. The default rate is 100ms.

3. Press the **Signal On** button to generate the tone test signal, or press the **Auto Sweep** button to initiate an auto sweep.

System Checks Tab

System Checks enable you to test network connections, telephone connections, microphones, and output channels for all Converge Pro units in a site. Running system checks can help identify component failures within the system using the tests you select on the System Check Config tab (described in the next section).

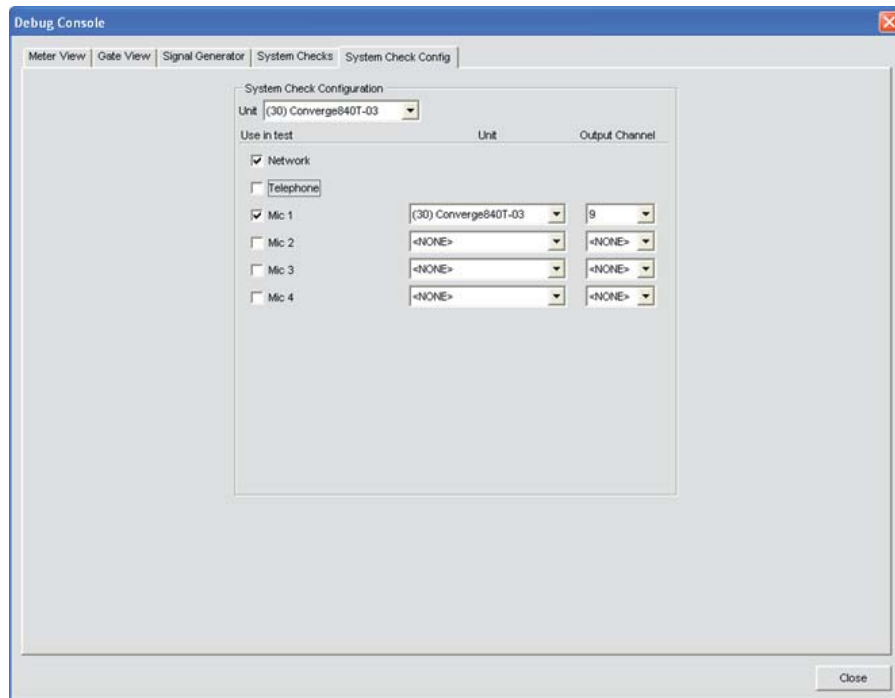


The test LEDs indicate test results as follows:

- **Red** = Test fails
- **Yellow** = Test not enabled in System Check Config
- **Green** = Test passes

System Check Config Tab

The **System Check Config** tab allows you to select and configure the diagnostic tests run on **System Checks** tab.



System Check Config settings include:

- **Unit (System Check Configuration):** Specifies the unit in the site that you want to test.
- **Network:** Select this check-box to test the IP configuration and network connectivity for the selected unit.
- **Telephone:** Select this check box to test **Telco Rx** and/or **Telco Tx** functionality (840T and TH20 only).
- **Mic 1-4 (840T), Mic 1-8 (880, 8i):** Select the check box(es) for the mic input channels that you want to test.
- **Unit:** Specifies the unit that will provide test audio to the speaker.
- **Output Channel:** Specifies the output channel that will provide test audio to the speaker.

Select the tests you want to run using the **Use in test** check boxes, and select the unit(s) and output(s) (with speakers connected) using the **Unit** and **Output Channel** drop-down lists. Execute the selected tests by pressing the **Start** button on the **System Checks** tab.

For additional information, please refer to the *Table of Contents* for these related topics:

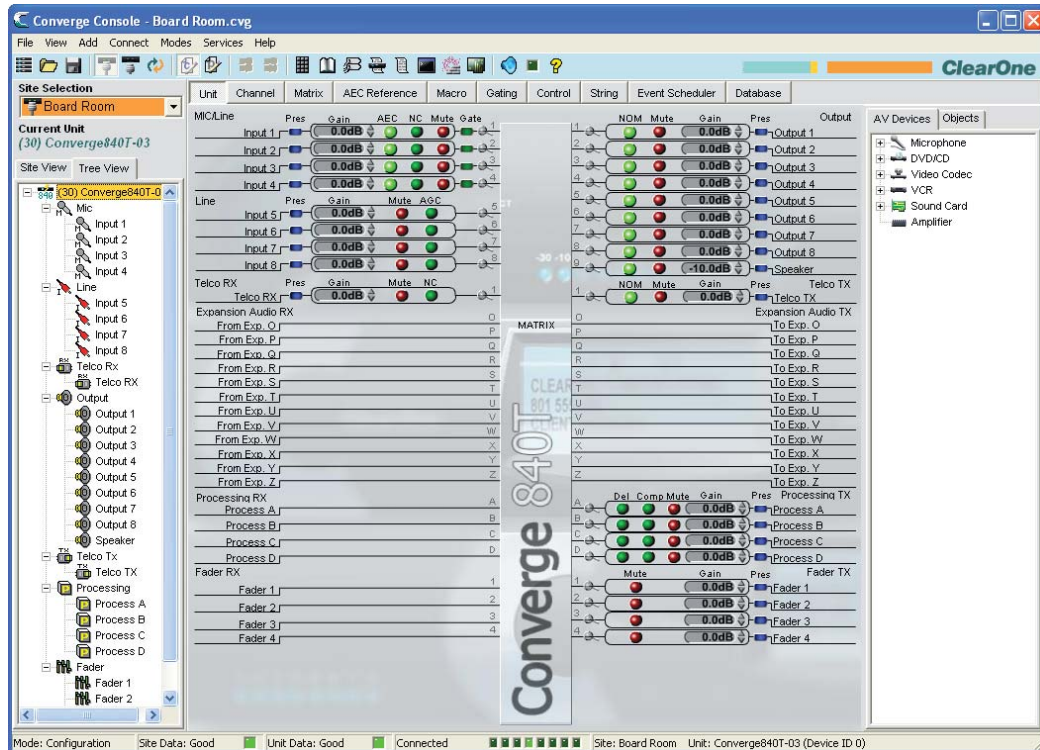
- **Device Log**
- **Event Log**
- **Mic Input Settings**
- **Line Input Settings**
- **Telco Rx Settings (840T and TH20)**
- **Telco Tx Settings (840T and TH20)**
- **Output Settings (880, 8i, TH20)**
- **Processing Settings**
- **Fader Settings**
- **Matrix Tab**

EXECUTE PRESETS

The Execute Presets command on the Services menu allows you to run presets while Console is in Configuration Mode.

NOTE: This command is not available while Console is in Preset Mode.

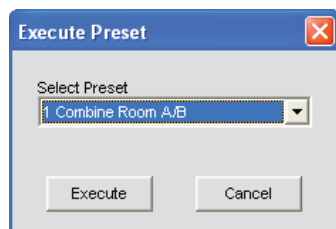
Accessing Execute Presets



From the Console main screen, click on the **Services** menu and select **Execute Preset** as shown below.



The Execute Preset dialog appears as shown below.



Select the preset you want to run from the drop-down list, then click **Execute** to run the preset or **Cancel** to return to Console.

You can also use macros to execute presets or multiple presets simultaneously. For more information, see the *Table of Contents* for the *Macro Tab* topic.

For additional information, please refer to the *Table of Contents* for these related topics:

- **Preset Mode**
- **Services Menu**
- **Configuration Mode**
- **Preset Mode Overview**
- **Macro Tab**

APPENDIX A: SERIAL COMMAND GUIDE

TYPE AND DEVICE IDS

Converge Pro Device Types and Device IDs by model are as follows:

Model	Device Type	Device ID Range
880	1	0-7
TH20	2	0-F
840T	3	0-7
8i	A	0-7

CONVENTIONS

This guide uses the following typographic conventions to describe Converge Pro serial command syntax:

Convention	Description
<X>	Parameters enclosed in < > indicate a mandatory parameter
[X]	Parameters enclosed in [] indicate an optional parameter
1-8	Parameters separated by a '-' indicate a range of allowable values
4,7,9	Parameters separated by a ',' indicate a list of allowable values
EREF	Words in UPPERCASE bold indicate command text
Device	Indicates the device type and device number on the Expansion Bus. It is composed of a device type character and a device ID character.

COMMAND FORM DESCRIPTION

The structure of serial commands is as follows:

<Device Type> <Device ID> <Command> [Values] <Carriage Return>

indicates the start of a command line, the Carriage Return terminates a command.

NOTE: Converge Pro serial commands can be either UPPERCASE or lowercase. Return values are always in UPPERCASE. In order for a command to be recognized by the RS-232 serial port, the command must be terminated by a carriage return.

For example, a command to disable mute for Mic 2 (input channel 2) on Converge 880 device "0" would have the command line **#10 MUTE 2 M 0**.

In this command line, 1 = the **Device Type** for Converge 880, 0 = the **Device ID** for unit 0, **MUTE** = Converge Pro serial command, 2 = MUTE command **Value** to un-mute mic channel 2, M = MUTE command **Value** that specifies a microphone input channel, 0 = MUTE command **Value** specifying that mute is OFF.

If an asterisk (*) is placed in the **Device Type** or **Device ID** fields, the command will apply to all units or all devices respectively. For example, a command with a **Device Type** = 1 and a **Device ID** = * would apply the command to all Converge 880 units. A command with a **Device Type** = * and a **Device ID** = 6 would apply the command to all Converge Pro units with a Device ID of 6.

If a command specifies "(Null to query in text)" in its **Value** table, leave a blank in the command line to query the current state of that value. For example, the command **#10 MUTE 2 M <blank>** would return the current mute state of Mic 2 on an Converge Pro 880 with a Device ID of 0.

GROUPS AND CHANNELS

All Converge Pro serial commands use common alpha and numeric designators to reference channel group, channel types, and other command values. Also, different channel groups have different allowable channel ranges, as shown in the following table.

Group	Alpha	Number	Converge 880 Channel Range	Converge TH20 Channel Range	Converge 840T Channel Range	Converge 8i Channel Range
Unknown	?	0	N/A	N/A	N/A	N/A
Inputs	I	1	1-12	1-2	1-8	1-12
Outputs	O	2	1-12	1-2	1-9(9 is the power amp)	N/A
Mic Input	M	3	1-8	N/A	1-4	1-8
Gating Group	G	4	1-8	N/A	1-8	1-8
Processing	P	5	1-8	N/A	1-4	1-8
Expansion Bus Audio Channels	E	6	O-Z	O-Z	O-Z	O-Z
Line Inputs	L	7	9-12	1-2	5-8	9-12
Expansion Bus Reference Channels	A	8	1-4	1-4	1-4	1-4
Unit	U	9	0 1 = LOG 2 = Site Wide	0 1 = LOG 2 = Site Wide	0 1 = LOG 2 = Site Wide	0 1 = LOG 2 = Site Wide
GPIO	Y	10	0	0	0	0
Matrix	X	11	0	0	0	0
Fader	F	12	1-4	N/A	1-4	1-4
Presets	S	13	1-32	1-32	1-32	1-32
Macros	C	14	1-255	1-255	1-255	1-255
Transmit	T	16	N/A	1	1	N/A
Receive	R	17	N/A	1	1	N/A
Dictionary	D	18	0	0	0	0
Phonebook	V	19	N/A	0	0	N/A
Virtual Reference	B	20	1 – 4	N/A	1 – 4	1 – 4
Timed Events	Q	21	0	0	0	0
Web	W	22	0	0	0	0

METER TYPE DEFINITIONS TABLE

Alpha	Numeric	Level Position for Mics	Level Position for Line Inputs	Level position for Outputs and Telco Tx	Level Position for Faders	Level Position for Processors	Level Position for Telco Rx
I	1	Input level	Input level	Input level	N/A	Level into Compressor	Input Level
A	2	Level after gain adjustment, but before filter	Level after gain adjustment	Level after gain adjustment	Level after gain adjustment	Level after Compressor	Level after gain adjustment
N	3	Level after filter but before gate (non-gated level)	N/A	N/A	N/A	Level after Gain Stage	N/A
G	4	Level after gate (gated level)	N/A	N/A	N/A	N/A	N/A
R	5	Echo Return Loss	N/A	N/A	N/A	N/A	Telco Echo Return Loss
E	6	Echo Return Loss Enhancement	N/A	N/A	N/A	N/A	Telco Echo Return Loss Enhancement
T	7	ERL + ERLE	N/A	N/A	N/A	N/A	TERL + TERLE
C	9	AGC	AGC	N/A	N/A	N/A	N/A
Y	10	Pre AGC peak level meter	Pre AGC peak level meter	N/A	N/A	N/A	N/A
Z	11	Post AGC peak level meter	Post AGC peak level meter	N/A	N/A	N/A	N/A

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SERIAL COMMANDS

Converge Pro serial commands are shown in bold, followed by the command form and argument details.

AA – Auto Answer Enable / Disable (840T & TH20 only)

This command selects/reports the setting of auto answer.

Command Form: **DEVICE AA** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

AAMB – Adaptive Ambient Mode

This command selects/reports the setting of adaptive ambient.

Command Form: **DEVICE AAMB** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = toggle (Null to query in text)	

AARINGS – Number of Rings to Auto Answer On (840T & TH20 only)

This command selects/reports the setting of the number of rings to auto answer.

Command Form: **DEVICE AARINGS** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	2 - 4 (Null to query in text)	

ACONN – Audible Connect / Disconnect Indication (840T & TH20 only)

This command selects/reports the status of the audible connect / disconnect indication.

Command Form: **DEVICE ACONN** <Channel> [Value].

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

ACONNLVL – Audible Connect / Disconnect Level (840T & TH20 only)

This command selects/reports the audible connect / disconnect indicator's level.

Command Form: DEVICE **ACONNLVL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Signed Float	2	-12.00 – 12.00 (Null to query in text)	dB

AD – Auto Disconnect Enable / Disable (840T & TH20 only)

This command selects/reports the setting of auto disconnect.

Command Form: DEVICE **AD** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = Loop Drop 2 = Call Progress 3 = Loop Drop + Call Progress (Null to query in text)	

ADCLIP – Audio Clipping

This command reports the channels that are currently clipping their audio signals. **This command is read only.** This command is implemented only for inputs.

Command Form: DEVICE **ADCLIP** [Values]

Argument	Type	Size	Values
Value	Bit Map of Inputs	2	XXXX XXXX XXXX XXXX → Input 1 (lsb) to 12 (msb) → Reserved (Null to query in text)
	Bit Map of Outputs	2	XXXX XXXX XXXX XXXX → Output 1 (lsb) to 13 (msb) → Reserved
	Bit Map of Processors	2	XXXX XXXX XXXX XXXX → Processor A (lsb) to H (msb) ----- → Reserved
	Bit Map of Faders	1	XXXX XXXX ----- → Faders 1 (lsb) to 4 (msb) ----- → Reserved
	Bit Map of Telco	1	XXXX XXXX → Telco RX → Telco TX ----- → Reserved

ADPRESENT – Audio Presence

This command displays the channels that currently have valid audio signals present. **This command is read only.**

Command Form: **DEVICE ADPRESENT** [Values]

Argument	Type	Size	Values
Value	Bit Map of Inputs	2	XXXX XXXX XXXX XXXX → Input 1 (lsb) to 12 (msb) → Reserved (Null to query in text)
	Bit Map of Outputs	2	XXXX XXXX XXXX XXXX → Output 1 (lsb) to 13 (msb) ... → Reserved
	Bit Map of Processors	2	XXXX XXXX XXXX XXXX → Processor A (lsb) to H (msb) ----- → Reserved
	Bit Map of Faders	1	XXXX XXXX ----- → Faders 1 (lsb) to 4 (msb) ----- → Reserved
	Bit Map of Telco	1	XXXX XXXX → Telco RX → Telco TX ----- → Reserved

AEC – Acoustic Echo Canceller Enable / Disable

This command selects/reports the setting of Acoustic Echo Canceller.

Command Form: **DEVICE AEC** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

AGC – Automatic Gain Control

This command selects/reports the setting of automatic gain control.

Command Form: **DEVICE AGC** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 3, 7 (I, M, L)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

AGCSET – Automatic Gain Control Adjust

This command selects/reports the settings of the Automatic Gain Control.

Command Form: DEVICE **AGCSET** <Channel> <Group> [Threshold Target Attack Gain]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 3, 7 (I, M, L)	
Threshold	Signed Integer	1	-50 – 0 (Null to query in text)	dB
Target	Signed Integer	1	-30 – 20	dB
Response Time	Unsigned Float	2	0.10 – 10.00	S
Gain	Unsigned Float	2	0.00 – 18.00	dB

AMBLVL – Ambient Level Adjust

This command selects/reports the ambient level.

Command Form: DEVICE **AMBLVL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Signed Float	2	-80.00 – 0.00 (Null to query in text)	dB

AMXDUET – Use AMX Duet Discovery

This command sets and reports the status of AMX Duet Discovery.

Command Form: DEVICE **AMXDUET** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Off 1 = On 2 = toggle (Null to query in text)	

AUDIOMASTER – Expansion Bus Audio Master Mode

This command reports the mode of the unit for control of the expansion bus audio.

Command Form: DEVICE **AUDIOMASTER** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	1 = Master 2 = Slave (Null to query in text)	

BAUD – Baud Rate

This command selects/reports the baud rate of the serial port.

Command Form: DEVICE **BAUD** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	9600, 19200, 38400, 57600, 115200 (Null to query in text)	

CALLDUR – Call Duration (840T & TH20 only)

This command indicates how long a call has lasted. If no call is in session, this will report 0. At the time of call termination, this command will automatically be sent out reporting the duration. **This command is read only.**

Command Form: DEVICE **CALLDUR** <Channel> <Duration>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	
Duration	String	8	String of format HR:MN:SS	

CALLERID – Reports Caller ID Information (840T & TH20 only)

This command reports Caller Identification Information. **This command is reportable only. It cannot be queried or set.**

Command Form: DEVICE **CALLERID** <Channel> <Number> <Argument>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved	Unsigned Integer	2	0	
Number	String	16	1 – 16 chars	
Label	String	16	1 – 16 chars	

CGROUP – Compressor Group Select

This command selects/reports the setting of the compressor group.

Command Form: DEVICE **CGROUP** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	5 (P)	
Value	Unsigned Integer	2	0 = none 1 – 4 (Null to query in text)	Compressor Group

CHAIR0 – Chairman Override Mode

This command selects/reports the setting of chairman override.

Command Form: DEVICE **CHAIR0** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

CLEAREFFECT – Clear Effect Wide Band Telco Emulation (840T & TH20 only)

This command enables / disables or reports the current status of the clear effect.

Command Form: **DEVICE CLEAREFFECT** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

CLOCK – Clock Set

This command sets or reports the current time.

Command Form: **DEVICE CLOCK** [Date Month Year Hours Minutes Seconds Day]

Argument	Type	Size	Values	Units
Date	Unsigned Integer	1	1 – 31	
Month	Unsigned Integer	1	1 – 12	
Year	Unsigned Integer	2	2000 – 2099 (NULL to Query in Text)	
Hours	Unsigned Integer	1	00 – 23	
Minutes	Unsigned Integer	1	00 – 59	
Seconds	Unsigned Integer	1	00 – 59	
Day of Week	Unsigned Integer	1	1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday	

COMPRESS – Compressor Adjust

This command selects/reports the settings of the compressor.

Command Form: **DEVICE COMPRESS** <Channel> [Threshold Ratio Attack Release Gain]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	5 (P)	
Threshold	Signed Integer	1	-60 – 20 (Null to query in text)	dB
Ratio	Unsigned Integer	1	1 – 20	
Attack	Unsigned Float	2	0.00 – 100.00	Ms
Release	Unsigned Integer	2	100 – 2000	Ms
Gain	Unsigned Float	4	0.00 – 20.00	dB

COMPSEL – Compression Select

This command selects/reports the compressor activation.

Command Form: DEVICE **COMPSEL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	5 (P)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

COUNTRY – Country Selection (840T & TH20 Only)

This command sets / reports the country for compliance.

Command Form: DEVICE **COUNTRY** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	1 = US / Canada 2 = Europe 3 = Mexico 4 = Australia 5 = South Africa 6 = Japan 7 = Brazil 8 = South Korea 9 = China 10 = Singapore 11 = Taiwan 12 = New Zealand 13 = India 14 = Hong Kong 15 = Malaysia 16 = Argentina (Null to query in text)	

CTRLMASTER – Control Master Mode

This command reports the mode of the unit for SNMP control.

Command Form: DEVICE **CTRLMASTER** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	1 = Master 2 = Slave (Null to query in text)	

DECAY – Decay Adjust

This command selects/reports the setting of the decay rate.

Command Form: DEVICE **DECAY** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	1 = Slow 2 = Medium 3 = Fast (Null to query in text)	

DEFAULT – Default The Unit

Sets the unit to factory defaults. **There is no query for this command.**

Command Form: **DEVICE DEFAULT**

No Arguments

DELAY – Delay Adjust

This command selects/reports the setting of delay time.

Command Form: **DEVICE DELAY** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	5 (P)	
Value	Unsigned Float	2	0.00 – 250.00 (Null to query in text)	Ms

DELAYSEL – Delay Select

This command selects/reports the delay activation of an assignable processing channel.

Command Form: **DEVICE DELAYSEL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	5 (P)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

DEVICENAME – Argument Identification Label

This selects/reports the Device Argument identification label of the specific channel.

COMMAND FORM: **DEVICE DEVICENAME** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 7 (I, O, M, L)	
Reserved	Unsigned Integer	2	0	
Label	String	12	1 – 12 characters CLEAR = clear the label (Null to query in text)	

DEVICESTYPE – Sets the Subtype of a Connected Device

This command enables/disables or reports the current type of device connected to an input or output.

Command Form: **DEVICE DEVICESTYPE** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 7 (I, O, M, L)	
Value	Unsigned Integer	2	(NULL to query in text)	

DEVICETYPE – Sets the Type of a Connected Device

This command enables / disables or reports the current type of device connected to an input or output.

Command Form: DEVICE **DEVICETYPE** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 7 (I, O, M, L)	
Value	Unsigned Integer	2	(NULL to query in text)	

DFLTM – Default Meter

This command selects/reports the setting of the default meter on the front panel.

Command Form: DEVICE **DFLTM** [Channel Group Position]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels (Null to query in text)	
Group	Group	1	1, 2, 3, 7, 16, 17 (I, O, M, L, T, R)	
Position	Meter Type	2	1 – 4, as applicable for group See Meter Type Definitions	

DIAL – DTMF Dialing (840T & TH20 only)

This command dials a DTMF sequence or reports back the last sequence dialed.

Command Form: DEVICE **DIAL** <Channel> [Number]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	
Number	String	40	1 – 40 Chars of '0' – '9', 'A' – 'D', '*', '#', ',' (Null to query last number dialed in text)	

DID – Device ID

This command reports the device id. **This command is read only except through the front panel.**

Command Form: DEVICE **DID** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	See Type And Device IDs (Null sent in text, Value returned)	

DSPVER – DSP Version

This command reports the version of the DSP code in the unit. **This command is read only.**

Command Form: DEVICE **DSPVER** <Value> [Time/Date]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 for Host 1 – 8 for Satellite 9 for Telco	
Time / Date	String	16	(Null to query in text)	

DTMFLVL – DTMF Tone Level (840T & TH20 only)

This command selects/reports the DTMF tone's level.

Command Form: **DEVICE DTMFLVL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Signed Float	2	-12.00 – 12.00 (Null to query in text)	dB

DTONELVL – Dial Tone Level

This command selects/reports the audible dial tone's level.

Command Form: **DEVICE DTONELVL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Signed Float	2	-12.00 – 12.00 (Null to query in text)	dB

DUPDATE – Download Update

This command reports the status of download updates.

Command Form: **DEVICE DUPDATE** [Channel Group Status Percent Done Message]

Argument	Type	Size	Values	Units
Channel	Unsigned Integer	1		
Group	Unsigned Integer	1		
Status	Unsigned Integer	1	(Null to query in text)	
Percent Done	Unsigned Integer	1		
Message	Char	60		

DVER – Command Dictionary Version

This command reports the version of the command dictionary being used by the unit. **This command is read only.**

Command Form: **DEVICE DVER** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	(Sent with a Null in text)	

ENETADDR – Ethernet Port IP Address

This command selects/reports the IP address of the Ethernet port on the unit.

Command Form: **DEVICE ENETADDR** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text)	

ENETDHCP – Ethernet DHCP Selection

This command selects/reports the use of DHCP of the Ethernet port on the unit.

Command Form: **DEVICE ENETDHCP** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = On 1 = Off 2 = Toggle (Null to query in text)	

ENETDNS – Ethernet DNS Selection

This command selects/reports the use of DNS of the Ethernet port on the unit.

Command Form: **DEVICE ENETDNS** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = On 1 = Off 2 = Toggle (Null to query in text)	

ENETDNSA – Ethernet DNS Server Address

This command selects/reports the DNS server IP address of the Ethernet port on the unit.

Command Form: **DEVICE ENETDNSA** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text)	

ENETDNSA2 – Ethernet DNS Server Address 2

This command selects/reports the alternate DNS server IP address of the Ethernet port on the unit.

Command Form: **DEVICE ENETDNSA2** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text)	

ENETDOMAIN – Ethernet Domain Argument

This command selects/reports the Domain Argument of the Ethernet port on the unit.

Command Form: **DEVICE ENETDOMAIN** [Value]

Argument	Type	Size	Values	Units
Value	String	64	(Null to query in text)	

ENETGATE – Ethernet Default Gateway Address

This command selects/reports the default gateway of the Ethernet port on the unit.

Command Form: **DEVICE ENETGATE** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text)	

ENETSUBN – Ethernet Subnet Mask

This command selects/reports the Subnet mask of the Ethernet port on the unit.

Command Form: DEVICE **ENETSUBN** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text)	

EREF – Expansion Bus Reference

This command selects an output or reports which output is the expansion bus reference.

Command Form: DEVICE **EREF** <Channel> [Value Channel Value Group]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Reference Channels in Groups and Channels	
Group	Group	1	8 (A)	
Value	Channel	1	0 = none See 2, 20 (O, B) in Groups and Channels (Null to query in text)	
Value	Group	1	0 for none or 2, 20 (N for none or O, B)	

FILTER – Filter Adjust

This command selects/reports the settings of a filter.

Command Form: DEVICE **FILTER** <Channel> <Group> <Node> [Type Frequency Gain/Slope Bandwidth/Subtype]

Argument	Type	Size	Values	Units	
Channel	Channel	1	See Groups and Channels		
Group	Group	1	3, 5 (M, P)		
Node	Unsigned Integer	1	Group 3 Group 5	1 – 4 1 – 15	
Type	Unsigned Integer	1	0 = None 1 = All Pass 2 = Low Pass 3 = High Pass 4 = Low Shelving 5 = High Shelving 6 = Parametric Equalizer 7 = CD Horn 8 = Bessel Crossover 9 = Butterworth Crossover 10 = Linkwitz-Riley Crossover 11 = Notch (Null to query in text)		
Frequency	Unsigned Float	4	Type 0 Type 1 – 6, 8 – 11 Type 7	0 (Null in text) 20.00 – 20000.00 500.00 – 5000.00	Hz
Gain/Slope	Signed Float	2	Type 0 – 3, 7, 11 Type 4 – 6 Type 8 – 9 Type 10	0 (Null in text) -15.00 – 15.00 12, 18, 24 12, 24	dB / dB per Octave
Bandwidth/Subtype	Unsigned Float	2	Type 0 – 5, 7 Type 6, 11 Type 8 – 10	0 (Null in text) 0.05 – 5.00 2 = Low Pass 3 = High Pass	Octaves / Type

FILTSEL – Filter Select

This command turns on and off the filters.

Command Form: DEVICE **FILTSEL** <Channel> <Group> <Node> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3, 5 (M, P)	
Node	Unsigned Integer	1	Group 3 Group 5	1 – 4 0xFF for all (* text) 1 – 15 0xFF for all (* text)
Value	Unsigned Integer	1	0 = Off 1 = On 2 = Toggle (Null to query in text)	

FLOW – Flow Control

This command selects/reports the flow control of the serial port on the unit. Hardware flow control is implemented using DTR and DSR.

Command Form: DEVICE **FLOW** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Off 1 = On 2 = Toggle (Null to query in text)	

FMP – First Mic Priority Mode

This command selects/reports first Mic priority mode.

Command Form: DEVICE **FMP** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	4 (G)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

FPGAVER – FPGA Version

This command reports the version of the FPGA code in the unit. **This command is read only.**

Command Form: DEVICE **FPGAVER** [Value]

Argument	Type	Size	Values	Units
Value	String	12	(Sent with a Null in text)	

GAIN – Gain Adjustment

This command changes or reports back the gain for a channel.

Command Form: **DEVICE GAIN** <Channel> <Group> [Value] [Absol/Rel]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Value	Signed Float	2	-99.90 – 99.90 ** (Null to query in text)	dB
Absol / Rel		0	A = Absolute R = Relative Null = Relative	

NOTE: Values indicate entry range only. Actual internal range of the gain stage is from –65 to 20. Absolute values will be limited to the internal gain range.

GATE – Gate Status

This command reports the gate status of Mics. **This command is read only.**

Command Form: **DEVICE GATE** [Value]

Argument	Type	Size	Values	Units
Value	Hexadecimal	4	Bits 0 – 7 represent gate status on Mics 1 – 8 (Null sent in text, Value returned)	

GHOLD – Gate Hold Time Adjust

This command selects/reports the setting of hold time.

Command Form: **DEVICE GHOLD** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Float	2	0.10 – 8.00 (Null to query in text)	S

GMODE – Gating Mode

This command selects/reports the setting of gating mode.

Command Form: **DEVICE GMODE** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	1 = Auto 2 = Manual On 3 = Manual Off (Null to query in text)	

GOVER – Gating Override

This command selects/reports the setting of gating override.

Command Form: **DEVICE GOVER** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

GPIOSTATUS – General Purpose Status

This command sets the state of a General Purpose Status Pin.

Command Form: **DEVICE GPIOSTATUS** Pin Port [Value]

Argument	Type	Size	Values	Units
Pin	Unsigned Integer	1	1 – 24 (Only user definable status pins.)	
Port	Unsigned Integer	1	1 – 2	
Value	Unsigned Integer	2	0 = High 1 = Low 2 = Toggle (NULL to query in text)	

GRATIO – Gate Ratio Adjust

This command selects/reports the setting of the gate ratio.

Command Form: **DEVICE GRATIO** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 – 50 (Null to query in text)	dB

GREPORT – Gate Report

This command selects/reports the mode of gate and audio presence status reporting.

Command Form: **DEVICE GREPORT** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Off 1 = On 2 = Toggle (Null to query in text)	

GRPSEL – Gating Group Select

This command selects/reports which Gating Group a microphone input is assigned.

Command Form: DEVICE **GRPSEL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Channel	2	See 4 (G) in Groups and Channels (Null to query in text)	

HOOK – Hook Flash (840T & TH20 only)

This command sends a hook flash. **There is no query for this command.**

Command Form: DEVICE **HOOK** <Channel>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	

HOOKD – Hook Flash Duration (840T & TH20 only)

This command selects/reports the hook flash duration.

Command Form: DEVICE **HOOKD** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	50 – 2000 (Multiples of 10 Ms only) (Null to query in text)	Ms

LABEL – Label

This selects/reports the label of the specific channel or the unit.

Command Form: DEVICE **LABEL** <Channel> <Group> [In/Out] [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 16, 17, 20 (I, O, M, G, P, E, L, A, F, S, C, T, R, B)	
Input / Output to Matrix	Unsigned Integer	2	Groups all but 6 Groups 6	0 0 = output 1 = input
Label	String	20	1 – 20 characters CLEAR = clear the label (Null to query in text)	

LCDCONTRAST – LCD Contrast

This command selects/reports the LCD Contrast Setting.

Command Form: DEVICE **LCDCONTRAST** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 (lightest) – 63 (darkest) (Null to query in text)	

LMO – Last Mic On Mode

This command selects/reports last Mic on mode.

Command Form: DEVICE **LMO** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	4 (G)	
Value	Unsigned Integer	2	0 = Off 1 - 8 = Mic 1 - 8 to be the last mic 0xFF (* in text) = Last Mic to stay on (Null to query in text)	

LOCALNUM – Local Number

This command sets or reports back the current value of the local number.

Command Form: DEVICE **LOCALNUM** <Channel> [Number]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	
Number	String	16	1 - 16 Chars of '0' - '9', 'A' - 'D', '*', '#', ',' (Null to query in text)	

LOCBLDG – Location: Building

This command sets/reports the location of the unit: Building string.

Command Form: DEVICE **LOCBLDG** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 - 63 Characters (Null to query in text)	

LOCCITY – Location: City

This command sets/reports the location of the unit: City string.

Command Form: DEVICE **LOCCITY** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 - 63 Characters (Null to query in text)	

LOCCNTRY – Location: Country

This command sets/reports the location of the unit: Country string.

Command Form: DEVICE **LOCCNTRY** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 - 63 Characters (Null to query in text)	

LOCCOMP – Location: Company

This command sets/reports the location of the unit: Company string.

Command Form: **DEVICE LOCCOMP** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 – 63 Characters (Null to query in text)	

LOCREGION – Location: Region

This command sets/reports the location of the unit: Region string.

Command Form: **DEVICE LOCREGION** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 – 63 Characters (Null to query in text)	

LOCROOM – Location: Room

This command sets/reports the location of the unit: Room string.

Command Form: **DEVICE LOCROOM** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 – 63 Characters (Null to query in text)	

LOCSITENAME – Location: Site Argument

This command sets/reports the location of the unit Site name.

Command Form: **DEVICE LOCSITENAME** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 – 64 Characters (Null to query in text)	

LOCSTATE – Location: State

This command sets/reports the location of the unit: State/Prefecture string.

Command Form: **DEVICE LOCSTATE** [Value]

Argument	Type	Size	Values	Units
Value	String	80	CLEAR = Clear current value 1 – 63 Characters (Null to query in text)	

LOGMASK – Device Log Mask

This command sets or reports the device event log mask.

Command Form: DEVICE LOGMASK [Value]

Argument	Type	Size	Values	Units
Value	Hexadecimal	4	X X X X X X X X X X X X X X → Reset → Errors → Password Access → Telco On/Off → Dial → Call Duration → System Checks → (reserved) → (reserved) → Default (Null to query in text)	

LVL – Level

This command reports the level of a channel. **This command is read only.**

Command Form: DEVICE LVL <Channel> <Group> <Position> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17, 20 (I, O, M, P, L, F, T, R, B)	
Position	Meter Type	2	See Meter Type Definitions	
Value	Signed Float	4	-99.99 – 99.99 (Sent with Null in text, Value returned)	dB

LVLREPORT – Level Report

This command selects/reports the status of level reporting for the specified channel.

Command Form: DEVICE LVLREPORT <Channel> <Group> <Position> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Position	Meter Type	2	See Meter Type Definitions	
Value	Unsigned Integer	4	0 = Off (Delete from list being reported) 1 = On (Add to list being reported) 2 = Toggle (Null to query in text)	

LVLREPORTEN – Level Report Enable

Enables level reporting for the unit.

Command Form: DEVICE LVLREPORTEN [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Turn off reporting but leave current list 1 = Turn on reporting 2 = Turn off reporting and clear the list (Null to query in text)	

MACRO – Macro Execution/Reporting

This command executes a specified macro or reports the last macro executed.

Command Form: **DEVICE MACRO** [Value]

Argument	Type	Size	Values	Units
Value	Channel	4	See 14 (C) in Groups and Channels (Null to query last macro ran in text)	

NOTE: The response will indicate successful execution of the macro, but it does not guarantee that each command in the macro was executed.

MANUFACTURER – Manufacturer Identification Label

This command selects/reports the model identification label of the specified channel.

Command Form: **DEVICE MANUFACTURER** <Channel> <Group> <Reserved> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 7 (I, O, M, L)	
Reserved	Unsigned Integer	2	0	
Label	String	16	1-16 characters CLEAR = clear the label (Null to query in text)	dB

MODEL – Model Identification Label

This command selects/reports the model identification label of the specified channel.

Command Form: **DEVICE MODEL** <Channel> <Group> <Reserved> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 7 (I, O, M, L)	
Reserved	Unsigned Integer	2	0	
Label	String	16	1-16 characters CLEAR = clear the label (Null to query in text)	dB

MAX – Maximum Gain Setting

This command changes or reports back the maximum gain setting for an input, output or assignable processing block.

Command Form: **DEVICE MAX** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Value	Signed Float	2	-65.00 – 20.00 (Null to query in text)	dB

MIN – Minimum Gain Setting

This command changes or reports back the minimum gain setting for a channel.

Command Form: DEVICE **MIN** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Value	Signed Float	2	-65.00 – 20.00 (Null to query in text)	dB

MINMAX – Minimum and Maximum Gain Setting

This command changes or reports back the minimum and maximum gain setting for a channel.

Command Form: DEVICE **MINMAX** <Channel> <Group> [Min Max]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Min	Signed Float	2	-65.00 – 20.00 (Null to query in text)	dB
Max	Signed Float	4	-65.00 – 20.00	dB

MLINE – Mic / Line Coarse Gain Setting

This command selects/reports the setting of coarse gain.

Command Form: DEVICE **MLINE** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = 0 dB 7 = 7 dB 14 = 14 dB 21 = 21 dB 28 = 28 dB 35 = 35 dB 41 = 41 dB 50 = 50 dB 56 = 56 dB (Null to query in text) (No other values are valid and accepted)	

MMAX – Maximum Number of Microphones

This command selects/reports the maximum number of microphones for a Gating Group.

Command Form: DEVICE **MMAX** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	4 (G)	
Value	Unsigned Integer	2	0 = Unlimited 1 - 8 = Maximum # of Mics (Null to query in text)	

MTRX – Matrix Routing

This command selects/reports the matrix routing of an input to an output.

Command Form: **DEVICE MTRX** <Src. Ch.> <Src. Gp.> <Dest. Ch.> <Dest. Gp.> [Value]

Argument	Type	Size	Values	Units
Source Channel	Channel	1	See Groups and Channels	
Source Group	Group	1	1, 3, 5, 6, 7, 12, 17 (I, M, P, E, L, F, R)	
Destination Channel	Channel	1	See Groups and Channels	
Destination Group	Group	1	2, 5, 6, 12, 16, 20 (O, P, E, F, T, B)	
Value	Unsigned Integer	4	0 = Cross point off 1 = Cross point on (Not Valid for Mic Sources) 2 = Toggle (Not Valid for Mic Sources) 3 = Non Gated (Mic Sources Only) 4 = Gated (Mic Sources Only) 5 = Pre-AEC (Mic Sources Only) 6 = Routing Prohibited (Cross point is off and may not be turned on) (Null to query in text)	

MTRX2 – Matrix 2

This command sets the cross points for an entire input.

Command Form:

DEVICE MTRX2 <Src. Ch.> <Src. Gp.> [<Cross Point 1 H><Cross Point 1 L><Cross Point 2 H><Cross Point 2 L><Cross Point 3 H><Cross Point 3 L>]

Argument	Type	Size	Values	Units
Source Channel	Channel	1	See Groups and Channels	
Source Group	Group	1	1, 3, 5, 6, 7, 12, 17, 20 (I, M, P, E, L, F, R, B)	
Reserved		2	0	
Cross point 1 High (Gated Mics & all other inputs)	Hexadecimal	4	Bit mask of columns 31 - max	
Cross point 1 Low (Gated Mics & all other inputs)	Hexadecimal	4	Bit mask of columns 0 – 31	
Cross point 2 High (Non Gated Mics)	Hexadecimal	4	Bit mask of columns 31 - max	
Cross point 2 Low (Non Gated Mics)	Hexadecimal	4	Bit mask of columns 0 – 31	
Cross point 3 High (Pre-AEC Mics)	Hexadecimal	4	Bit mask of columns 31 - max	
Cross point 3 Low (Pre-AEC Mics)	Hexadecimal	4	Bit mask of columns 0 – 31	

NOTE: A microphone cannot be routed in more than one way to the same output.

MTRXCLEAR – Clear Matrix

Clears the ENTIRE matrix for the unit. **There is no query for this command.**

Command Form: **DEVICE MTRXCLEAR**

No Arguments

MTRXLVL – Matrix Attenuation Adjust

This command selects/reports the matrix level at the cross point.

Command Form:

DEVICE MTRXLVL <Src. Ch.> <Src. Gp.> <Dest. Ch.> <Dest. Gp.> [Value] [A/R]

Argument	Type	Size	Values	Units
Source Channel	Channel	1	See Groups and Channels	
Source Group	Group	1	1, 3, 5, 6, 7, 12, 17 (I, M, P, E, L, F, R)	
Destination Channel	Channel	1	See Groups and Channels	
Destination Group	Group	1	2, 5, 6, 12, 16, (O, P, E, F, T)	
Value	Signed Float	4	-99.00 – 99.00 ** (Null to query in text)	dB
Absol / Rel		0	A = Absolute R = Relative Null = Relative	

NOTE: Values indicate entry range only. Actual internal range of the matrix attenuation is from -60 to +12dB, and absolute values are limited to the internal gain range.

MUTE – Mute

This command selects/reports the setting of mute on a channel.

Command Form: **DEVICE MUTE** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

NAME – Unit & NETBIOS Name

This command sets/reports the name of the unit which is also used for its NETBIOS name.

Command Form: **DEVICE NAME** [Value]

Argument	Type	Size	Values	Units
Value	String	16	1 – 15 Characters (Null to query in text)	

NCD – Noise Cancellation Depth Adjust

This command selects/reports the setting of the Noise Cancellation.

Command Form: **DEVICE NCD** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3, 17 (M, R)	
Value	Unsigned Integer	2	6 – 15 (Null to query in text)	dB

NCESEL – Noise Cancellation Select

This command selects/reports the setting of the Noise Cancellation for each microphone channel.

Command Form: **DEVICE NCESEL** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3, 17 (M, R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

NLP – Non Linear Processing Adjust

This command selects/reports the setting of the Non-linear processing for each microphone channel.

Command Form: **DEVICE NLP** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = Soft 2 = Medium 3 = Aggressive (Null to query in text)	

NOM – Number of Open Microphones Mode

This command selects/reports the setting of Number of Open Microphones (NOM) on output channels.

Command Form: **DEVICE NOM** <Channel> <Group> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	2, 16 (O, T)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

NTPSRV – NTP Network Time Server Address

This command selects/reports the IP addresses of the NTP Time Server the unit's NTP client requests time status from.

Command Form: **DEVICE NTPSRV** [Value 1 Value 2]

Argument	Type	Size	Values	Units
Value 1	IP Address	4	(Null to query in text)	
Value 2	IP Address	4		

NULL – Null the Line (840T & TH20 only)

This command nulls the line. **There is no query for this command.**

Command Form: DEVICE NULL <Channel>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	

OFFA – Off Attenuation Mode

This command selects/reports the off attenuation value of a Mic channel.

Command Form: DEVICE OFFA <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Float	2	0.00 – 60.00 (Null to query in text)	

PAA – PA Adaptive Mode

This command selects/reports PA adaptive mode for the specified Mic.

Command Form: DEVICE PAA <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

PBDIAL – Dial a PB Entry by Argument (840T & TH20 only)

This command dials a speed dial number by name. **There is no query for this command.**

Command Form: DEVICE PBDIAL <Channel> <Label>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved	Unsigned Integer	2	0	
Label	String	16	1 – 16 chars	

PHONEBOOKADD – Adds an Entry to the Phonebook (840T & TH20 only)

This command saves an entry in the phonebook. **There is no query for this command.** No two entries can share the same label. An argument error will be returned if an entry already has the name. To change an entry, you must first delete it and then add it again. If label is blank, the first 20 characters of the number will be used as the label. The **Number** argument must not be blank. If an entry already exists with the assigned speed dial it will be overwritten. The entries are alphabetized based on Label.

Command Form: DEVICE PHONEBOOKADD <ID Number Label>

Argument	Type	Size	Values	Units
Speed Dial	Unsigned Integer	4	0 for not assigned to a speed dial 1 – 20	
Number	String	44	1 – 44 chars '0' – '9', 'A' – 'D', '*', '#'	
Label	String	16	1 – 16 chars	

PHONEBOOKCNT – Counts Entries in the Phonebook (840T & TH20 only)

This command queries the number of entries in the phonebook. **This command is query only.**

Command Form: DEVICE **PHONEBOOKCNT** <Value>

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 – 20	

PHONEBOOKDEL – Deletes an Entry in the Phonebook (840T & TH20 only)

This command deletes an entry in the phonebook. **There is no query for this command.**

Command Form: DEVICE **PHONEBOOKDEL** <Label>

Argument	Type	Size	Values	Units
Label	String	16	1 – 16 chars	

PHONEBOOKREAD – Queries the Phonebook by Index (840T & TH20 only)

This command queries an entry in the phonebook. **This command is query only.**

Command Form: DEVICE **PHONEBOOKREAD** <Index> [Speed Number Label]

Argument	Type	Size	Values	Units
Index	Unsigned Integer	2	0 – 19 (Must be less than the Number of Phone Book Entries)	
Speed Dial	Unsigned Integer	2	0 for not assigned to a speed dial 1 – 20 (NULL to query in text)	
Number	String	44	1 – 44 chars '0' – '9', 'A' – 'D', '*', '#'	
Label	String	16	1 – 16 chars	

PP – Phantom Power

This command selects/reports the setting of phantom power.

Command Form: DEVICE **PP** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

PRESET – Preset Execution/Reporting

This command selects/reports the state of a preset.

Command Form: DEVICE **PRESET** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	0 (Binary)/Null (Text) = Query Last Preset Ran See Groups and Channels	
Group	Group	1	13 (S)	
Value	Unsigned Integer	2	0 = Set preset state to off 1 = Set state to on and execute if not already on 2 = Execute and return state to off (Null to query current state in text)	

PRGSTRING – Program String

This command sets/reports a programmed string.

COMMAND FORM: *DEVICE PRGSTRING* <ID> [Value]

Argument	Type	Size	Values	Units
ID	Unsigned Integer	4	0 – 7	
Value	String	80	CLEAR = Clear current value 1 – 80 Chars (Null to query in text) Special Characters: \a = alert \b = backspace \f = form feed \n = new line \r = carriage return \t = horizontal tab \v = vertical tab \ = backslash	

PTTTHRESHOLD – Push to Talk Threshold

This command selects/reports the setting of the push to talk threshold for a microphone.

Command Form: *DEVICE PTTTHRESHOLD* <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Float	2	-100 to 0 (Null to query in text)	dB

PUSHTOTALK – Push to Talk

This command selects/reports the setting of push-to-talk for a microphone.

Command Form: *DEVICE PUSHTOTALK* <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

RAMP – Ramp Gain Adjustment

This command starts / stops the gain ramp for an input, output or assignable processing block. **There is no query associated with this command.**

Command Form: *DEVICE RAMP* <Channel> <Group> <Rate> [Target]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 2, 3, 5, 7, 12, 16, 17 (I, O, M, P, L, F, T, R)	
Rate	Signed Integer	1	-50 – 50 If value=0, the ramp will stop. If value< 0, the gain will ramp down. If value>0, the gain will ramp up.	dB / s
Target	Signed Integer	1	-65 – 20 If NULL in text or 0x80 in binary, the ramp will use the channel's maximum and minimum for a target.	dB

REDIAL – Redial the Last Number (840T & TH20 only)

This command redials the last number. **There is no query for this command.**

Command Form: DEVICE REDIAL <Channel>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved		2	0	

REFSEL – Reference Select for PA Adaptation & AEC (880, 840T, 8i Only)

This command selects/reports which output or expansion bus reference is used for a Mic input as a reference for power amp adaptation mode and acoustic echo cancellation where applicable.

Command Form: DEVICE REFSEL <Channel> [Ref. Group Ref. Channel]

Argument	Type	Size	Values	Units
Channel	Channel	1	See 3 (M) in Groups and Channels	
Group	Group	1	3 (M)	
Reference Group	Group	1	2, 8, 20 (O, A, B)	
Reference Channel	Channel	1	See Groups and Channels (Null to query in text)	

REFSET – Reference Channel Set Up (880, 840T, 8i Only)

This command selects/reports the output the reference channel tracks.

Command Form: DEVICE REFSET <Channel> [Reference Output]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	20 (B)	
Value	Reference Output	2	0 = none See 2 (O) in Groups and Channels (Null to query in text)	

RESET – Reset

Resets the unit. **There is no query for this command.**

Command Form: DEVICE RESET

No Arguments

RING – Ring Indication (840T & TH20 only)

This command indicates a ringing line. **This command is reportable only. It cannot be queried or set.**

Command Form: DEVICE RING <Channel> <Value>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Ring Cycle Ended 1 = Ring Cycle Started	

RINGEREN – Audible Ring Enable (840T & TH20 only)

This command sends/reports the use of an audible ring.

Command Form: DEVICE RINGEREN <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

RINGERLVL – Audible Ring Level (840T & TH20 only)

This command selects/reports the audible ring's level.

Command Form: DEVICE RINGERLVL <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Signed Float	2	-12.00 – 12.00 (dB) (Null to query in text)	

RINGERSEL – Audible Ring Melody Selection (840T & TH20 only)

This command sends/reports the audible ring melody.

Command Form: DEVICE RINGERSEL <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	1 – 3 (Null to query in text)	

RINGERTEST – Audible Ring Melody Test (840T & TH20 only)

This command plays the current audible ringer melody. **This command is executable only. There is no query.**

Command Form: DEVICE RINGERTEST <Channel>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Reserved	Unsigned Integer	2	0	

RXBOOST – Receive Boost (840T & TH20 only)

This command selects/reports the receive boost status.

Command Form: DEVICE RXBOOST <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0, 3, 6, 9, or 12 (Null to query in text)	dB

RXBSTEN – Receive Boost Enable (840T & TH20 only)

This command selects/reports the receive boost status.

Command Form: DEVICE **RXBSTEN** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

SERECHO – Serial Echo

This command selects/reports the serial echo of the RS-232 port.

Command Form: DEVICE **SERECHO** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Off 1 = On 2 = Toggle (Null to query in text)	

NOTE: The unit will return the updated state of the last selection in the same form as the command.

SFTYMUTE – Safety Mute

This command selects/reports the state of the safety mute. Safety mute holds all outputs in a muted state. It used for syncing to a site document to avoid feedback or blown speakers until the unit is in a settled state.

Command Form: DEVICE **SFTYMUTE** [Value]

Argument	Type	Size	Values	Units
Value	Channel	4	0 = off 1 = on 2 = toggle (Null to query in text)	

SIGGEN – Signal Generator

This command selects/reports of the signal generator activation.

Command Form: DEVICE **SIGGEN** [Channel Group Type Amplitude Frequency]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels (Null to query in text)	
Group	Group	1	1, 3, 7 (I, M, L)	
Type	Unsigned Integer	2	1 = Pink Noise 2 = White Noise 3 = Tone	
Amplitude	Signed Float	4	-60.00 – 20.00	dB
Frequency	Unsigned Float	4	Type 1 – 2 0 (Null in text) Type 3 20.00 – 20000.00	Hz

SIGGENEN – Signal Generator Enable

This command selects/reports of the signal generator activation.

Command Form: **DEVICE SIGGENEN** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Off 1 = On 2 = Toggle (Null to query in text)	

SIGGENSWEEP – Signal Generator Sweep

This command starts the signal generator with a tone and does a sweep. If **Repeat** is 0, the signal generator will turn off after the sweep. If **Repeat** is 1, the signal generator will turn off after signal generator timeout. To stop the sweep, send a SIGGENEN command with a 0. During the sweep, the box will send out updated SIGGEN commands.

Command Form:

DEVICE SIGGENSWEEP <Channel> <Group> <Amplitude> <Start Frequency> <End Frequency>
<Increment Frequency> <Rate> <Repeat>

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	1, 3, 7 (I, M, L)	
Amplitude	Signed Float	2	-60.00 – 20.00	dB
Start Frequency	Unsigned Float	4	20.00 – 20000.00	Hz
End Frequency	Unsigned Float	4	20.00 – 20000.00 (must be greater than the start)	Hz
Increment Frequency	Unsigned Float	4	1.00 – 20000.00	Hz
Rate	Unsigned Integer	2	10 – 2000 ms	Hz
Repeat	Unsigned Integer	2	0 = repeat off 1 = repeat on	

SIGTOUT – Signal Generator Time Out

Sets the signal generator time out for the unit.

Command Form: **DEVICE SIGTOUT** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = Disable 1 – 30 (Null to query in text)	Min

SLVL – Speech Level Control

This command selects/reports the setting of Speech Level Control.

Command Form: **DEVICE SLVL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	3 (M)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

SMTPSRV – SMTP Mail Server Address

This command selects/reports the IP address of the SMTP Mail server, and the Email Address the unit's SMTP client sends messages to.

Command Form: DEVICE **SMTPSRV** [Value Address]

Argument	Type	Size	Values	Units
Value	IP Address	4	(Null to query in text) (0.0.0.0 Clears IP and String)	
Address	String	40	1 – 40 characters (Null to query in text)	

SNMPMNGRIP – SNMP Manager Host IP Address

This command selects/reports the IP address of the SNMP Manager.

Command Form: DEVICE **SNMPMNGRIP** [Value]

Argument	Type	Size	Values	Units
Value	IP Address	4	IP Address of SNMP Manager to send Traps to (Null to query in text)	

SNMPMNGRPORT – SNMP Manager Notification Port

This command selects/reports the SNMP Trap port for SNMP Manager.

Command Form: DEVICE **SNMPMNGRPORT** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	1-255 (Null to query in text)	

SNMPREADCOMM – SNMP Read Community String

This command selects/reports the SNMP read community string.

Command Form: DEVICE **SNMPREADCOMM** [Value]

Argument	Type	Size	Values	Units
Value	String	30	Read Community validation string (GET data) (Null to query in text: defaults to "public")	

SNMPWRITECOMM – SNMP Write Community String

This command selects/reports the SNMP Write Community String.

Command Form: DEVICE **SNMPWRITECOMM** [Value]

Argument	Type	Size	Values	Units
Value	String	30	Write Community validation string (SET data) (Null to query in text: Default = "private")	

SPEEDDIAL – Speed Dial a Number (840T & TH20 only)

This command dials a speed dial number.

Command Form: DEVICE **SPEEDDIAL** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	1 – 20 (Null to query in text)	

STRING – String Execution

This command sends the specified string out the serial port.

Command Form: **DEVICE STRING** [ID]

Argument	Type	Size	Values	Units
ID	Unsigned Integer	4	0 – 7 (Null to query last string in text)	

SYSCHECKS – System Checks

Initiates the system checks. **There is no query for this command.**

The **System Check** integer bits determine which tests are run. Each bit set generates a separate SYSRESULT response.

COMMAND FORM: **DEVICE SYSCHECKS** <System Check>

Argument	Type	Size	Values
System Check	Hexadecimal Integer	4	15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00 All other bits reserved

SYSRESULT – System Check Result

This command reports the results of the system check. **This command is reportable only. It cannot be queried or set.** The **System Check** integer bits determine which test result will be reported. Each test results in a separate SYSRESULT message.

Argument	Type	Size	Values
System Check	Hexadecimal Integer	4	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00</div> </div> <p style="margin-left: 40px;">All other bits reserved</p>
Status	Unsigned Integer	2	0 = Fail 1 = Pass 2 = NULL <Not Tested or Test Disabled in SYSCONFIG>
Message	String	40	<p>For the telephone on hook: the message will report the line voltage, the line current, other results, and if dial tone is detected.</p> <p>For the telephone off hook: the message will report the line current, other results, and if dial tone is detected.</p> <p>The bit mask for the other results is</p> <pre> x x x x x x x x --> set if switched from CTR21 to FCC because of low current --> set if used DIAL bit while dialing --> set if switch from Low Voltage to Japan because of current --> set if switch from Low Voltage to FCC because of current --> DAA OVL status --> DAA DOD status --> DAA OPD status --> Not used </pre> <p>For the network check: the box will report if no IP address is set. If it is set, the box will ping the gateway. The message will say the ping failed if it is not returned in 5 s. Otherwise, the message will report how many seconds it took to return the ping.</p>

TAMODE – Telco Adapt Mode

This command selects/reports the Telco adapt mode.

Command Form: **DEVICE TAMODE** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Auto 1 = Burst (Null to query in text)	

TE – Telco Enable (840T & TH20 only)

This command selects/reports the hook status.

Command Form: DEVICE **TE** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (R)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

TELCOLVLCtrl – Telco RX Level Control Enable / Disable (840T & TH20 only)

This command selects/reports the setting of Telco Rx level control.

Command Form: DEVICE **TELCOLVLCtrl** <Channel> [Value]

Argument	Type	Size	Values	Units
Channel	Channel	1	See Groups and Channels	
Group	Group	1	17 (T)	
Value	Unsigned Integer	2	0 = Off 1 = On 2 = Toggle (Null to query in text)	

TIMELocale – Time Locale Settings

This command sets or reports the time locale settings.

Command Form: DEVICE **TIMELocale** [DaylightSavings TimeZone TimeZoneName]

Argument	Type	Size	Values	Units
Daylight Savings	Unsigned Integer	4	0 = Do not use Daylight Savings 1 = Use Daylight Savings (NULL to Query in Text)	
Time Zone	Unsigned Integer	4	The number of seconds from UDT. (-86400 – 86400)	
Time Zone Argument	String	32	Description of time zone	

TOU – Time Out Select

This command selects/reports the inactivity time out before returning to the unit title screen on the front panel.

Command Form: DEVICE **TOU** [Value]

Argument	Type	Size	Values	Units
Value	Unsigned Integer	4	0 = No Time Out 1 – 15 (Null to query in text)	Min

UCLOCK – Clock Set by UDT Coordinates

This command sets or reports the current time.

Command Form: DEVICE **UCLOCK** [UDT time]

Argument	Type	Size	Values	Units
UDT time	Unsigned Integer	4		

UID – Unit ID

This command reports the unit id. **This command is read only.**

Command Form: `DEVICE UID` [Value]

Argument	Type	Size	Values	Units
Value	Hexadecimal	4	(Sent with a Null, value returned in text)	

VER - Version

This command reports the version of the unit. **This command is read only.**

Command Form: `DEVICE VER` [Value]

Argument	Type	Size	Values	Units
Value	String	8	Version of format MM.mm.rr (Sent with a Null in text, value returned)	

WAITSTATE – Wait State

This command defines a delay within macros and presets in ½ second increments from ½ second to 5 seconds. **This command can only be included in a macro. It will be ignored from other sources.**

Command Form: `DEVICE WAITSTATE` <Value>

Argument	Type	Size	Values	Units
Value	Unsigned Float	1	0.50 – 5.00	S

Serial Command Support Table

The following table shows serial command support by Converge Pro device type.

Command Name	Converge Pro 880	Converge Pro 840T	Converge Pro TH20	Converge Pro 8i
AA		X	X	
AAMB	X	X		X
AARINGS		X	X	
ACONN		X	X	
ACONNLVL		X	X	
AD		X	X	
ADCLIP	X	X	X	X
ADPRESENT	X	X	X	X
AEC	X	X		X
AGC	X	X	X	X
AGCSET	X	X	X	X
AMBLVL	X	X		X
AMXDUET	X	X	X	X
AUDIOMASTER	X	X	X	X
BAUD	X	X	X	X
CALLDUR		X	X	
CALLERID		X	X	
CGROUP	X	X		X
CHAIRO	X	X		X
CLEAREFFECT		X	X	
CLOCK	X	X	X	X
COMPRESS	X	X		X
COMPSEL	X	X		X
COUNTRY	X	X	X	X
CTRLMASTER	X	X	X	X
DECAY	X	X		X
DEFAULT	X	X	X	X
DELAY	X	X		X
DELAYSEL	X	X		X
DEVICENAME	X	X	X	X
DEVICESUBTYPE	X	X	X	X
DEVICETYPE	X	X	X	X
DFLTM	X	X	X	X
DIAL		X	X	
DID	X	X	X	X
DSPVER	X	X	X	X
DTMFLVL		X	X	
DTONELVL		X	X	
DUPDATE	X	X	X	X
DVER	X	X	X	X

Command Name	Converge Pro 880	Converge Pro 840T	Converge Pro TH20	Converge Pro 8i
ENETADDR	X	X	X	X
ENETDHCP	X	X	X	X
ENETDNS	X	X	X	X
ENETDNSA	X	X	X	X
ENETDNSA2	X	X	X	X
ENETDOMAIN	X	X	X	X
ENETGATE	X	X	X	X
ENETSUBN	X	X	X	X
EREF	X	X	X	
FILTER	X	X		X
FILTSEL	X	X		X
FLOW	X	X	X	X
FMP	X	X		X
FPGAVER	X	X	X	X
GAIN	X	X	X	X
GATE	X	X		X
GHOLD	X	X		X
GMODE	X	X		X
GOVER	X	X		X
GPIOSTATUS	X	X	X	X
GRATIO	X	X		X
GREPORT	X	X	X	X
GRPSEL	X	X		X
HOOK		X	X	
HOOKD		X	X	
LABEL	X	X	X	X
LCDCONTRAST	X	X	X	X
LMO	X	X		X
LOCALNUM		X	X	
LOCBLDG	X	X	X	X
LOCCITY	X	X	X	X
LOCCNTRY	X	X	X	X
LOCCOMP	X	X	X	X
LOCREGION	X	X	X	X
LOCROOM	X	X	X	X
LOCSITENAME	X	X	X	X
LOCSTATE	X	X	X	X
LOGMASK	X	X	X	X
LVL	X	X	X	X
LVLREPORT	X	X	X	X
LVLREPORTEN	X	X	X	X
MACRO	X	X	X	X
MANUFACTURER	X	X	X	X

Command Name	Converge Pro 880	Converge Pro 840T	Converge Pro TH20	Converge Pro 81
MAX	X	X	X	X
MIN	X	X	X	X
MINMAX	X	X	X	X
MLINE	X	X		X
MMAX	X	X		X
MTRX	X	X	X	X
MTRX2	X	X	X	X
MTRXCLEAR	X	X	X	X
MTRXLVL	X	X	X	X
MUTE	X	X	X	X
NAME	X	X	X	X
NCD	X	X	X	X
NCSEL	X	X	X	X
NLP	X	X		X
NOM	X	X	X	
NTPSRV	X	X	X	X
NULL		X	X	
OFFA	X	X		X
PAA	X	X		X
PBDIAL		X	X	
PHONEBOOKADD		X	X	
PHONEBOOKCNT		X	X	
PHONEBOOKDEL		X	X	
PHONEBOOKREAD		X	X	
PP	X	X		X
PRESET	X	X	X	X
PRGSTRING	X	X	X	X
PTTHRESHOLD	X	X		X
PUSHTOTALK	X	X		X
RAMP	X	X	X	X
REDIAL		X	X	
REFSEL	X	X		X
REFSET	X	X		
RESET	X	X	X	X
RING		X	X	
RINGEREN		X	X	
RINGERLVL		X	X	
RINGERSEL		X	X	
RINGERTST		X	X	
RXBOOST		X	X	
RXBSTEN		X	X	
SERECHO	X	X	X	X
SFTYMUTE	X	X	X	X

Command Name	Converge Pro 880	Converge Pro 840T	Converge Pro TH20	Converge Pro 8i
SIGGEN	X	X	X	X
SIGGENEN	X	X	X	X
SIGGENSWEEP	X	X	X	X
SIGTOUT	X	X	X	X
SLVL	X	X		X
SMTPSRV	X	X	X	X
SNMPMNGRIP	X	X	X	X
SNMPMNGRPORT	X	X	X	X
SNMPREADCOMM	X	X	X	X
SNMPWRITECOMM	X	X	X	X
SPEEDDIAL		X	X	
STRING	X	X	X	X
SYSCHECKS	X	X	X	X
SYSRESULT	X	X	X	X
TAMODE		X	X	
TE		X	X	
TELCOLVCTRL		X	X	
TIMELOCALE	X	X	X	X
TOUT	X	X	X	X
UCLOCK	X	X	X	X
UID	X	X	X	X
VER	X	X	X	X
WAITSTATE	X	X	X	X

APPENDIX B: DEFAULT PINOUTS

CONTROL/STATUS PORT A & B DEFAULT PINOUTS

Converge Pro 880: Port A

Pin #	User Definable	Control/Status	Default Description
1	Y	Control (Input)	
2	Y	Status (Output)	
3	Y	Control (Input)	Mute All Mics Toggle
4	Y	Status (Output)	Status of Mute All Mics
5	Y	Control (Input)	Mute Output 9 Toggle
6	Y	Status (Output)	Status of Mute Output 9
7	Y	Control (Input)	Mute Output 10 Toggle
8	Y	Status (Output)	Status of Mute Output 10
9	Y	Control (Input)	Mute Output 11 Toggle
10	Y	Status (Output)	Status of Mute Output 11
11	Y	Control (Input)	Mute Output 12 Toggle
12	Y	Status (Output)	Status of Mute Output 12
13	Y	Control (Input)	Volume Up Output 1 (1 dB)
14	Y	Status (Output)	
15	Y	Control (Input)	Volume Down Output 1 (1 dB)
16	Y	Status (Output)	
17	N	Status (Output)	Microphone 1 Gate Status
18	N	Status (Output)	Microphone 2 Gate Status
19	N	Status (Output)	Microphone 3 Gate Status
20	N	Status (Output)	Microphone 4 Gate Status
21	N	Status (Output)	Microphone 5 Gate Status
22	N	Status (Output)	Microphone 6 Gate Status
23	N	Status (Output)	Microphone 7 Gate Status
24	N	Status (Output)	Microphone 8 Gate Status
25	NA	NA	Ground

Converge Pro 840T: Port A

Pin #	User Definable	Control/Status	Default Description
1	Y	Control (Input)	
2	Y	Status (Output)	
3	Y	Control (Input)	Mute All Mics Toggle
4	Y	Status (Output)	Status of Mute All Mics
5	Y	Control (Input)	Telco On/Off Toggle
6	Y	Status (Output)	Status of Telco On/Off
7	Y	Control (Input)	Auto Answer Toggle

Pin #	User Definable	Control/Status	Default Description
8	Y	Status (Output)	Status of Auto Answer
9	Y	Control (Input)	Mute Output 5 Toggle
10	Y	Status (Output)	Status of Mute Output 5
11	Y	Control (Input)	Mute Input 5 Toggle
12	Y	Status (Output)	Status of Mute Input 5
13	Y	Control (Input)	Volume Up Output 8 (1 dB)
14	Y	Status (Output)	
15	Y	Control (Input)	Volume Down Output 8 (1 dB)
16	Y	Status (Output)	
17	N	Status (Output)	Microphone 1 Gate Status
18	N	Status (Output)	Microphone 2 Gate Status
19	N	Status (Output)	Microphone 3 Gate Status
20	N	Status (Output)	Microphone 4 Gate Status
21	Y	Status (Output)	
22	Y	Status (Output)	
23	Y	Status (Output)	
24	Y	Status (Output)	Ring Indication
25	NA	NA	Ground

Converge Pro TH20: Port A

Pin #	User Definable	Control/Status	Default Description
1	Y	Control (Input)	Telco On
2	Y	Status (Output)	Telco On Indicator
3	Y	Control (Input)	Telco Off
4	Y	Status (Output)	Telco off indicator
5	Y	Control (Input)	
6	Y	Status (Output)	
7	Y	Control (Input)	
8	Y	Status (Output)	
9	Y	Control (Input)	Transmit Mute
10	Y	Status (Output)	Transmit Mute status
11	Y	Control (Input)	Receive Mute
12	Y	Status (Output)	Receive mute status
13	Y	Control (Input)	
14	Y	Status (Output)	
15	Y	Control (Input)	
16	Y	Status (Output)	
17	Y	Status (Output)	
18	Y	Status (Output)	
19	Y	Status (Output)	
20	Y	Status (Output)	
21	Y	Status (Output)	
22	Y	Status (Output)	

Pin #	User Definable	Control/Status	Default Description
23	Y	Status (Output)	
24	Y	Status (Output)	Ring Indication
25	NA	NA	Ground

Converge Pro 8i: Port A

Pin #	User Definable	Control/Status	Default Description
1	Y	Control (Input)	
2	Y	Status (Output)	
3	Y	Control (Input)	Mute All Mics Toggle
4	Y	Status (Output)	Status of Mute All Mics
5	Y	Control (Input)	Mute Mic 1 Toggle
6	Y	Status (Output)	Status of Mute Mic 1
7	Y	Control (Input)	Mute Mic 2 Toggle
8	Y	Status (Output)	Status of Mute Mic 2
9	Y	Control (Input)	Mute Mic 3 Toggle
10	Y	Status (Output)	Status of Mute Mic 3
11	Y	Control (Input)	Mute Mic 4 Toggle
12	Y	Status (Output)	Status of Mute Mic 4
13	Y	Control (Input)	Mute Mic 5 Toggle
14	Y	Status (Output)	Status of Mute Mic 5
15	Y	Control (Input)	Mute Mic 6 Toggle
16	Y	Status (Output)	Status of Mute Mic 6
17	N	Status (Output)	Microphone 1 Gate Status
18	N	Status (Output)	Microphone 2 Gate Status
19	N	Status (Output)	Microphone 3 Gate Status
20	N	Status (Output)	Microphone 4 Gate Status
21	N	Status (Output)	Microphone 5 Gate Status
22	N	Status (Output)	Microphone 6 Gate Status
23	N	Status (Output)	Microphone 7 Gate Status
24	N	Status (Output)	Microphone 8 Gate Status
25	NA	NA	Ground

Converge Pro 880, 840T, 8i, TH20: Port B

Pin #	User Definable	Control/Status	Default Description
1	N	Control (Input)	Preset Mask Bit 0
2	N	Status (Output)	Preset Indicator Bit 0
3	N	Control (Input)	Preset Mask Bit 1
4	N	Status (Output)	Preset Indicator Bit 1
5	N	Control (Input)	Preset Mask Bit 2
6	N	Status (Output)	Preset Indicator Bit 2
7	N	Control (Input)	Preset Mask Bit 3
8	N	Status (Output)	Preset Indicator Bit 3
9	N	Control (Input)	Preset Mask Bit 4

Pin #	User Definable	Control/Status	Default Description
10	N	Status (Output)	Preset Indicator Bit 4
11	N	Control (Input)	Preset Mask Bit 5
12	N	Status (Output)	Preset Indicator Bit 5
13	N	Control (Input)	Preset Mask Bit 6
14	N	Status (Output)	Preset Indicator Bit 6
15	N	Control (Input)	Preset Mask Bit 7
16	N	Status (Output)	Preset Indicator Bit 7
17	N	Control (Input)	Preset Mask Bit 8
18	N	Status (Output)	Preset Indicator Bit 8
19	N	Control (Input)	Preset Mask Bit 9
20	N	Status (Output)	Preset Indicator Bit 9
21	Y	Control (Input)	
22	Y	Status (Output)	
23	NA	NA	+3.3V 300 mA
24	NA	NA	+3.3V 300 mA
25	NA	NA	Ground

APPENDIX C: SPECIFICATIONS

Converge Pro 880

Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with a 20 Hz to 22 kHz BW limit (no weighting)
- Frequency Response: 20 Hz to 22 kHz ± 1 dB
- Noise (EIN): -126 dBu, 22 kHz BW, max gain,
- $R_s = 150 \Omega$
- THD+N: <0.02%
- Dynamic Range: 100 dB (non A-weighted)
- Crosstalk < -91 dB re 20 dBu @ 20 kHz channel to channel

Auto Mixer Parameters

- Number of Open Microphones (NOM)
- PA Adaptive Mode
- First Mic Priority Mode
- Last Mic Mode
- Maximum # of Mics Mode
- Ambient Level
- Gate Threshold Adjust
- Off Attenuation Adjust
- Hold Time
- Decay Rate

Matrix Mixing Parameters

- 36x36 matrix
- 12 analog in/out
- 12 expansion bus in/out
- 8 assignable processing blocks in/out
- 4 assignable fader blocks in/out

Assignable Processing Blocks

- Filters
 - » All pass
 - » Low pass
 - » High pass
 - » Low shelving
 - » High shelving
 - » Parametric EQ
 - » Notch
 - » CD Horn
- Crossovers
 - » Bessel
 - » Butterworth
 - » Linkwitz-Riley
- Compressor
- Delay; adjustable up to 250 ms

Assignable Fader Blocks

- Gain/Mute

Microphone Input Configuration

- Input Gain Adjust
- Mic or Line Level
- Phantom Power on/off
- Echo Cancellation on/off
- Noise Cancellation on/off
- Filters
 - » All Pass

- » Low Pass
- » High Pass
- » Notch
- » PEQ

- Mute on/off
- Chairman Override on/off
- AGC on/off
- Automatic Level Control on/off
- Auto Gate/Manual gate
- Adaptive Ambient on/off
- Pre AEC channel

Mic/Line Inputs 1-8

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: adjustable -56 dBu to 0 dBu (7 dB step coarse gain adjustment)
- Maximum Level: -65 dBu to +20 dBu
- Echo Cancellation: 130 ms tail time (works with 12 dB of room gain)
- Noise Cancellation: 6–15 dB attenuation
- Phantom Power: 24 V, selectable

Line Inputs 9-12

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Outputs 1-12

- Push-on mini-terminal block, balanced
- Impedance: < 50 Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Expansion Bus In/Out

- Proprietary Network
- RJ-45 (2), 1.9 Mbps
- Category 5 twisted-pair cable, 200' maximum cable length between any two Converge Pro devices

Ethernet

- Autoswitching with Quality of Connection (QoC)
- 10/100 Mbps Ethernet Network Port
- 10/100 Mbps Ethernet PC Port
- RJ-45 Connectors

RS-232

- Serial Command Protocol Only (Console software not supported on RS- 232 port)
- DB-9 female
- 9,600/19,200/38,400/57,600/115,200 baud rate; 8 bits, 1 stop bit, no parity
- Hardware flow control on (default)/off

USB

- Version 2.0 compatible
- Type: B-connector

Converge Pro 880 (continued)

Control/Status Ports

- DB-25 female A/B (2)
- Inputs A/B: active low (pull to ground)
- Outputs A/B: open collector, 40 VDC max, 40 mA each
- +3.3 VDC pins (2) (300 mA over-current protected)

Configuration & Administration Software

- Converge™ Console

Power Input Range

- Auto-Adjusting
- 100–240 VAC; 50/60 Hz

Power Consumption

- 30 W Typical

Dimensions (L x D x H)

- 17.25" x 10.25" x 1.75"
- 43.8 x 26 x 4.5 cm

Weight

- 7.5 lbs/3.3375 kg unit weight
- 12 lbs/5.4kg shipping weight

Operating Temperature

- 14° F/-10° C to 122° F/50° C ambient unit temperature

Approvals

- See *Appendix D: Compliance*
- AES48-2005: AES standard on interconnections — Grounding and EMC practices — Shields of connectors in audio equipment containing active circuitry (self certified)

Optional Accessories

- Converge Pro 840T
- Converge Pro 8i
- Converge Pro TH20
- Tabletop Controller
- Button Microphone - Omnidirectional
- Button Microphone – Unidirectional
- Delta Microphone
- Tabletop Microphone – Unidirectional
- JBL Wall-Mount Speakers

Part Number

910-151-880 Converge Pro 880
8-Channel AEC Microphone Mixer

Converge Pro 840T

Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with a 20 Hz to 22 kHz BW limit (no weighting)
- Frequency Response: 20 Hz to 22 kHz ± 1 dB
- Noise (EIN): -126 dBu, 20 kHz BW, max gain,
- $R_s = 150 \Omega$
- THD+N: <0.02%
- Dynamic Range: 100 dB (non A-weighted)
- Crosstalk <-91 dB re 20 dBu @ 20 kHz channel to channel

Auto Mixer Parameters

- Number of Open Microphones (NOM)
- PA Adaptive Mode
- First Mic Priority Mode
- Last Mic Mode
- Maximum # of Mics Mode
- Ambient Level
- Gate Threshold Adjust
- Off Attenuation Adjust
- Hold Time
- Decay Rate

Matrix Mixing Parameters

- 29x30 matrix
- 8 analog in/out
- 1 speaker out (amplified)
- 12 expansion bus in/out
- 4 assignable processing blocks in/out
- 4 assignable fader blocks in/out
- 1 telco in/out

Assignable Processing Blocks

- Filters
 - » All pass
 - » Low pass
 - » High pass
 - » Low shelving
 - » High shelving
 - » Parametric EQ
 - » Notch
 - » CD Horn
- Crossovers
 - » Bessel
 - » Butterworth
 - » Linkwitz-Riley
- Compressor
- Delay; adjustable up to 250 ms

Assignable Fader Blocks

- Gain/Mute

Microphone Input Configuration

- Input Gain Adjust
- Mic or Line Level
- Phantom Power on/off
- Echo Cancellation on/off
- Noise Cancellation on/off
- Filters
 - » All Pass
 - » Low Pass
 - » High Pass
 - » Notch
 - » PEQ
- Mute on/off
- Chairman Override on/off

- AGC on/off
- Automatic Level Control on/off
- Auto Gate/Manual gate
- Adaptive Ambient on/off
- Pre AEC channel

Mic/Line Inputs 1-4

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: adjustable -56 dBu to 0 dBu (7 dB step coarse gain adjustment)
- Maximum Level: -65 dBu to +20 dBu
- Echo Cancellation: 130 ms tail time (works with 12 dB of room gain)
- Noise Cancellation: 6–15 dB attenuation
- Phantom Power: 24 V, selectable

Line Inputs 5-8

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Outputs 1-8

- Push-on mini-terminal block, balanced
- Impedance: < 50 Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Amplifier Output

- Binding Post Connection
- 10 Watts @ 4 Ω Impedance
- THD + Noise: < 0.5%

Telco Line

- RJ-11
- POTS (plain old telephone service) or analog extension from a PBX
- A-lead supervision provided

Telco Set

- RJ-11
- POTS (plain old telephone service) or analog extension from a PBX
- A-lead supervision provided

Telephone Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with Transmit Limiter and Receive ALC disabled
- Frequency Response: 250Hz to 3.3 kHz ± 1 dB
- THD+N: <0.3% re-max level 250 Hz to 3.3 kHz
- SNR: > 62 dB re-max level

Telco Line Echo Cancellation

- Tail Time: 31 ms
- Null: 55 dB nominal

Telephone Noise Cancellation

- Noise Cancellation 6-15 dB attenuation

Expansion Bus In/Out

- Proprietary Network
- RJ-45 (2), 1.9 Mbps
- Category 5 twisted-pair cable, 200' maximum cable length between any two Converge Pro devices

Converge Pro 840T (continued)

Ethernet

- Autoswitching with Quality of Connection (QoC)
- 10/100 Mbps Ethernet Network Port
- 10/100 Mbps Ethernet PC Port
- RJ-45 Connectors

RS-232

- Serial Command Protocol Only (Console software not supported on RS- 232 port)
- DB-9 female
- 9,600/19,200/38,400/57,600/115,200 baud rate; 8 bits, 1 stop bit, no parity
- Hardware flow control on (default)/off

USB

- Version 2.0 compatible
- Type: B-connector

Control/Status Ports

- DB-25 female A/B (2)
- Inputs A/B: active low (pull to ground)
- Outputs A/B: open collector, 40 VDC max, 40 mA each
- +3.3 VDC pins (2) (300 mA over-current protected)

Configuration & Administration Software

- Converge™ Console

Power Input Range

- Auto-Adjusting
- 100–240 VAC; 50/60 Hz

Power Consumption

- 30 W Typical

Dimensions (L x D x H)

- 17.25" x 10.25" x 1.75"
- 43.8 x 26 x 4.5 cm

Weight

- 7.5 lbs/3.3375 kg unit weight
- 12 lbs/5.4kg shipping weight

Operating Temperature

- 14° F/-10° C to 122° F/50° C ambient unit temperature

Approvals

- See *Appendix D: Compliance*
- AES48-2005: AES standard on interconnections — Grounding and EMC practices — Shields of connectors in audio equipment containing active circuitry (self certified)

Optional Accessories

- Converge Pro 880
- Converge Pro 8i
- Converge Pro TH20
- Tabletop Controller
- Button Microphone - Omnidirectional
- Button Microphone – Unidirectional
- Delta Microphone
- Tabletop Microphone – Unidirectional
- JBL Wall-Mount Speakers

Part Number

910-151-840 Converge Pro 840T
4-Channel AEC Microphone Mixer with Telephone Hybrid
Amplifier

Converge Pro 8i

Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with a 20 Hz to 22 kHz BW limit (no weighting)
- Frequency Response: 20 Hz to 22 kHz ± 1 dB
- Noise (EIN): -126 dBu, 20 kHz BW, max gain,
- $R_s = 150 \Omega$
- THD+N: <0.02%
- Dynamic Range: 100 dB (non A-weighted)
- Crosstalk < -91 dB re 20 dBu @ 20 kHz channel to channel

Auto Mixer Parameters

- Number of Open Microphones (NOM)
- PA Adaptive Mode
- First Mic Priority Mode
- Last Mic Mode
- Maximum # of Mics Mode
- Ambient Level
- Gate Threshold Adjust
- Off Attenuation Adjust
- Hold Time
- Decay Rate

Matrix Mixing Parameters

- 36x24 matrix
- 12 analog in/out
- 12 expansion bus in/out
- 8 assignable processing blocks in/out
- 4 assignable fader blocks in/out

Assignable Processing Blocks

- Filters
 - » All pass
 - » Low pass
 - » High pass
 - » Low shelving
 - » High shelving
 - » Parametric EQ
 - » Notch
 - » CD Horn
- Crossovers
 - » Bessel
 - » Butterworth
 - » Linkwitz-Riley
- Compressor
- Delay; adjustable up to 250 ms

Assignable Fader Blocks

- Gain/Mute

Microphone Input Configuration

- Input Gain Adjust
- Mic or Line Level
- Phantom Power on/off
- Echo Cancellation on/off
- Noise Cancellation on/off
- Filters
 - » All Pass
 - » Low Pass
 - » High Pass
 - » Notch
 - » PEQ
- Mute on/off
- Chairman Override on/off
- AGC on/off
- Automatic Level Control on/off

- Auto Gate/Manual gate
- Adaptive Ambient on/off
- Pre AEC channel

Mic/Line Inputs 1-8

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: adjustable -56 dBu to 0 dBu (7 dB step coarse gain adjustment)
- Maximum Level: -65 dBu to +20 dBu
- Echo Cancellation: 130 ms tail time (works with 12 dB of room gain)
- Noise Cancellation: 6–15 dB attenuation
- Phantom Power: 24 V, selectable

Line Inputs 9-12

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 K Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Expansion Bus In/Out

- Proprietary Network
- RJ-45 (2), 1.9 Mbps
- Category 5 twisted-pair cable, 200' maximum cable length between any two Converge Pro devices

Ethernet

- Autoswitching with Quality of Connection (QoC)
- 10/100 Mbps Ethernet Network Port
- 10/100 Mbps Ethernet PC Port
- RJ-45 Connectors

RS-232

- Serial Command Protocol Only (Console software not supported on RS-232 port)
- DB-9 female
- 9,600/19,200/38,400/57,600/115,200 baud rate; 8 bits, 1 stop bit, no parity
- Hardware flow control on (default)/off

USB

- Version 2.0 compatible
- Type B connector

Control/Status Ports

- DB-25 female A/B (2)
- Inputs A/B: active low (pull to ground)
- Outputs A/B: open collector, 40 VDC max, 40 mA each
- +3.3 VDC pins (2) (300 mA over-current protected)

Configuration & Administration Software

- Converge™ Console

Power Input Range

- Auto-Adjusting
- 100–240 VAC; 50/60 Hz

Power Consumption

- 30 W Typical

Dimensions (L x D x H)

- 17.25" x 10.25" x 1.75"
- 43.8 x 26 x 4.5 cm

Weight

- 7.5 lbs/3.3375 kg unit weight
- 12 lbs/5.4 kg shipping weight

Converge Pro 8i (continued)

Operating Temperature

- 14° F/-10° C to 122° F/50° C ambient unit temperature

Approvals

- See *Appendix D: Compliance*
- AES48-2005: AES standard on interconnections — Grounding and EMC practices — Shields of connectors in audio equipment containing active circuitry (self certified)

Optional Accessories

- Converge Pro 880
- Converge Pro 840T
- Converge Pro TH20
- Tabletop Controller
- Button Microphone - Omnidirectional
- Button Microphone – Unidirectional
- Delta Microphone
- Tabletop Microphone – Unidirectional
- JBL Wall-Mount Speakers

Part Number

910-151-810 Converge Pro 8i
8-Channel AEC Microphone Mixer (no outputs)

Converge Pro TH20

Telephone Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with Transmit Limiter and Receive ALC disabled
- Frequency Response: 250Hz to 3.3 kHz \pm 1dB
- THD+N: <0.3% re-max level 250 Hz to 3.3 kHz
- SNR: > 62 dB re-max level

Telephone Noise Cancellation

- Noise Cancellation 6-15 dB attenuation

Telco Line Echo Cancellation

- Tail Time: 31 ms
- Null: 55 dB nominal

Telco Line

- RJ-11
- POTS (plain old telephone service) or analog extension from a PBX
- A-lead supervision provided

Telco Set

- RJ-11
- POTS (plain old telephone service) or analog extension from a PBX
- A-lead supervision provided

Audio Performance

- Conditions: Unless otherwise specified, all measurements are performed with a 20 Hz to 22 kHz BW limit (no weighting)
- Frequency Response: 20 Hz to 22 kHz \pm 1dB
- $R_s=150\ \Omega$
- THD+N: <0.02%
- Dynamic Range: 100 dB (non A-weighted)
- Crosstalk <-91 dB re 20 dBu @ 20 kHz channel to channel

Line Inputs 1, 2

- Push-on mini-terminal block, balanced, bridging
- Impedance: < 5 k Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Line Outputs 1,2

- Push-on mini-terminal block, balanced
- Impedance: < 50 k Ω
- Nominal Level: 0 dBu
- Maximum Level: 20 dBu

Expansion Bus In/Out

- Proprietary Network
- RJ-45 (2), 1.9 Mbps, 110 K Ω Impedance
- Category 5 twisted-pair cable, 200' maximum cable length between any two Converge Pro devices

Ethernet

- Autoswitching with Quality of Connection (QoC)
- 10/100 Mbps Ethernet Network Port
- 10/100 Mbps Ethernet PC Port
- RJ-45 Connectors

RS-232

- Serial Command Protocol Only (Console software not supported on RS-232 port)
- DB-9 female

- 9,600/19,200/38,400/57,600/115,200 baud rate; 8 bits, 1 stop bit, no parity
- Hardware flow control on (default)/off

USB

- Version 2.0 compatible
- Type: B-connector

Control/Status Ports

- DB-25 female A/B (2)
- Inputs A/B: active low (pull to ground)
- Outputs A/B: open collector, 40 VDC max, 40 mA each
- +3.3 VDC pins (2) (300 mA over-current protected)

Configuration & Administration Software

- Converge™ Console

Power Input Range

- Auto-Adjusting
- 100–240 VAC; 50/60 Hz

Power Consumption

- 30 W Typical

Dimensions (L x D x H)

- 17.25" x 10.25" x 1.75"
- 43.8 x 26 x 4.5 cm

Weight

- 7.5 lbs/3.3375 kg unit weight
- 12 lbs/5.4kg shipping

Operating Temperature

- 14° F/-10° C to 122° F/50° C ambient unit temperature

Approvals

- See *Appendix D: Compliance*
- AES48-2005: AES standard on interconnections — Grounding and EMC practices — Shields of connectors in audio equipment containing active circuitry (self certified)

Optional Accessories

- Converge Pro 880
- Converge Pro 8i
- Converge Pro TH20
- Tabletop Controller
- Button Microphone - Omnidirectional
- Button Microphone – Unidirectional
- Delta Microphone
- Tabletop Microphone – Unidirectional
- JBL Wall-Mount Speakers

Part Number

910-151-820 Converge Pro TH20
Telephone Interface for Converge Pro 880, 840T, 8i

APPENDIX D: COMPLIANCE



WARNING: The country code must be set correctly in Console to ensure that the unit operates properly when connected to the telco network, and that it complies with the country's telco requirements. Changing this code to a country other than the intended country of operation might cause Converge Pro devices to be non-compliant.

FCC PART 15/ICES-003 COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules and Industry Canada ICES-003. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by ClearOne Communications could void the user's authority to operate the equipment.

FCC PART 68 COMPLIANCE

US:FBIBR00BCONVPRO
Ringer Equivalence Number (REN): 0.0B(ac)

This equipment complies with Part 68 of the FCC Rules Requirements adopted by ACTA. On the mixer unit of this equipment contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this information must be provided to your telephone company.

The REN is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to obtain the maximum RENs for the calling area. The REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g. 03 is a REN of 0.3).

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications to maintain uninterrupted service.

This equipment uses an RJ11C jack that is used to connect this equipment to the premises wiring and telephone network. This RJ11C jack complies with the applicable FCC Part 68 Rules and Requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

If you experience problems with this equipment, contact ClearOne Communications, 5225 Wiley Post Way, Suite 500, Salt Lake City, Utah 84116, or by phone at (800) 945-7730 for repair and warranty information. If the equipment is causing harm to the telephone network, the telephone company may request you disconnect the equipment until the problem is resolved.

No user serviceable parts are contained in this product. If damage or malfunction occurs, contact ClearOne Communications for instructions on its repair or return.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information. This equipment cannot be used on telephone company provided coin service.

If your home has specially wired alarm equipment connected to the telephone line, ensure the installation of this equipment does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

ELECTRICAL SAFETY ADVISORY

This equipment uses AC power which can be subjected to electrical surges, typically lightning transients which are very destructive to customer terminal equipment connected to AC power sources. The warranty for this equipment does not cover damage caused by electrical surge or lightning transients. To reduce the risk of this equipment becoming damaged it is suggested that the customer consider installing a surge arrester.

IC COMPLIANCE

IC: 1970A-CONVPRO
Ringer Equivalence Number (REN): 0.0B(ac)

NOTICE: The term "IC" before the certification/registration number signifies that Industry of Canada technical specifications were met.

This certification means that the equipment meets certain telecommunications network protective operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

The REN is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to obtain the maximum RENs for the calling area. The REN for this product is listed above.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the companies inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by ClearOne Communications. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

EUROPEAN COMPLIANCE

Conformity of the equipment with the guidelines below is attested by the CE mark.



EC Declaration of Conformity

Manufacturer's Name: ClearOne Communications
Manufacturer's Address: Edgewater Corporate Park South Tower
5225 Wiley Post Way, Suite 500
Salt Lake City, Utah 84116 U.S.A.
Model: Converge Pro (880, 8I, 840T & TH20).

Declares that the product(s) listed above conform(s) to the following Council Directive(s): 1999/5/EC Radio equipment and Telecommunications Terminal Equipment (R&TTE) Directive.

Product Standard(s) to which Conformity of the Council Directive(s) is declared:

EMC - 89/336/EEC “Electromagnetic Compatibility (EMC) Directive”:

EN 55022: 2006 (Emissions)	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.
EN 55024: 1998 (Immunity) +A1+A2	Information technology equipment - Immunity characteristics -Limits and methods of measurements.
EN 61000-3-2: 2004	Part 3: Limits - Section 2: Limits for harmonic current emissions.
EN 61000-3-3: 2002	Section 3: Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current up to and including 16 A.
EN 61000-4-2: 2001	Electrostatic Discharge Immunity
EN 61000-4-3: 2002	Radiated RF Immunity
EN 61000-4-4: 2004	Electrical Fast Transients Immunity
EN 61000-4-5: 2005	Lightning Surge Immunity
EN 61000-4-6: 2004	Conducted RF Immunity
EN 61000-4-8: 1993	Power Frequency Magnetic Field Immunity
EN 61000-4-11: 2004	Voltage Dips and Voltage Interruptions
EN55024: A1 + A2: 1998	Telecommunication Terminal Equipment

Safety - 73/23/EEC “Low Voltage Directive (LVD)”:

IEC 60950-1: 2001	Safety of Information Technology Equipment, Including Electrical Business Equipment.
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Telecom - Telecom Terminal Equipment (Converge Pro 840T & Converge Pro TH20 Only):

ETSI ES 203 021 - 1, 2 and 3

Access and Terminals (AT); Harmonized basic attachment requirements for Terminals for connection to analogue interfaces of the Telephone Networks; Update of the technical contents of TBR 021, EN 301 437, TBR 015, TBR 017; Part 1: General aspects, Part 2: Basic transmission and protection of the network from harm, Part 3: Basic Interworking with the Public Telephone Networks.

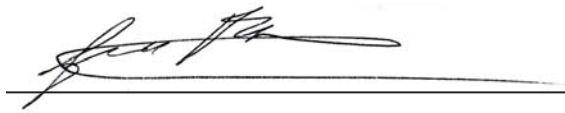
2003/11/EC & 2002/95/EC “RoHS Compliance Directive”:

We herein certify that the Converge Pro (880, 8I, 840T & TH20) including all supplied accessories and cables are in compliance with the EU directive 2003/11/EC and EU directive 2002/95/EC.

We, the undersigned, hereby declare that the equipment specified above conforms to the above directives and standards.

Manufacturer

Legal Representative in Europe



Signature

Signature

Tracy Bathurst
Full Name
VP of Product Line Management
Title

Martin Offwood
Full Name
Managing Director - EMEA North
Title

Waste Electrical and Electronic Equipment “WEEE Directive 2002/95/EC”:

ClearOne is compliant with the WEEE directive. For recovery and recycling information, visit:
www.clearone.com/support/recycling.php?content=main

GLOSSARY

Acoustic Echo Cancellation (AEC) A process in which acoustical echo is removed from a signal. AEC can be used to remove unwanted signals from mic audio if the unwanted acoustic signal is available separately as an electronic signal.

Adaptive Ambient This portion of the mixer monitors the varying ambient noise level in the room and changes the threshold level at which a microphone gates on.

Ambient Level A user-defined background noise level used to control microphone gating (used only if Adaptive Ambient is disabled).

Ambient Noise The existing room-level noise, such as that caused by ventilation systems, paper shuffling, and background chatter.

Attack Time Determines how quickly compression is enabled (calibrated in milliseconds). See also Compression, Compressor, and Threshold.

Attenuation A reduction of signal amplitude.

Audible Hook Indication A series of beeps that indicates when the telephone line goes on or off hook. This feature can be turned on or off, and the level can be adjusted in the Telco Rx Channel Configuration window.

Audible Ringer Indication When a call comes in, you can hear it ring if Audible Ringer Indication is turned on in the Telco Rx Channel Configuration window. The ringer level can also be adjusted.

Audio Routing The process of routing input signals to output channels in the Matrix based on default or user-defined cross points. See also Matrix.

Automatic Gain Control (AGC) Automatically increases or decreases audio gain to maintain a consistent audio level.

Automatic Gating Automatically gates microphones on or off based on gating parameters set in the Mic Input Channel Configuration window.

Automatic Level Control (ALC) ALC can be selected for telco receive and mic input channels. ALC keeps soft and loud telephone participants at a consistent level. ALC can be turned on or off in the Telco Rx and Mic Input Channel Configuration windows. The default is on for Telco Rx and on for mic inputs.

Bandwidth The difference between the lower and upper end points of an audio band. Also, the range or differences between the limiting frequencies of a continuous frequency band.

Baud Rate The number of signal transitions per second, or the clock rate of the serial bit stream in hertz. Given 7 or 8 bits for data plus start and stop, the approximate ASCII character transmission rate is one-tenth the baud rate.

CD Horn EQ (Constant Directivity Horn Equalizer) Horn drivers used in arenas and auditoriums have an inherent 6dB/octave high frequency rolloff. The CD Horn EQ compensates for this characteristic.

Chairman Override Provides gating priority for chairman override enabled microphones within the same gating group. When a mic with chairman override gates on, all mics that don't have chairman override enabled and are in the same gating group will gate off.

Clear Effect To reduce bandwidth requirements, telephone lines limit audio bandwidth to a range of 300Hz-3.3kHz. ClearEffect enhances the incoming signal from a telephone line to emulate wideband audio by adding high and low frequencies to the audio signal, creating a richer, fuller sound. All output signals routed from an input channel with ClearEffect enabled are routed as wideband audio.

Clipping Clipping occurs when a signal level exceeds the maximum level a circuit can handle. This is usually caused by improper gain settings. Clipping causes distortion, listener fatigue, and accelerated failure of speakers.

Compression An induced reduction in the dynamic range of all or part of an audio signal. Compression is usually used to protect individual loudspeaker components from damage caused by transient peaks in audio signals.

Compressor A signal processor used to perform compression and control the dynamic range of an audio signal.

Control Bus Part of the Expansion Bus, the Control Bus passes control information to the units. Control is not affected by audio master/slave settings and will continue to function even if the units are not using the audio channels. See also Expansion Bus.

Crossover A device that passes designated frequency ranges of an audio signal to specified loudspeaker elements in a sound system. Converge Pro provides the following types of crossovers:

- **Bessel** A crossover using a low-pass filter design characterized by a linear phase response. This results in a constant time delay throughout the passband.
- **Butterworth** A crossover using a low-pass filter design characterized by a maximally flat magnitude response. This results in no amplitude ripple in the passband.
- **Linkwitz-Riley** A fourth-order crossover consisting of a cascaded second order Butterworth low-pass filter. Offers a vast improvement over the Butterworth crossover and is the de facto standard for professional audio active crossovers.

Cross Point The intersection between an input and an output in the routing matrix. Cross point cells are color coded according to input type: yellow = gated; blue = non-gated; brown = pre-AEC; green = cross point. See also Gating, Pre-AEC Channel.

Cross Point Level Adjust The process of adjusting the audio level (gain/attenuation) at the cross point. Cross Point Levels are set using the Cross Point Attenuation Slider, which allows you attenuate the signal from 0 to -60dB (it also allows you to add gain to the signal, from 0 to 12dB).

Decay Rate Determines how fast a mic input channel gates off after the specified Hold time expires (slow, medium, fast). The default is medium.

Default Meter The input/output level meter displayed on the front panel LED meter. All Converge Pro meters are peak-level meters.

Delay Delay calculates the amount of signal delay based on the distance between audio source and audience, and the temperature. Introducing an appropriate amount of delay can maintain acoustical alignment and proper sound imaging in a room regardless of speaker location. This setting can also compensate for propagation delay caused by signal processing, such as analog to digital conversion. Delay is set in the Channel Property Configuration window for Processing channels. See also Processing Blocks.

Device ID A number which identifies the unit when multiple units of the same device type are connected via the Expansion Bus. All Converge Pro units ship from the factory with a default DID of 0.

Device Type A number which identifies the type of unit. Converge Pro Device Types and Device IDs by model are as follows:

Model	Device Type	Device ID Range
880	1	0-7
TH20	2	0-F
840T	3	0-7
8i	A	0-7

DHCP (Dynamic Host Configuration Protocol) Part of the IP protocol suite, DHCP enables a host server to dynamically assign IP addresses, subnet masks, default gateways, and other parameters to devices on IP-based networks. See also Default Gateway and Subnet Mask.

Dial Tone Level A setting in the Channel Property Configuration window for Telco Rx channels that allows you to adjust the dial tone level in 1dB steps to ± 12 dB.

DNS (Domain Name System) Part of the IP protocol suite, DNS manages the translation of plain-text internet domain names (URLs) into numeric IP addresses.

DTMF (Dual Tone Multi Frequency) Dialing DTMF or touch-tone dialing allows users to issue tones for access to voice mail, pagers, etc.

DTMF (Dual Tone Multi Frequency) Level A setting in the Channel Property Configuration window for Telco Rx channels used to adjust the level (volume) of the DTMF tones that are heard when dialing. Level can be adjusted in 1dB steps to ± 12 dB.

EC (Echo Canceller) Reference A signal that contains an electronic copy of all signals which will be removed from the signal the mics pick up. This is always the far-end audio and, optionally, local audio sources.

EC (Echo Canceller) Reference Summing The ability to combine multiple signals in a single echo cancellation reference signal. See also Virtual Reference.

ERL (Echo Return Loss) The ERL meter shows the coupling between the reference signal and the input to the echo canceller—the ratio of the two levels.

ERLE (Echo Return Loss Enhancement) The echo return loss enhancement (ERLE) meter shows the loss through the echo cancellation and NLP (non-linear processing) chain—the ratio of the two levels.

Expansion Bus Consists of two RJ-45 connectors (the Link In and Link Out ports) on the rear panel of all Converge Pro models. The Expansion Bus allows multiple Converge Pro devices to be linked together using CAT-5 twisted-pair cable.

Expansion Bus Reference The Expansion Bus Reference allows you to reference an output on another Converge Pro device in a site for Echo Cancellation and PA Adaption.

Filter A device that passes and blocks audio signals based on user-definable requirements of the system.

- **All Pass** A filter that provides only phase shift or phase delay without appreciably changing the magnitude characteristic. The filter produces a flat amplitude response. It is useful for matching the delay of two processing channels with different delays.
- **High Pass** A filter that passes high signal frequencies while attenuating low frequencies.
- **High Shelving** Provides boosting or attenuation of frequencies above a designated frequency. The transition between the spectrum above and below the designated frequency occurs at a fixed 6dB/octave rate. The gain or loss above the corner frequency is adjustable to ± 15 dB.
- **Low Pass** A filter that passes low frequencies while attenuating high frequencies.
- **Low Shelving** Provides boosting or attenuation of frequencies below a designated frequency. The transition between the spectrum above and below the designated frequency occurs at a fixed 6dB/octave rate. The gain or loss below the corner frequency is adjustable to ± 15 dB.

First Mic Priority Increases the audio level required to gate on additional microphones after the first mic is on. This helps ensure that only one mic gates on when a person speaks.

Gain The amount a signal is increased over a given reference, typically 0, normally specified in dB (decibels). On Converge Pro devices, gain is adjustable from -65 to 20dB (85dB range) in .5dB increments.

Gain Structure A set of configuration parameters that define the gain characteristics of a signal. The optimal input gain setting is one which provides both an adequate signal-to-noise ratio and reasonable headroom.

Gateway A device used to provide external network access to client devices on IP networks. All traffic with IP addresses outside the specified subnet mask are automatically routed to the gateway. See also DHCP and Subnet Mask.

Gating The activation and deactivation of mic inputs. Converge Pro provides three types of microphone gating:

- **Auto** The microphone will gate on according to the input level, assigned gating parameters, and gating group.
- **Manual On** The microphone will gate on unless it exceeds the NOM requirements of the gating group.
- **Manual Off** The microphone is deactivated.

Gate Ratio Specifies how much louder the microphone audio level must be over the ambient sound level before a microphone gates on.

Gating Controls The gating parameters that are assigned to a gating group, including:

- **Maximum Number of Mics** Sets the maximum number of mics that can be gated on simultaneously.
- **First Mic Priority** Increases the audio level required to gate on additional microphones after the first mic is gated on.
- **Last Mic Mode** Sets the last-activated mic to Last On, Mic 1-8, or Off.

Gating Groups A set of gating parameters which can be applied to microphones connected to the local device, or to microphones connected to other units on the Expansion Bus (Global Gating Groups A–D). Gating groups provide greater flexibility and control of mics. See also Global Gating Bus and Expansion Bus.

Global Gating Bus Part of the Expansion Bus, these four mix-minus buses (O-R) pass mic status and gate parameter information such as First Mic Priority and NOM (Number of Open Mics). See also First Mic Priority and NOM.

GPIO (General Purpose Input/Output) GPIO enables external devices to access the Converge Pro serial command set, including common functions such as volume control, muting, room combining, and preset changes, via the Control/Status A and B ports. All Converge Pro devices connected via the Expansion Bus can be controlled from a single Control/Status port on any of the devices.

Hold Time The length of time that a microphone remains on after the voice (input) level drops below the gate ratio. This can be used to prevent the microphone from gating off during brief pauses in speech.

HTTP (Hyper Text Transfer Protocol) Part of the Internet protocol suite, HTTP is used to transmit information, such as HTML pages, between servers and clients on IP networks.

Last Mic Mode Sets the last-activated mic to Last On, Mic 1-8, or Off. The Last On setting leaves the last-activated mic gated on until another mic input gates on.

Macro A series of commands stored and executed together. Macros can be executed from within Converge Console, using serial commands, and within Presets.

Manual Gating Provides the ability to gate a microphone on or off manually. See also Gating.

Matrix Mixer The Converge Pro mixer that allows routing of any input or combination of inputs to an output or any combination of outputs. The Converge Pro mixer permits level control at each cross point in the matrix. See also Cross Point.

Maximum Number of Mics Sets the maximum number of mics that can be gated on simultaneously.

MIB (Management Information Base) A database file that describes networked communication devices for SNMP management purposes. See also SNMP.

Microphone Mixing The process which mixes audio signals from different microphones. All mic signals can be mixed into one signal, any or all outputs, or mixed into separate groups. Microphone signals can also be processed together or individually.

Min/Max Gain Level Yellow and green limit arrows in Console that set minimum and maximum gain levels respectively for all channels. These arrows are available on the Gain Slider for each channel type. Min/Max limits apply to all serially connected control devices, and are used to prevent users from adjusting levels beyond the specified levels.

Mixer Mode The matrix mixer in Console has two settings: master and slave. Mixer mode is configured in the Unit

Properties window. See also Matrix Mixer and Unit Properties.

Mute A condition in which an audio signal is attenuated below the audible threshold.

NLP (Non-Linear Processing) NLP increases the power of echo cancellation for difficult acoustical environments. NLP has four settings: Soft (6dB), Medium (12dB), Aggressive (18dB), and Off. NLP settings are found in the Channel Properties Configuration window for Mic Input channels.

Noise Cancellation A process which removes ambient noise from a signal.

NTP (Network Time Protocol) Part of the IP protocol suite, NTP is used for clock synchronization between devices on IP-based networks.

NOM (Number of Open Mics)/Constant Gain Mode Adjusts the output level to maintain a specified gain level based on the number of mics gated on and routed to an output.

O–R Buses These four audio buses are used for routing microphone audio between Converge Pro devices. Information about the number of gated microphones (NOM count) and other relevant information for the microphone mixers are tracked for microphones routed to these buses. See also S-Z Buses and PA Adapt/AEC Reference Bus.

Off Attenuation The amount of level reduction a microphone is given when the microphone is not gated on.

PA Adaptive Mode PA Adaptive Mode allows you to specify an output as the ambient reference. This prevents an audio signal from gating on microphones without interfering with speech from conference participants.

PA Adapt/AEC Reference This setting determines which output channel (typically a loudspeaker) is used as the reference for AEC. See also PA Adaptive Mode and AEC.

Parametric Equalizer (PEQ) A multi-band variable equalizer with control of gain, center frequency, and bandwidth. A properly configured PEQ enables Converge Pro devices to offset speaker anomalies and room acoustic imaging deficiencies.

Phantom Power Power supplied by Converge Pro units to power condenser microphones. This feature can be switched off for microphones that do not require phantom power.

Pink Noise An audio test signal containing all the frequencies in a given audio spectrum, with equal energy in each octave.

Pre-AEC Cross Point Setting a Pre-AEC Cross Point in the Matrix bypasses the cross-pointed input audio from the AEC (Acoustic Echo Cancellation) reference. This is primarily used for sound reinforcement applications to prevent mic input channel audio from being degraded by AEC artifacts. See also AEC and Matrix Mixer.

Preset Presets provide the configuration flexibility needed to meet changing conference room requirements. These changes include audio routing, gating, muting, levels, AEC referencing, and signal processing, as well as room combining and room configuration. Presets allow you to make configuration changes instantaneously—without interrupting or affecting any conferences in progress. There are 32 presets available on every Converge Pro device.

Preset Mask Defines whether a Preset executes on a low or high contact closure signal on the rear panel of the unit.

Preset Mode Preset mode is used to create presets and is accessed from the Console toolbar.

Processing Blocks Processing blocks enable you to configure filters, delay, compression, and gain to create precise audio configurations for any venue. A single input or group of inputs can be routed through a processing block and then routed to an output or multiple outputs. There are four processing blocks available for the 840T and eight for the 880 and 8I (A-D for 840T, A-H for 880 and 8I). See also Filters, Delay, Compression, and Matrix.

Q (Quality Factor) It is the ratio of the center frequency divided by the bandwidth. Q reflects an inverse relationship to the bandwidth, and is adjustable from .02:1 to 40:1.

Ratio The amount of compression applied to the output signal compared with the input signal as the signal exceeds the threshold level. See also Compressor, Compression, and Threshold.

Release Time Release is a parameter which determines how quickly compression is released after the input signal drops below the specified threshold. See also Compressor, Compression, and Ratio.

Reverberation A diffused acoustic energy field fed and maintained by sound reflections from the room surfaces.

S–Z Buses These eight buses are line input mixer buses. They are used to route auxiliary audio, such as from a CD player or VCR, to and from other units on the Expansion Bus. These buses are also used as mic mixer buses when NOM count is not required. See also Expansion Bus.

Signal Generator A device for generating a reference tone for sound system calibration purposes.

Site File Site Files allow you to store configuration settings for one or more Converge Pro devices, including Inputs, Outputs, Fader channels, Processing channels, Matrix routing, and Presets, for a specific application or venue. Site files also provide Console with the necessary information to communicate with site hardware using your PC.

Site Properties The Site Properties window opens when you select New Site from the File menu or click on the New Site button on the Console button bar. It allows you to enter information about the site as well as configure the communication and security settings.

SMTP (Simple Mail Transport Protocol) Part of the IP protocol suite, SMTP servers resolve the DNS address and recipient information used to transport email messages over IP networks. See also DNS.

Subnet Mask A subnet mask defines the range logical IP addresses used for internal network traffic, and is used by DHCP, gateway devices, and routers to distinguish between internal and external network traffic on IP networks. See also DHCP, Gateway, and DNS.

TERL (Telco Echo Return Loss) The TERL meter shows the coupling between the transmit signal and the input to the telephone echo canceller. It is the ratio of the two levels.

TERLE (Telco Echo Return Loss Enhancement) The TERLE meter shows the loss through the telephone echo cancellation process. It is the ratio of the two levels.

Threshold The upper or lower level at which a signal processing begins or terminates.

Unit Properties Unit Properties define properties for a specific Converge Pro unit. Unit Properties enable you to configure unit settings such as name, and telephone country code, as well as IP and serial communication settings. See also Site Properties.

Virtual AEC Reference Virtual AEC References allow you to combine multiple audio sources for applications where there are two speakers (left and right), combined audio/video conferencing, and audio/video teleconferencing. In these and other multiple output applications, using virtual AEC references improves AEC performance.

Web Builder Web Builder consists of User Console and Control Console. These consoles allow you to configure a subset of call management (User Console) and mixing features (Control Console) for access through a web portal integrated into the Converge Pro firmware. The web portal can be accessed over IP with Microsoft's Internet Explorer web browser (requires IE version 5.5 or later).

White Noise Acoustical noise with equal energy throughout a given frequency range.