ClearOne

CONVERGE® PRO 2
Next Generation Audio DSP Platform
Professional Audio Conferencing and Sound Reinforcement Systems

QUICK-START GUIDE

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THE CONVERGE PRO 2 AUDIO DSP PLATFORM

The CONVERGE Pro 2 is the industry's most advanced professional audio digital signal processing (DSP) platform for conferencing and sound reinforcement applications. It outperforms in any size room, any audio environment, any application.

CONVERGE Pro 2 meets a diverse range of needs, from pc-based videoconferencing, teleconferencing, VoIP, sound reinforcement to audio networking needs. It is also optimized to work with the new Beamforming Mic Array 2 and DIALOG 20 2-Channel Wireless Microphone System through its native connection, adding to the seamless experience of the platform.

OPERATING REQUIREMENTS

Power

CONVERGE Pro 2 devices automatically accommodate voltages of 100–240 V AC, 50/60Hz.

Telephone

CONVERGE Pro 2 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 2, call your local telephone company for installation. CONVERGE Pro 2 48T, 128T, and 128TD 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 2 devices to be non-compliant.

Equipment Placement

CONVERGE Pro 2 devices are designed for installation in a standard 19-inch equipment rack.

Environmental

CONVERGE Pro 2 devices are designed to operate at ambient unit temperatures between 14° F (-10° C) and 104° F (40° C).

SYSTEM REQUIREMENTS

The CONVERGE Pro 2 CONSOLE software minimum system requirements are:

Supported Operating Systems

- Windows 7
- Windows 8
- Windows 10

Minimum System Requirements

- Intel or AMD 6 with 1GHz or higher recommended
- 2GB RAM Minimum (or higher recommended)
- 500MB hard disk space minimum (Additional space is required to store the site files and other project files)
- USB or Ethernet Network Interface to connect your computer with CONVERGE Pro 2 product

Minimum Software Requirements

- Administrator permission to install and run the software

IMPORTANT SAFETY INFORMATION

Read all safety information before using this product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet. The device must be connected to a earth grounded socket. For Norway: Apparatet må tilkoples jordet stikkontakt. For Sweden: Apparaten skall anslutas till jordat uttag. For Finland: Laite on liitettävä suojakoskettimilla varustettuun pistorasiaan.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Use the mains plug to disconnect the apparatus from the AC mains. The mains plug shall remain readily operable. For France: Utilisez la prise secteur pour débrancher l'appareil à partir du secteur. La prise secteur doit rester facilement accessible.
16. To completely disconnect unit power from the AC mains, disconnect the unit's power cord from the mains socket. To reconnect power, plug the unit's power cord into the mains socket following all safety instructions and guidelines. For France: Pour alimentation de l'unité de couper entièrement l'alimentation secteur, débranchez le cordon d'alimentation de l'appareil de la prise de courant. Pour rétablir le courant, branchez le cordon d'alimentation de l'appareil dans la prise de courant en suivant toutes les instructions et les directives de sécurité.
17. Caution: Danger of explosion if lithium battery is incorrectly replaced. Replace only with the same or equivalent type. Battery should only be replaced by qualified personnel and is not intended as a user serviceable part. Do not expose batteries or battery pack to excessive heat such as prolonged sunlight, fire or other heat sources. For France: Attention: Danger d'explosion si la pile au lithium est remplacée de façon incorrecte. Remplacez uniquement avec le même type ou équivalent. Batterie ne doit être remplacé par du personnel qualifié et ne vise pas comme une partie réparable par l'utilisateur. Ne pas exposer les piles ou batterie à une chaleur excessive comme la lumière du soleil prolongée, le feu ou d'autres sources de chaleur.
18. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in fire or electric shock.
19. This product can interfere with electrical equipment such as tape recorders, TV sets, radios, computers and microwave ovens if placed in close proximity.
20. Class 2 Wiring IS REQUIRED for these devices. Wiring and install should only be performed by qualified personnel.
21. For CONVERGE Pro 2 products that include a telephone circuit, Underwriters Laboratories (UL) requires these safety notifications:

Caution: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.
   • When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:
   • Do not use this product near water for example, near a bathtub, washbowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
   • Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
   • Do not use the telephone to report a gas leak in the vicinity of the leak.
   • Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.
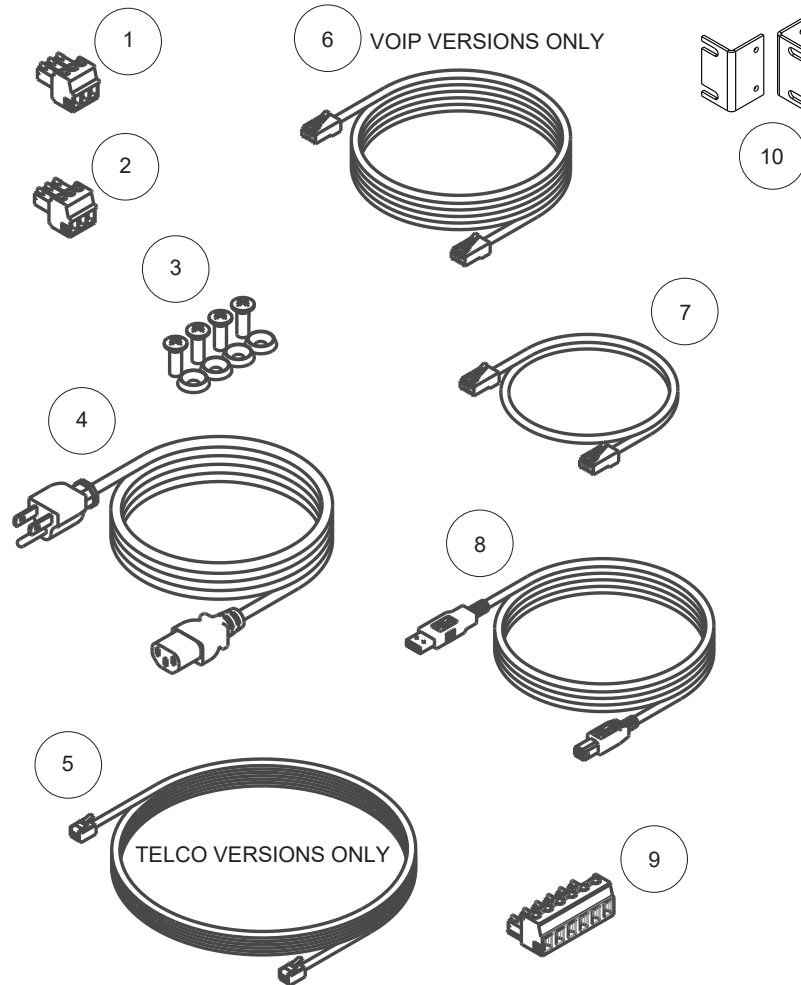
WARNING: TO PREVENT FIRE OR ELECTRICAL SHOCK HAZARD, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
AVIS: RISQUE DE CHOC
ELECTRIQUE - NE PAS OUVRIR

THE LIGHTNING FLASH AND ARROW HEAD WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF DANGEROUS VOLTAGE INSIDE THE PRODUCT

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

THE EXCLAMATION POINT WITHIN THE TRIANGLE IS A WARNING SIGN ALERTING YOU OF IMPORTANT INSTRUCTIONS ACCOMPANYING THE PRODUCT.

SEE MARKING ON BOTTOM / BACK OF PRODUCT

Use only in non-tropical locations.

Use only at altitudes of 2000 meters or less.

Save These Instructions

UNPACKING

Use the illustrations below to verify that you have received all components. ClearOne is not responsible for product damage incurred during shipment. Inspect your shipment carefully for obvious signs of damage. If the shipment appears damaged, retain original boxes and packing material for inspection by the carrier, and contact them immediately. The following items are included with your CONVERGE Pro 2 unit:

CONVERGE Pro 2 Package Contents

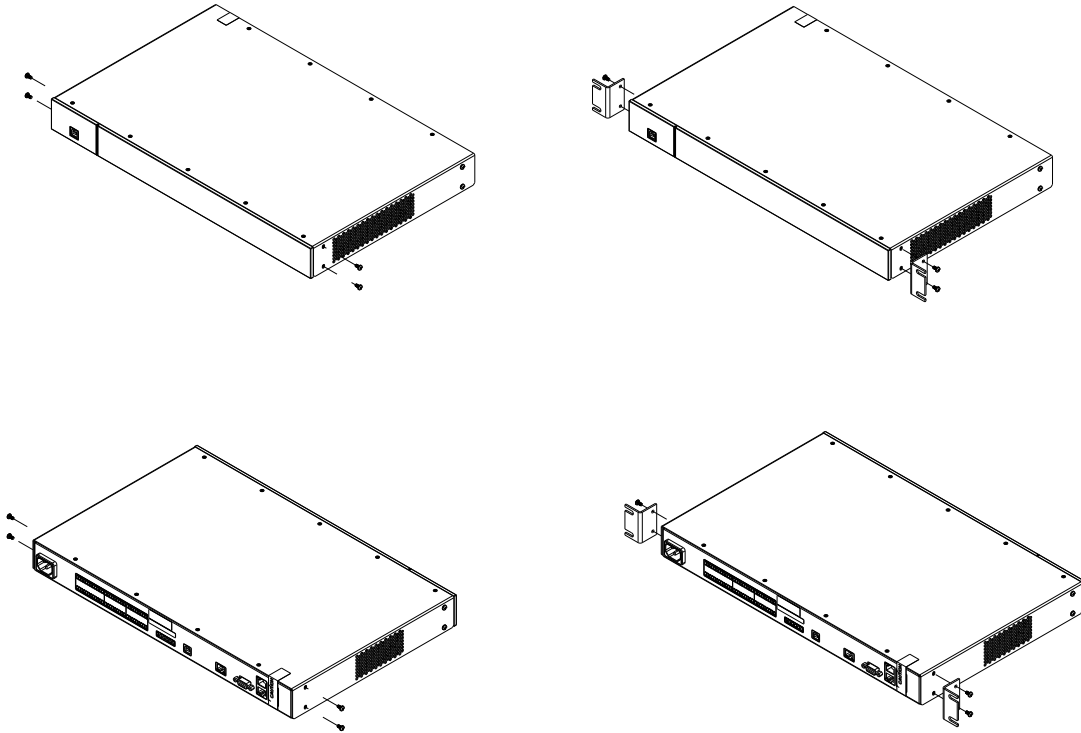| Item No.	Description	128, 128D, 128SR, 128SRD	128T, 128TD	128V, 128VD	120	012	48T	48V
1	Terminal Block Connector, 3 pos. (Orange)	12	12	12	12	0	4	4
2	Terminal Block Connector, 3-Pos. (Black)	8	8	8	0	12	8	8
3	#10-32 Screw/Washer Kit	1	1	1	1	1	1	1
4	Grounded Power Cord 6'	1	1	1	1	1	1	1
5	Telephone Cable, 12'	0	1	0	0	0	1	0
6	RJ-45/RJ-45 Patch Cable, 7'	0	0	1	0	0	0	1
7	RJ-45/RJ45 Patch Cable, 18'	1	1	1	1	1	1	1
8	USB Type A to Type B Cable, 6'	1	1	1	1	1	1	1
9	Terminal Block Connector, 6 pos. (Green)	1	1	1	1	1	1	1
10	Rack Ears Kit	1	1	1	1	1	1	1
11	CONVERGE Pro 2 Quick Start Guide	1	1	1	1	1	1	1

MOUNTING

Installation

Your CONVERGE Pro 2 product comes with rack mount ears that fit a standard 19" rack, and a screw/washer kit. Rack mounting eliminates the need for space between multiple units.
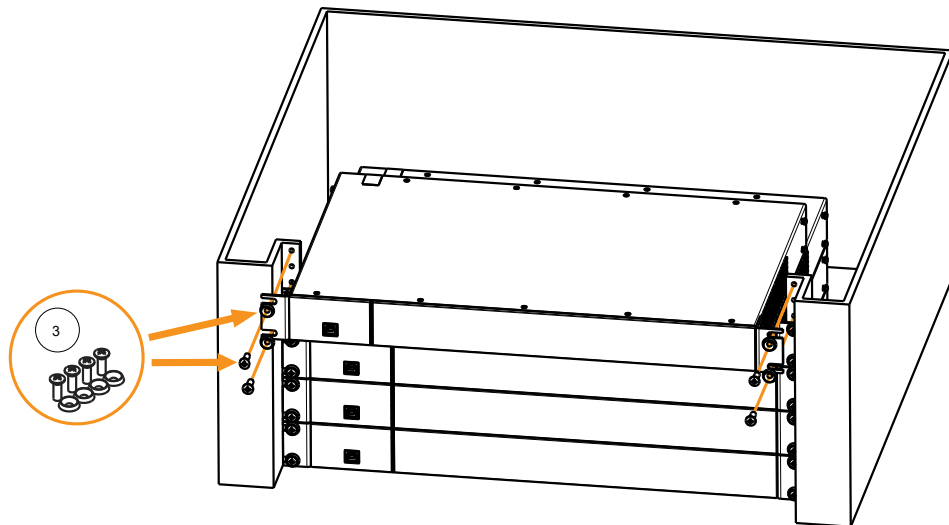
To change position of your rack ears:

1. Remove two screws from each side near front/rear (depending on which side you want facing front of rack),
2. Attach rack ears using screws that were removed previously.

The following shows two options: 1) mounting to the front (standard) and 2) mounting to the back.

Mount the unit by securing the rack-mount ears to two posts or mounting strips in the rack using the four screws and washers provided. Because the rack-mount ears support the weight of the entire chassis, be sure to use all four screws and washers to fasten the two rack-mount brackets to the rack posts.

CONTROLS AND CONNECTIONS

Refer to the following diagrams and descriptions for CONVERGE Pro 2 front panel controls and back panel connectors.

CONVERGE Pro 2 Front Panel

CONVERGE Pro 2 Front Panel Control Descriptions

A. USB Type B Port: Provides convenient front panel connectivity for laptops, MAC, and PCs.
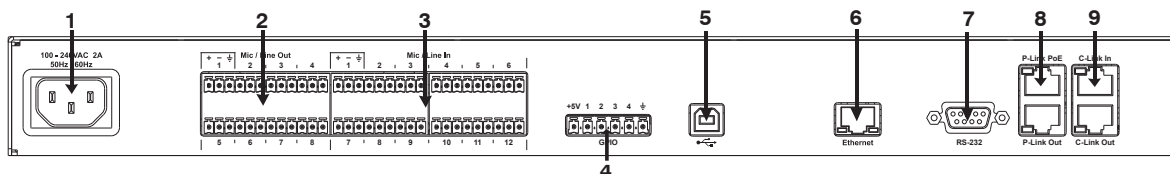
B. LED
- » Power: Solid blue indicates the unit is powered on.
- » Status:
  - Off (no light): Unit still initializing
  - Fast blinking blue: Stack Syncing in progress
  - Slow blinking blue: Unit not configured
  - Solid blue: Configured unit
  - Fast blinking red: Stack Sync error
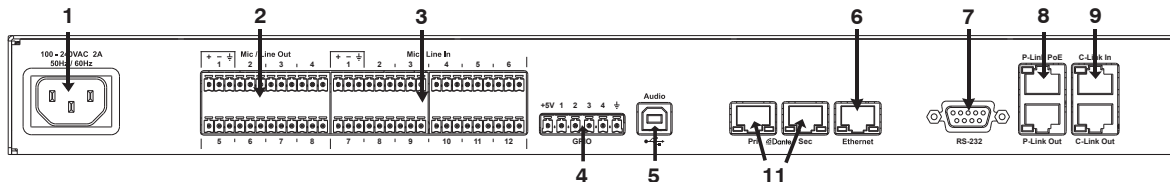- » Locate: Blinking blue indicates that the "Locate" command has been received.

C. Locate Button (C): "Locate" Capacitive Touch Button identifies hardware devices from software, or software applications from hardware devices. Shows model number, unit name, IP address.
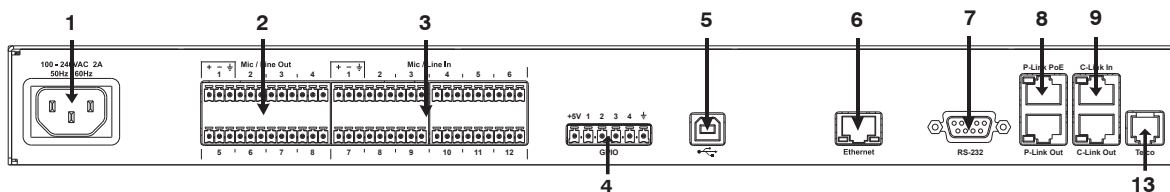
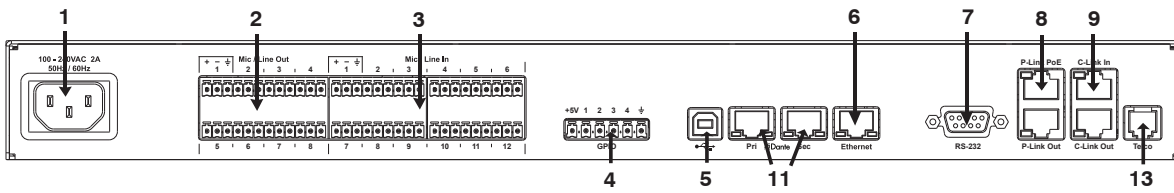## CONVERGE Pro 2 Rear Panels

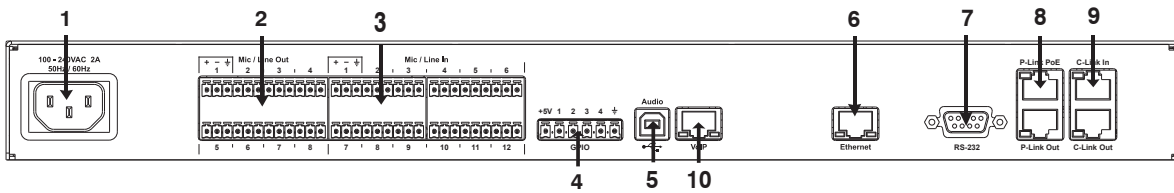### 128 & 128SR Rear Panels
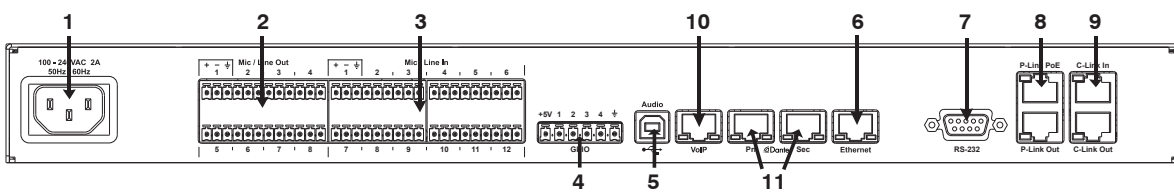

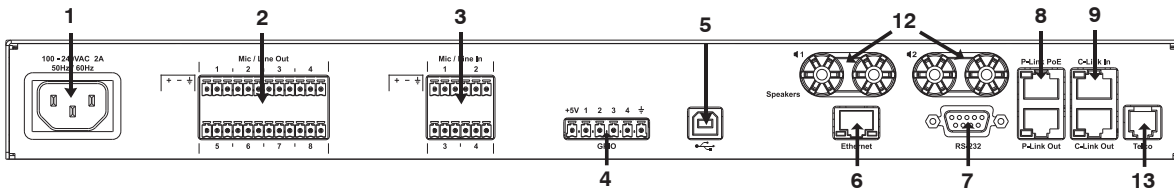### 128D & 128SRD Rear Panels

128T Rear Panel

128TD Rear Panel
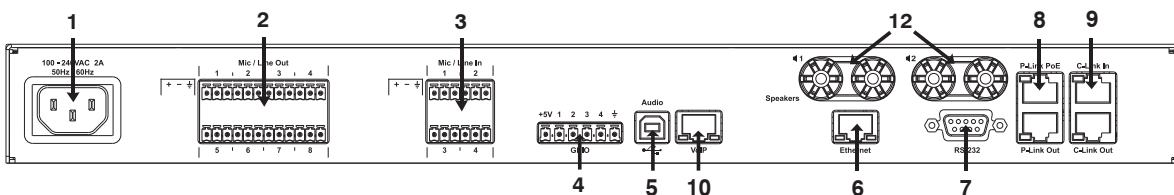
128V Rear Panel

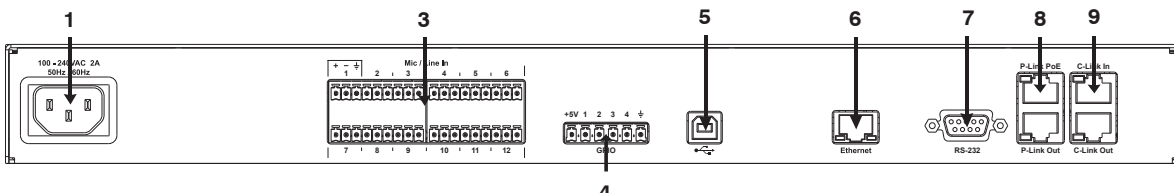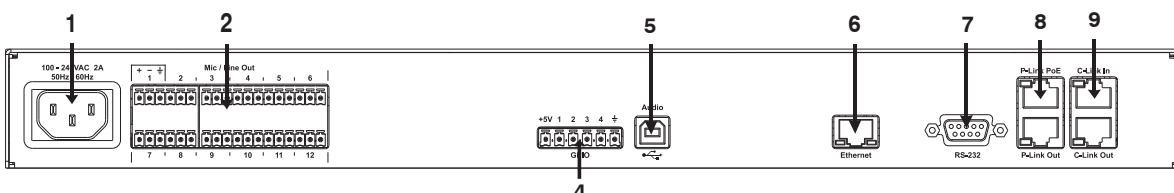**128VD Rear Panel**

48T Rear Panel

48V Rear Panel

120 Rear Panel

012 Rear Panel

CONVERGE Pro 2 (CP2) Rear Panel Connectors

1. **AC Power**: IEC connector, 100 – 240VAC auto-adjusting, 50/60Hz.

   ⚠️ **Warning**: This equipment must be connected to an AC mains socket outlet with a protective earthing connection. The third prong of this connector (ground) is an important safety feature. Do not attempt to disable this ground connection by using an adaptor or other method.

2. **Mic/Line Outputs**: Mini-terminal push-on connector for line-level outputs (128, 128D, 128T, 128TD, 128V, 128VD, 48T, 48V, 012, 128SR, 128SRD).

3. **Mic/Line Inputs**: Mini-terminal push-on block connector for any combination of microphone and/or line level inputs. (128, 128D, 128T, 128TD, 128V, 128VD, 120, 128SR, 128SRD: 12 inputs. 48T and 48V: 4 inputs).

4. **GPIO**: Mini-terminal push-on block connector for control, status, variable voltage control.

5. **Type B USB Port**: Provides bi-directional audio connectivity between laptops/MAC/PCs and CP2 units.

6. **LAN Ethernet Port**: A RJ-45 10/100Mbps auto-sensing Ethernet port. The LAN port connects CP2 devices to a network.

7. **RS-232 Serial Port**: Female DB9 connector for connecting to a laptop, computer, or remote control serial devices (such as AMX and Crestron controllers).

   NOTE: CONVERGE CONSOLE software connects through USB or Ethernet only.

8. **P-Link (Peripheral Link) In and Link Out Ports**:
   » The P-link ports provide Power, Audio & Control for peripheral devices such as the Beamforming Mic Array 2 (BFM2) and DIALOG 20 2 Channel Wireless Receiver.
   » The P-Link In Port is also used as PoE-In Port, so this port can be used to connect PoE Injector to provide power to peripheral devices.
   » One PoE injector can provide power for up to 3 peripheral devices.
   » Maximum cable length is 650 feet for a Long Distance P-Link chain of up to 3 BFM2 units. Maximum cable length is 200 feet (Regular P-Link) for all other P-Link device types.

S. No.	Feature	Regular P-Link	Long Distance P-Link
1	Applicable to all CP2 units	YES	NO (only supports CP2 AEC units)
2	Applicable to all peripheral units (BFM2, DIALOG 20 Receiver, USB Expander, GPIO Expander)	YES	NO (only supports BFM2)
3	Same CP2 and BFM2 hardware (no hardware changes, only software and firmware upgrades)	YES	YES
4	Applicable to already sold and installed units	YES	YES
5	Maximum distance between units	200 feet (~60 meters)	650 feet (~200 meters)
6	Carries power, audio, control	YES	YES
7	Maximum number of peripheral devices in one P-Link chain	12 (3 each: BFM2, DIALOG 20, USB Expander, GPIO Expander)	3 (3 BFM2 only)
8	Cable specification	CAT5e/CAT6, 24 AWG, solid conductor cable. Do not use Copper Clad Aluminum (CCA).	CAT6, 550 MHz, 23 AWG, solid conductor cable. Do not use Copper Clad Aluminum (CCA).
9	PoE Power Injector spec	56V, Mode B, Midspan – For 3 BFM2 units 48V, Mode B, Midspan – For 1 BFM2 unit	56V, Mode B, Midspan – For 3 BFM2 units 48V, Mode B, Midspan – For 1 BFM2 unit
10	No extra cost, free to upgrade	YES	YES

   » Up to 12 peripheral devices can be connected in a Regular P-Link chain. You can connect 3 each of the BFM2 units + DIALOG 20 units + USB Expander + GPIO Expander per CONVERGE Pro 2 (CP2) unit. Up to 6 BFM2 units can be connected in a Regular P-Link chain to a stack of two CP2 units.
   » It uses a standard (not crossover) patch cable.
   » LEDs adjacent to each port indicate connection status and packet traffic activity.

9. **C-Link In and Link Out Ports**: Two RJ-45 E-bus (expansion bus) connectors used to connect multiple CONVERGE Pro 2 units together to create a site. You can connect any combination of CONVERGE Pro 2 units, where the total number of microphone inputs does not exceed 96. Maximum cable length is 150 feet using solid core, factory terminated Category 5e or 6 cable.

⚠ **WARNING**: Use the **C-Link In** and **C-Link Out** ports with CONVERGE Pro 2 Devices ONLY. Connecting ANY other devices to the C-Link In and C-Link Out ports, including CONVERGE Pro or Beamforming Microphone Array products will result in severe equipment damage.

10. **VoIP**: A RJ-45 10/100Mbps auto-sensing Ethernet port connecting to 5 lines, with each line supporting up to 5 calls (128V, 128VD, 48V).

11. **Dante Primary & Secondary Ports**: Two RJ-45 100/1000 Mbps Ethernet connectors for connecting to primary and secondary Dante networks. Maximum cable length is 328 feet (128D, 128TD, 128VD, 128SRD).

12. **2-Channel Speaker Posts**: Two post/banana plug connectors used to connect an external speaker (4Ω – 16Ω). Internal power amplifiers eliminate the need for an external power amplifier (48T, 48V).

13. **Telco Line Port**: One RJ-11 connector telephone port. The Telco port connects an analog telephone line to CONVERGE Pro 2 devices (128T, 128TD, 48T).

NOTE: The Telco port is not available for use when the telephone hybrid is off-hook.

CONFIGURING THE CONVERGE PRO 2

CONVERGE Pro 2 CONSOLE software is required for configuring CONVERGE Pro 2 units. Configuration instructions can be found in the CONVERGE Pro 2 Installation and User Manual at www.clearone.com.

APPLICATION PROGRAMMER'S INTERFACE

The CONVERGE Pro 2 Serial Commands Reference Guide is available for viewing or download at www.clearone.com.

COMPLIANCE

CE COMPLIANCE
Details on CE compliance can be found on the ClearOne website under "Resource Library".

FCC PART 68 COMPLIANCE

US:FBIBR01ACNVRGPRO2

Ringer Equivalence Number (REN): 0.1A

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.

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 2 devices to be non-compliant.

If you experience problems with this equipment, contact: ClearOne, Inc., 5225 Wiley Post Way, Suite 500Salt 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 Inc. 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,

IC COMPLIANCE

IC: 1970A-CNVRGPRO2

Ringer Equivalence Number (REN): 0.1

This product meets the applicable Industry Canada technical specifications. / Le présent matériel est conforme aux specifications techniques applicables d'Industrie Canada.

The Ringer Equivalence Number (REN) is an indication of the maximum number of devices allowed to be connected to a telephone interface. The termination of an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices not exceed five. / L'indice d'équivalence de la sonnerie (IES) sert à indiquer le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas cinq.

CONTACT INFORMATION

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