# ClearOne

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

The 48T model mixer has 4 inputs with AEC, 8 outputs, built-in Telephone interface, USB audio; GPIO, RS232, IP control interfaces; and P-Link and C-Link expansion buses.

CONVERGE Pro 2 is optimized to work with the new Beamforming Mic Array 2 and DIALOG® 20 2-Channel Wireless Microphone System through its native connection.

## Powerful Architecture

+ 4 Mic/Line inputs with AEC
+ Built-in Telco with ClearEffect™ processing
+ Built-in USB for PC-based conferencing
+ Reduced footprint and power consumption

## Audio Signal Processing

+ Next-gen Acoustic Echo Cancellation processing
+ Distributed Echo Cancellation® on every mic input
+ Noise Cancellation with Adaptive-Ambience
+ Acoustic Intelligence with faster convergence
+ DARE™ feedback elimination
+ Advanced microphone gating

## Scalable Connectivity

+ Standalone and daisy-chained system
+ Stack up units up to 144 Mic/Line inputs
+ Expansion bus "C-Link" with 150 channels
+ "P-Link" bus to connect peripheral devices

## Applications

+ POTS conferencing
+ PC-based conferencing & Unified Communications

## Configuration & Management

+ New CONSOLE® software
+ Auto-discovery of devices
+ MatrixView™ for entire system
+ FlowView™ for visualized audio signal paths
+ System monitoring and troubleshooting

## Flexible Control Options

+ Dialer app for Windows, Mac, iOS, Android
+ Touch Panel Controller with tabletop and wall mount options
+ 3rd-party control modules

## APPLICATIONS

Boardrooms

Conference Rooms

Huddle Rooms

Training Rooms

Lecture Halls

Courtrooms

Auditoriums

Telemedicine Facilities

**Front Panel**

Capacitive Touch Button

Mounting Rack Ears

USB-B for connecting to CONSOLE software

LEDs
1. Status
2. Location
3. Power

Mounting Rack Ears

**Back Panel**

4 GPIO Ports for Control
2 Inputs and 2 Outputs

Speakers

RJ-45 P-Link In / PoE

RJ-45 C-Link In

100-240V AC, 50/60Hz Power

3.81mm Mic / Line Outputs

3.81mm Mic / Line Inputs

USB-B for Audio

Network Port

RS232 for Serial Commands

RJ-45 P-Link Out

C-Link Out

Telco

| CONVERGE Pro 2 | Conferencing | | | | | | | | | | Sound Reinforcement | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 128 | 128D | 128T | 128TD | 128V | 128VD | **48T** | 48V | 120 | 012 | 128SR | 128SRD |
| **System** | | | | | | | | | | | | |
| Mic/Line inputs | 12 | 12 | 12 | 12 | 12 | 12 | **4** | 4 | 12 | ✗ | 12 | 12 |
| Mic/Line outputs | 8 | 8 | 8 | 8 | 8 | 8 | **8** | 8 | ✗ | 12 | 8 | 8 |
| AEC | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| C-link expansion bus | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| P-link peripheral bus | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| USB audio interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ethernet, RS-232, GPIO interface | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Applications** | | | | | | | | | | | | |
| Built-in USB for PC-based conferencing | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ |
| Built-in Telco for teleconferencing | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| Built-in VoIP for VoIP conferencing | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Microsoft Skype for Business audio conferencing | ✗ | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Sound Reinforcement applications | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Built-in Dante for audio networking | ✗ | ✓ | ✗ | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ |
| **Peripheral Devices** | | | | | | | | | | | | |
| Beamforming Mic Array 2 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✗ | ✗ | ✗ |
| DIALOG® 20 - Wireless Mic System | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| GPIO Expander | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| USB Expander | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Configuration, Management & Control** | | | | | | | | | | | | |
| New CONSOLE® software | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Dialer app - Win, Mac, iOS, Android | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Touch Panel Controller | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Third-party control modules | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## PRODUCT SPECIFICATIONS

*Unless otherwise specified, all measurements are performed with a 20Hz to 22kHz BW (no-weighting).*

### MIC/LINE INPUTS & OUTPUTS

**Inputs:** Balanced audio inputs, 3.81mm Orange color Phoenix/Euroblock type male header, Push-on mini-terminal block

**Outputs:** Balanced audio outputs, 3.81mm Black color Phoenix/Euroblock type male header, Push-on mini-terminal block

**Frequency Response:**
20Hz – 22kHz @ +4dBu, +/- 0.5dBu

**EIN (Equivalent Input Noise):**
20kHz BW, max gain, Rs = 150Ω, -126dBu

**THD + N (Total Harmonic Distortion + Noise):**
- 20Hz – 22kHz @ +4dBu, line level, 0.006%
- 20Hz – 22kHz @ -56dBu, mic level, <0.04%

**Dynamic Range:**
20Hz – 20kHz @ 0dB, >105dB

**Crosstalk (Mic/Line):**
Channel to Channel, stimulus at 20dBu to receptor at -56dBu, 1kHz, < -98dB

**Input Impedance:**
Balanced (line to ground), 2.2kΩ, 1%

**Nominal Input Level:**
Adjustable -56dB to 0dB, 7dB step coarse gain

**Maximum Input Level:** -65dBu to 20dBu

**Phantom Power:** 48V, Impedance 6.81kΩ

**Output Impedance:**
Balanced (line to ground), 95Ω, 1%

**Output Level:**
0dBu (Nominal), 20dBu (Max), -40dBu (Selectable)

### USB AUDIO

**Port Type:** USB-B connector

**Audio:** Digital Audio, 2 x 2 bidirectional channels

**Sample Rate:** 48kHz

**Sample Bit Depth:** 24-Bit

**Compatible:**
- USB 2.0
- USB 3.0

### TELEPHONE

**Port Type:** RJ11

**Frequency Response:**
- Mic/Line Input to Telephone Out: 250Hz – 3.4kHz , +/- 2dB, 4dBu
- Telephone In to Mic/Line Out: 250Hz – 3.4kHz, +/- 2dB, -15dBu

**THD + N:**
- Mic/Line Input to Telephone Out: <0.1% @ 4dBu
- Telephone In to Mic/Line Out: <0.3% @ -15dBu

**Dynamic Range:**
- Mic/Line Input to Telephone Out: >67dBu
- Telephone In to Mic/Line Out: >87dBu

**REN:** Ringer Equivalent Number 0.2

**Transhybrid Balance:** 30dB (1kHz, all AC terminations)

### ETHERNET

**Port Type:**
RJ-45, 10/100Mbps Ethernet Network, Auto Negotiation

**IP address:** IPv4 (IPv6 upgradeable through future s/w, f/w upgrade)

### AMPLIFIER OUTPUT

**Speaker Output Port:** Dual binding posts

**Audio:** 2 Channels

**Output Power:** 10W Max, 8Ω load

**Frequency Response:**
20Hz – 22kHz @ +10dBu, +/- 0.5dBu

**THD + N:** 20Hz – 22kHz @ +10dBu, 1W, <0.3%

**Dynamic Range:**
20Hz – 22kHz @ 20dB, >102dB, with 20kHz digital low pass filter

### Crosstalk:
Channel to Channel, stimulus at 20dBu, 10W output to receptor 8Ω load, 20Hz – 22kHz, < -70dB

### C-LINK EXPANSION BUS

**Ports Type:** RJ-45 (Cat5e or Cat6)

**C-Link In & Out:** Proprietary Expansion Bus

**Audio:** 150 Expansion channels

**Cable:** Solid core, factory terminated Cat 5e or 6 cable

**Distance:** Up to 80' (24M)

### P-LINK PERIPHERAL BUS

**Ports Type:** RJ-45 (Cat5e or Cat6)

**P-Link In & Out:** Proprietary Peripheral Bus

**PoE In:**
- P-Link In Port
- PoE 802.3af Mode B, Midspan
- Power on "spare pairs" 4,5 and 7,8
- Input voltage range: 48V to 56V

**Audio:** Up to 3 Beamforming Microphone Array 2 units + up to 3 DIALOG 20 Wireless Receiver units + Up to 3 USB Expander units + Up to 3 GPIO Expander units

**Cable:** Solid core, factory terminated Cat 5e or 6 cable

**Distance:** Up to 200' (60M)

**Long Distance P-Link:**
- Increases P-Link distance from 200 Ft to 650 Ft
- 650 Ft (200M) maximum cable distance between any two units
- Cat6, 550 MHz, 23 AWG, solid conductor cable
- Do not use Copper Clad Aluminum (CCA) cable
- Available only for BFM2 peripheral units
- 48V PoE Midspan Mode B power injector for 1 BFM2 unit
- 56V PoE Midspan Mode B power injector for 3 BFM2 units

### RS232

**Port Type:** DB9 Female

**Settings:** 9600/19200/38400/57600/115200 Baud; Serial Echo; Flow Control

**Support:** Serial commands

### GPIO

**Port Type:**
5.08mm Green color Phoenix/Euroblock type male header

**Support:** Control, Status, Variable Voltage Control

**Power Pin:** 5V DC @ 350mA Power Source

**Pin 1 to 4:**
- Open Collector Outputs: 40VDC @ 250mA
- Active Outputs (Source/Sink): 5VDC @25mA
- Logic Inputs: 40.2kΩ pull up
- Variable Voltage Control Inputs: 5VDC max

**Ground Pin:** GND

### USB CONTROL

**Port Type:** USB-B connector

**Location:** Front Panel

**Compatible:**
- USB 2.0
- USB 3.0

### LEDs

**Location:** Front Panel

**Status LED:**
- Off: Unit still initializing
- Blue - Fast Blinking: Stack Syncing in progress
- Blue - Slow Blinking: Unit not configured
- Blue - Solid: Configured unit
- Red - Fast Blinking: Stack Sync error

**Locate LED:**
Blue - Blinking: Unit "Locate" command received

**Power LED:**
Blue - Solid: Unit is powered on

### TOUCH SENSOR

**Sensor Type:** Capacitive Touch Button

**Location:** Front Panel

### POWER & THERMAL

**Port Type:** AC Inlet

**Mains Voltage:** 100-240V AC, 50/60Hz

**Power Consumption:** 50 Watts Typical

**Thermal:** 170 BTU/Hr Typical

**Operating Temperature:**
14°F (-10°C) to 104°F (40°C) Ambient Temperature

### DIMENSION & WEIGHT

**RU size:** 1 RU

**Width x Depth x Height:**
1. Without rack-ears: 17"W x 10.73"D x 1.72"H (43.2cmW x 27.3cmD x 4.4cmH)
2. With rack-ears: 19"W x 10.73"D x 1.72"H (48.3cmW x 27.3cmD x 4.4cmH)

**Unit Weight:** 9.3 lbs (4.2 kg) (Approximately)

**Shipping Weight:** 13.8 lbs (6.3 kg) (Approximately)

### PACKAGE

**Power Cord:** 6' (1.8M), Grounded, Qty 1

**Input Connectors:**
Terminal Block Connector, 3 Position (Orange), Qty 4

**Output Connectors:**
Terminal Block Connector, 3 Position (Black), Qty 8

**GPIO Connector:**
Terminal Block Connector, 6 Position (Green), Qty 1

**C-Link Cable:**
RJ-45 To RJ-45 Cable, 18" (45.7cm), Qty 1

**Telephone cable:** 12' (3.6M), Qty 1

**USB Cable:** USB Type A to Type B, 6' (1.8M), Qty 1

**Rack Ears:** Pre-installed, Qty 2

**Screw/Washer Kit:** Rack Decor, Qty 4

### PART NUMBERS

| Part Number | Product |
|---|---|
| 910-3200-001 | CONVERGE Pro 2 128 |
| 910-3200-001-D | CONVERGE Pro 2 128D |
| 910-3200-002 | CONVERGE Pro 2 128T |
| 910-3200-002-D | CONVERGE Pro 2 128TD |
| 910-3200-003 | CONVERGE Pro 2 128V |
| 910-3200-003-D | CONVERGE Pro 2 128VD |
| **910-3200-005** | **CONVERGE Pro 2 48T** |
| 910-3200-006 | CONVERGE Pro 2 48V |
| 910-3200-004 | CONVERGE Pro 2 120 |
| 910-3200-007 | CONVERGE Pro 2 012 |
| 910-3200-101 | CONVERGE Pro 2 128SR |
| 910-3200-101-D | CONVERGE Pro 2 128SRD |