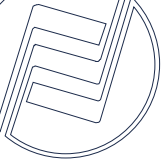


Audio, Video and
Communications
for Broadcasters



CAPITOL IP

Ultra-Compact, Networked Digital
Audio Console for Radio and Television

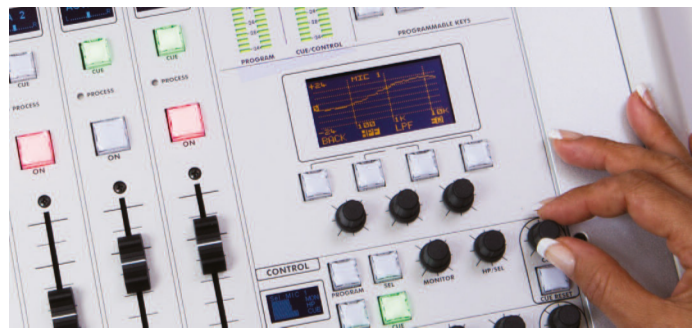


Product Overview

The **AEQ CAPITOL IP** is an 8 channel digital mixing console based on the AEQ CAPITOL console and the experience gained with this model. The control surface has been redesigned with new softer buttons, more programmable keys and a new arrangement of the monitoring section controls. AoIP multi-channel networking connectivity in CAPITOL IP console is implemented through a single module with 16 input and 16 output channels incorporated in its core.

The AEQ CAPITOL IP makes networked digital audio technology available to radio and TV stations at more than reasonable costs but with "Top-notch" performance.

AEQ CAPITOL IP was conceived taking into account our customers needs for a versatile, powerful, easy to use and not less importantly, very cost efficient digital mixer with networking capabilities.



Just as the FORUM, the AEQ CAPITOL IP is a digital audio mixing console specifically designed to meet the most rigorous demands of the radio and television broadcast industry. Its flexible design allows it to be readily adapted to any ON-AIR application.

The AEQ CAPITOL IP incorporates all of the features necessary at the majority of stations: IP Multi-channel audio networking, automatic monitor speaker cut-off, cough muting, fader-start, control signalling, interface signalling for automation of external equipment, external communications management, intercom, etc.

This compact console solution consists in a control surface and a 2RU mixer engine. There are two versions of the CAPITOL IP control surface; a counter-sunk or flush-mount control surface that measures only 48,26 x 35,6 cm - 19"x14" (8RU) and a Desktop version with wooden side panels - 56x46 cm - 22"x18". Thanks to its design and reduced footprint, AEQ CAPITOL IP adapts perfectly to any environment: auto-control, studio control, television production, sound production, mixed configurations, integration in large installations, etc.

The CAPITOL IP's control surface with its 8 faders and complete control sections can be substituted or supplemented with a "VIRTUAL CAPITOL" software application for either Windows or iOS. The application faithfully reproduces every detail of the control surface and all the operational features of switches, rotary encoders and faders. It also shows all information and internal menus that are visible in every display of the physical control surface. This application opens new possibilities to install fully remote controlled equipment at more than affordable prices. Used as a remote control, the application provides the user with total control of all the features and functions of the mixing console - including the remote representation of the Vumeters. Truly, the CAPITOL IP can be used in a completely unattended broadcast station!

One of the primary features that make the CAPITOL IP an outstanding choice is its internal routing capability in combination with the available number of inputs: 4 selectable Mic/Line Inputs, 12 Analogue Inputs, 4 AES/EBU Digital Stereo Inputs, 2 USB Digital Stereo Inputs for broadcast automation, 2 optional Inputs through Digital telephone Hybrids. Additional input signals are available via either an optional AoIP multi-channel Ethernet connector for 16 channels or a MADI multi-channel fiber-optic link for 64 input signals.

The Output section of the CAPITOL IP is not less impressive; 8 analog Outputs, 4 AES/EBU Digital Stereo Outputs, 2 USB Digital Stereo Outputs for broadcast automation, 2 optional Outputs through Digital Telephone Hybrids.

Additional output signals are available via either an optional AoIP multichannel Ethernet connector for 16 channels or a MADI multi-channel fiber-optic link for 64 output signals. Further, the console counts on Outputs for Control room headphone, Studio primary and secondary Headphones, Control, Studio and CUE monitors.

Main Features



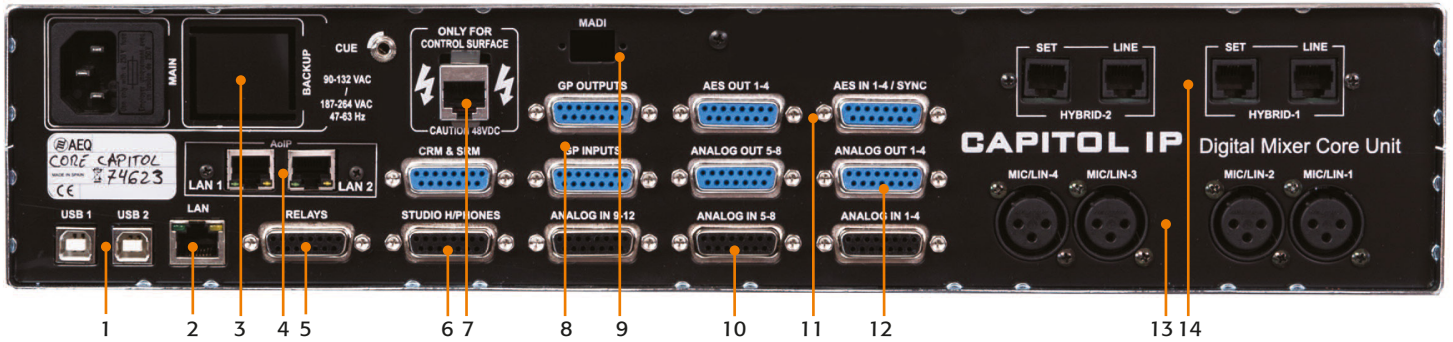
Each of CAPITOL IP's basic functions such as setup, level adjustment, and signal routing have their own specific control for each channel. Less used settings are grouped into contextual controls common for all channels and are accessible by just one or two button pushes: simplicity and ease of use provides for very dynamic system control and greatly reduces operator error.

CAPITOL IP's configuration allows any signal present within the system to freely be assigned to any control channel and signal distribution and routing configuration is done on the control surface itself. Signals that are not assigned to any specific channel can even so be routed with total flexibility. Input and Output levels can also be easily adjusted.

CAPITOL IP has a built-in memory bank where each signal's settings are stored: signal distribution via the control surface, output bus routing, setup parameters, effects, etc. This allows the console to easily be adapted to different programming needs and unique technical requirements.

The Ethernet connector enables external connectivity for the optional software applications "CAPITOL SCREEN" and "VIRTUAL CAPITOL IP" that provides the mixer with a powerful remote control.





- 1 USB digital audio Inputs/Outputs
- 2 LAN
- 3 Optional redundant Power supply
- 4 Optional Audinate/DANTE™ Technology AoIP Digital audio multi-channel Network connection
- 5 Relay GPO
- 6 Monitor Output
- 7 Control surface connection

- 8 Opto-coupled GPI-GPO
- 9 Optional MADI Digital audio multi-channel connection
- 10 Analog Inputs
- 11 AES/EBU Inputs/Outputs
- 12 Analog Outputs
- 13 Mic./Line Inputs
- 14 Optional dual line digital telephone hybrid

As with the rest of AEQ’s audio mixing consoles, a major design consideration of the CAPITOL IP was its ease of installation and configuration. Therefore its 2RU auto-ventilated audio engine can be installed wherever required. The only communication link required between the engine and the control surface is a CAT-5 cable.

CAPITOL IP’s flexible I/O capabilities allows it to be interfaced with external devices for cough muting, device remote control, ON-AIR lights, etc. by using its General Purpose Inputs and Outputs. CAPITOL IP is well prepared with a total of 8 opto-coupled GPI’s, 8 optocoupled GPO’s and 4 GPO’s with relays.

CAPITOL IP also has a built-in Ethernet port for configuration and control through Software applications for Windows based PC’s.

For monitoring and control, the CAPITOL IP audio engine has a set of pre-defined I/O’s for Control room Headphones, Studio primary and secondary Headphones, Control, Studio and CUE monitors. It is possible to configure an additional bus to be used for secondary headphones monitoring and that will provide for independent talkback and control intercom.

The Basic audio Inputs and Outputs are:

Inputs:

- 4 mic./line mono inputs, configurable with phantom power.
- 2 USB (I/O) digital stereo inputs
- 4 AES/EBU digital stereo inputs that can be configured as SPDIF
- 12 analog inputs (can be configured as mono inputs or as 6 stereo inputs)

Output:

- 2 USB (I/O) digital stereo outputs
- 4 AES/EBU digital stereo outputs that can be configured as SPDIF
- 8 analog outputs (can be configured as mono inputs or as 4 stereo outputs alternatively 3 stereo outputs and one secondary headphone output)

Dedicated control and monitoring outputs:

Analog stereo outputs for Control , Studio , CUE and Studio primary Headphone monitoring.

Analog stereo outputs for amplified Control Headphones, jack ¼”.

Options:

Dual line Digital Telephone Hybrid with two RJ-11 Line connectors and two RJ-11 connectors for Telephone SET. Telephone Hybrid remote control is accomplished through the programmable keys in the control section of the CAPITOL IP.

For IP Audio networking and general purpose audio inputs and outputs, CAPITOL IP can be fitted with Audinate/DANTE™ AoIP Multi-Channel connectivity or a MADI Link. Such additional input and output signals are available via either two optional AoIP multi-channel Ethernet connector for 16 channels or a MADI multi-channel fiberoptic link for 64 input/output signals.

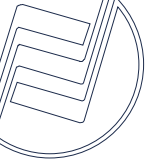
A second AC power supply can be installed in the 2RU Engine of the CAPITOL, providing the system with redundant power supply.

To facilitate cabling, optional audio and data cables with pre-installed DB connectors are available from AEQ upon request.



Control Headphones

Protected mains power switch



Control Surface (Channels)

CAPITOL IP's control surface provides 8 channel faders and an area dedicated to signal adjustments, programming, monitoring and talkback.

The surface consists in an 8RU panel with normalized 19" width.

The CAPITOL IP control surface comes, as previously mentioned in two versions; either integrated in a desktop chassis with white wooden side-trims, providing the control surface with an ergonomic inclination for the operator or; without desktop chassis, as an 8RU 19" control surface to be flush-mounted or counter-sunk, horizontally integrated with the the studio furniture desktop.

All of CAPITOL IP's signal channels are completely user-definable. System signals can easily be assigned and re-assigned to the channel faders; a particular channel can control any given signal at one moment and a different one in another. This facilitates unique signal to channel distribution, and allows CAPITOL IP to be easily adapted to distinct programming requirements and to suit different operational needs.

CAPITOL IP packs a tremendous amount of power and flexibility into its small footprint. In addition to signals present on the control surface which can be mixed, processed, and sent to any output channel, CAPITOL IP can adjust the level and routing of all its available physical channels, including those that are not "visible", i.e. not assigned to any specific channel.

At the top of each channel section there are 2 routing buttons and 1 channel selection button that is used to assign the channel to the common controls for the advanced configuration parameters: (gain, dynamics, equalization, balance, and send to Auxiliar channels or Telephones).

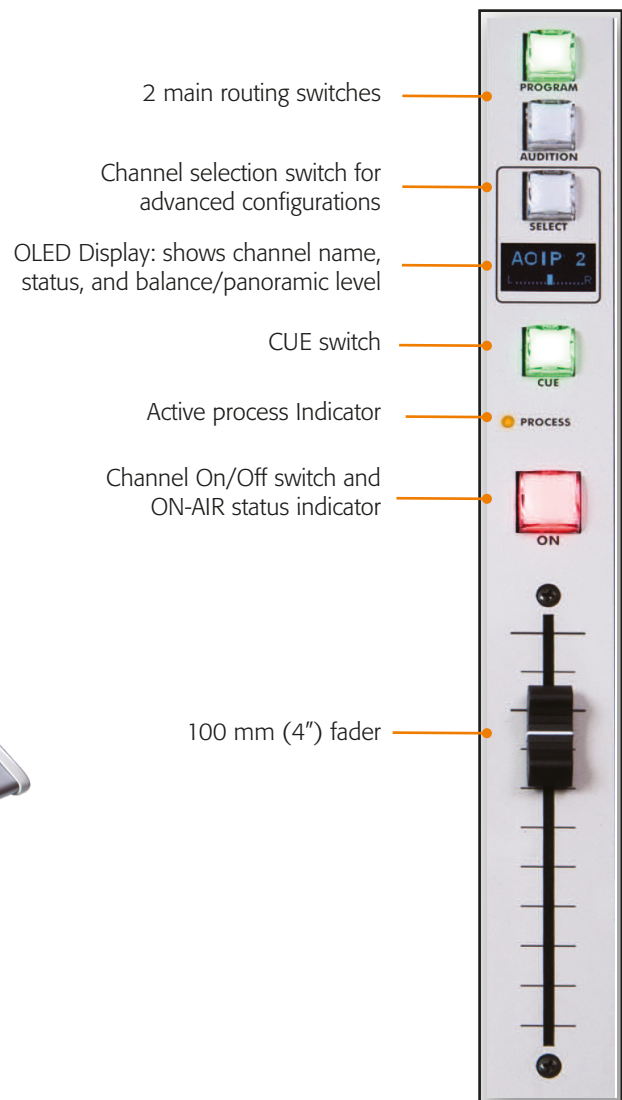
Next is an OLED display screen which shows the channel's name and status as well as the balance level. Beneath, a CUE button along with a LED that indicates activity or applied process, i.e. equalization, filters, dynamics and gain. Finally, the last two elements are the channels on/off button that at the same time serves as the channel ON-AIR status indicator and the 100 mm (4") fader.

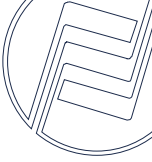


CAPITOL control surface without the desktop chassis mounted, ready to be flush-mounted or mounted in a 19" Rack.



CAPITOL control surface with the desktop chassis.





SETTINGS, PROGRAMMING, MONITORING AND TALK-BACK

ADDITIONAL FUNCTIONALITY

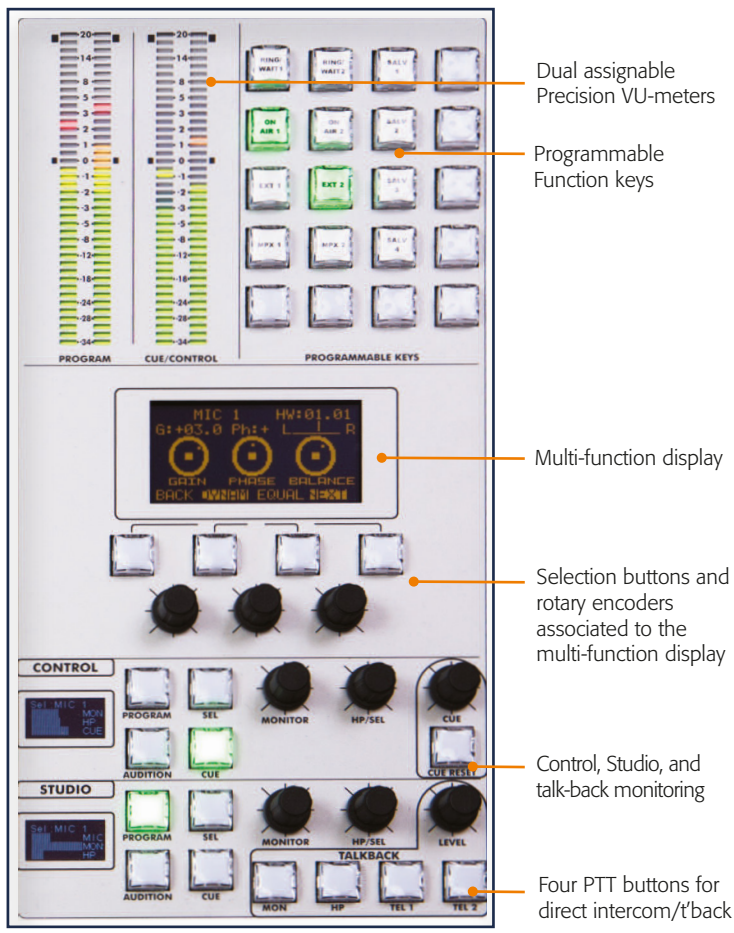
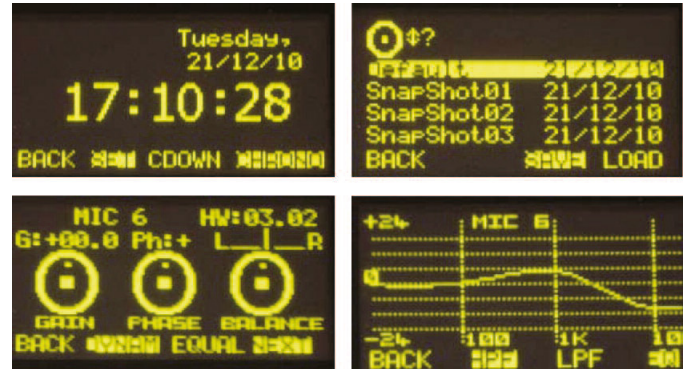
AEQ CAPITOL allows the user to program pre-defined special functions such as: GPI's and GPO's, controls for hybrids and audiocodescs, sending signals to the VU meters, or setting up additional intercom routing.

20 programmable keys are also provided to assign programmed functions and to enable/disable such functions during operations.

ADVANCED CONFIGURATION DISPLAY AND CONTROLS

Each of CAPITOL's fader channels has an advanced settings button. Configuration is carried out by using the multi-function integrated OLED display in the monitor and control section on the right side of the console. The rotary encoders and switches associated with the display are used to scroll through the contextual graphic menus.

General functionality includes adjustment and instantaneous activation of audio effects: equalization, filters, limiters, etc., memory management and configuration, general effects disconnect, timer, stopwatch, phase change, test signal insertion, etc.



MONITORING

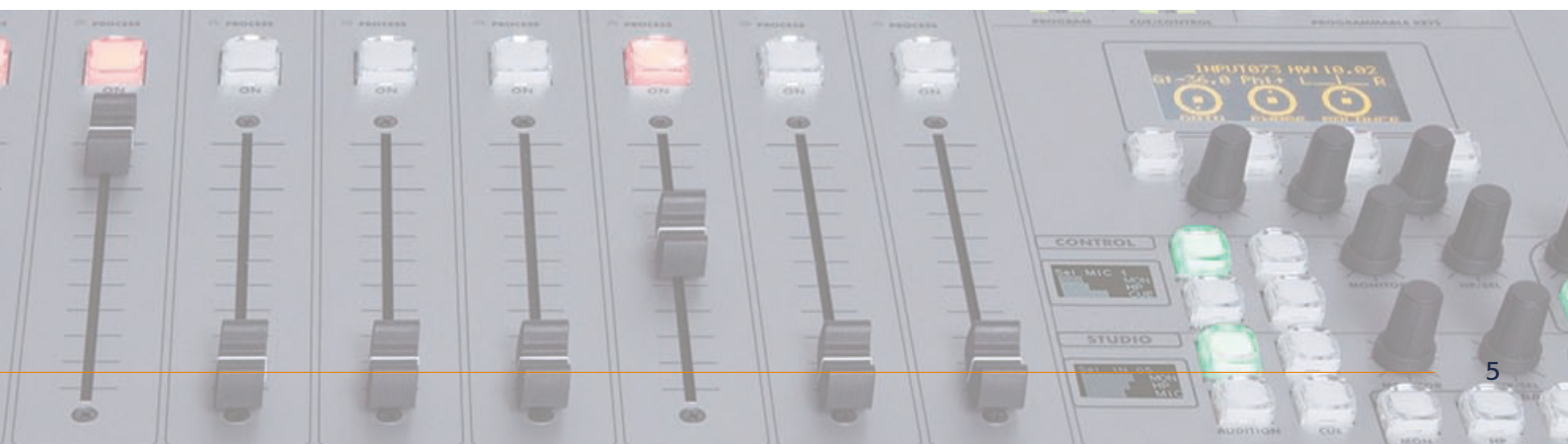
The control surface also has two integrated high precision digital stereo VU meters, each of which can be assigned to display either Master or CUE outputs.

CAPITOL IP has two sections for the independent monitoring of the control room and the studio. There are separate level controls for control room speakers(monitors), studio speakers(monitors), and headphones, as well as CAPITOL IP's additional CUE monitoring output that is available on the CAPITOL IP 2RU engine. The studio and control room monitor sections have an OLED display each where selections can be visualized.

CAPITOL IP also includes independent and centralized control of ONAIR signalling for the signals assigned to speakers and headphones and their levels, cough muting, CUE mute, etc.

TALK-BACK

There are two independent pre-set intercom paths between the console and the studio for speakers and headphones. Additional intercom lines can be established to facilitate management of communication within the system. For example, a talk-back microphone signal can be sent to individual hybrid and audio codec returns.





BASIC COMPONENT

AUDIO ENGINE or CORE UNIT: CA 01

In a 2RU 19" frame all the processing power and the audio I/O connectivity is concentrated. It also houses the GPI's and GPO's, LAN Ethernet and the bus connection for the physical control surface.



CONTROL SURFACE

PHYSICAL CONTROL SURFACE: CA CS

Consists in an 8RU 19" panel that can be mounted in a desktop chassis- CA CS or can be flush mounted in your technical furniture. It holds 8 channel fader controls.



PHYSICAL CONTROL SURFACE: CA TT

Control surface integrated in a desktop chassis with white, wooden side-trims with the name CAPITOL IP.



Both includes 8 channel fader controls with:

- 100 mm (4") Fader.
- Channel On/Off switch and ON-AIR status indicator.
- Active process Indicator.
- CUE switch.
- 2 main routing switches.
- Channel selection switch for advanced configurations.
- OLED Display: shows channel name, status, and balance/panorama level.

An area for settings, programming, monitoring and Talk-back with:

- Dual assignable precision VU-meters.
- 20 Programmable function keys.
- Multi-function display.
- Selection buttons and rotary encoders associated to the Multi-function display.
- Control room, studio, and talk-back monitoring.
- 4 PTT buttons for direct intercom with Studio or external lines.

OPTIONS

VIRTUAL CAPITOL: CA IP VI – Virtual control surface

VIRTUAL CAPITOL IP is a Windows and iOS compatible application. The application faithfully reproduces every detail of the control surface and all the operational features of switches, rotary encoders and faders.

The complete functionality of the physical control surface CA CH available on a SW application and can run in parallel with or substitute the control surface, temporarily or permanently, locally or remotely. With this APP installed on your iPad, you can remotely assist or relieve the operator of the console or make eventual adjustments when the operation is unmanned during, for example, weekends.



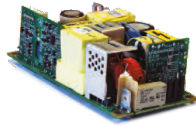
SOFTWARE MONITORING APPLICATION CAPITOL SCREEN: CA IP SC

This PC Windows and IOS compatible application multiplies in quantity and size the different meters and indicators for monitoring that the control surface of the mixer incorporates. Indicative levels corresponding to the Vu-/peak-meters for the most important signals on the console are transmitted through TCP/IP. Further, indications with regards to the routing of the different signals to the phone and mix-minus buses, the status of each phone line, system date and time plus ON-AIR signalling are also part of the informative monitoring available through this application. It is also possible to configure all the parameters that are available on the AEQ CAPITOL IP such as equalizers, high-, low- and band-pass filters, compressors/limiters, noise gates...this is the most complete monitoring and control tool available for your AEQ CAPITOL IP digital console!

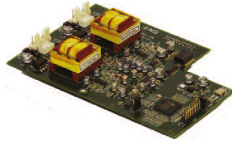


REDUNDANT POWER SUPPLY: CA PS

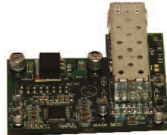
Optional redundant power supply module, auto-range 100-240 V. 50/60Hz. Easily installed in the audio engine or "Core Unit".

**DUAL LINE DIGITAL TELEPHONE HYBRID MODULE: CA 33**

Internal board with dual line digital telephone hybrids. Electrical echo cancellation by DSP. Easily installed in the audio engine or "Core Unit".

**MADI MODULE: CA 11**

Handles up to 64 audio channels in each direction allowing CAPITOL IP to communicate with another console or a router up to 2000 meters away using a simple pair of fiber-optic links.

**IP MODULO: CA 14**

Audinate/DANTE™ multi-channel IP Audio networking connectivity. Handles up to 16 bidirectional audio channels allowing CAPITOL IP to communicate with other AoIP networked console devices. The audio engine or "Core Unit" is fitted from factory with the necessary external Ethernet connectors.

CABLES

Our pre-fabricated data and audio cables allow quick and easy connection of the CAPITOL IP console. The cables come with DB type connectors on the console side and open-end on the other.

- FR CAB GPIO: Male DB15 connector installed on a balanced and shielded 6 meter open-end cable, for Opto-coupled GPI/O's and the relay fitted GPO.
- FR CAB INP: Male DB15 connector installed on a four pair, balanced and shielded 6 meter open-end cable, for 4 inputs or outputs.

CAPITOL IP DIGITAL MIXING CONSOLE SPECIFICATIONS**Functionality**

- IP networked Digital Audio Mixing Console.
- Cough mute, studio and control room ON-AIR signalling, fader-start, remote PFL, talk-back, automatic speaker mute.
- N-1 output configuration.
- Integrated external equipment control (AEQ hybrids and codecs) via programmable key section.
- Optional pre-fader / post-fader for all routing.
- Control communication via 10/100 Ethernet connection using TCP/IP protocol.
- Selectable boot-up – using last used settings or default settings.
- System signals can be assigned to any control channel.
- System settings are stored in the on-board memory: 1 default basic factory configuration and 6 user defined configurations.

General Features

- All system signals configurable for monitoring in Control, Studio, CUE Headphones and VU-meters.
- 2 direct-routing buttons on each channel.
- Silent operation by convection cooling. CAPITOL IP is ideally suited for self-operated applications.
- Talk-back function can be assigned to any Microphone- 4 PTT buttons for direct intercom.
- Built-in headphone outputs.
- 2 precision stereo VU meters.
- Test tone generator.
- Clock, timer and stopwatch.
- Phase meter.
- Redundant power supply (optional).
- Phantom power and electronic balancing on microphone inputs.
- Electronically balanced analog line inputs and outputs.
- Transformer balanced digital inputs and outputs.
- Sampling rate converters for the digital inputs.
- Optional redundant power supply.

Standard Inputs and Outputs

- 4 mic./line mono inputs, configurable with phantom power.
- 2 USB (I/O) digital stereo inputs/outputs.
- 4 AES/EBU digital stereo inputs/4 AES/EBU digital stereo outputs that can be configured as SPDIF.
- 12 analog inputs/8 analog outputs (can be configured as individual stereo pairs).
- Analog stereo outputs for Control, Studio, CUE and Studio primary Headphone monitoring.

- Analog stereo outputs for amplified Control Headphones, jack 1/4"
- 8 opto-coupled GPI's, 8 opto-coupled GPO's and 4 GPO's with relays.

Optional Inputs and Outputs

- Dual line Digital Telephone Hybrid with two RJ-11 Line connectors and two RJ-11 connectors for Telephone SET.
- Two Ethernet connectors for Audinate/DANTE™ Technology AoIP networking connectivity, providing 16 bi-directional audio channels.
- Bi-directional MADI fiber-optic interface handling up to 64 digital inputs and outputs.

System Processing Capacity

- 48 kHz, 24 bit internal sampling frequency.
- ± 12 dB gain control (analog and digital signals – including signals not visible on control surface).
- Gain control - microphone inputs: from 19 to 74dB.
- Selectable balance/panoramic control on all channels.
- Selective phase reverse.
- Audio processing for 16 stereo signals (up to 8 in fader and 8 signals not visible on control surface).
- Pre-defined audio processing that allows manual adjustment.
- Available audio effects: 3 band equalizer, high pass and low pass filters, compressor/limiter, and noise gate.

Dimensions and weights**AUDIO ENGINE or CORE UNIT: CA 01**

- Weight: 5,2 - 6 Kg (11.5 - 13.2 lbs) depending on options.
- Width: 482 mm (19 ") Height: 2 RU. 89 mm. (3 1/2 ").
- Depth: 330 mm (13 ").

CONTROL SURFACE: CA CS

- Weight: 4 Kg (9 lbs).
- Front: Width 482 mm (19 ") Height 8RU. 355 mm. (14 ").
- Depth: 40 mm (1.58 ").
- Cut-out for counter sinking.
- Width: 445 mm (17,52 ") Height: 335 mm. (13,20 ").

CONTROL SURFACE : CA TT

- Weight: 6,3 Kg (14 lbs).
- Width: 560 mm (22.04 "). Height 455 mm. (17,92 ").
- Depth: 75 mm (2.95 ").



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