



# ARTEMIS

Shine Beam Light





Calrec's expertise, experience and technology is trusted and endorsed by the world's most successful broadcasters.

## The Calrec heritage

Since the launch of our first audio console in 1971, Calrec Audio has been dedicated to the design and manufacture of broadcast audio mixing consoles, and to keeping one step ahead of the changing needs of the broadcast environment.

All Calrec products are designed, manufactured and tested at our Nutclough Mill headquarters in Hebden Bridge, West Yorkshire, England. From original concept through R&D to state-of-the-art production, every step of the manufacturing process and every element of development is carried out in-house, which guarantees a quality standard unsurpassed in the broadcast console marketplace.

**Throughout the decades Calrec has earned an outstanding reputation for innovation and has a well documented history of technological world firsts:**

**1977** Calrec supply the world's first stereo broadcast console.

**1981** Calrec supplies the world's first digitally controlled assignable mixing console.

**2007** Calrec launches Bluefin, an FPGA-based high-density DSP card, which permits real-time 5.1 surround mixing and processing another world first for Calrec.

**2009** Calrec unveils Bluefin2, a significant step up from Calrec's pioneering work with FPGAs for real-time audio DSP processing.

Calrec's expertise, experience and technology is trusted and endorsed by the world's most successful broadcasters.



**High-definition broadcast is here to stay, and 3D is just around the corner for many networks.**

Multi-channel audio, with its voracious demands on mixer channel counts and audio infrastructure, is a reality that everyone has to face. With Calrec's Artemis, you can embrace a future in 5.1 with capacity to spare.

The global transition to HD has proven revolutionary – perhaps the most radical change in the broadcasting arena since the move from black-and-white TV to color. Broadcasters worldwide are undertaking a comprehensive overhaul of their equipment and behind-the-scenes infrastructure, at all levels of production, from capture and editing to playout.



ARTEMIS

## SD, HD, 3D: the changing face of broadcast

In sound, high-resolution 5.1 is emerging as the standard for HD and 3D audio, requiring a complete technical renewal to produce true surround for broadcast. At every level of the audio production chain, where there were previously two audio channels, six are now necessary for true 5.1. Neither broadcasters nor broadcast equipment manufacturers can afford to fall behind.

Throughout Calrec's 50-year history, its team of innovators have anticipated such major changes and consistently provided superior products which have allowed forward-thinking broadcasters to remain a step ahead.

Calrec introduced the world's first true stereo broadcast console and the first point-source surround microphone in the 1970s, anticipating the growth of multi-channel broadcast audio.

When Calrec produced the world's first digitally controlled analog broadcast console in the early 1980s, the company predicted the shift from discrete-circuit mixing consoles and the separation of control surfaces from networked processing hardware.

In 2007 Calrec produced Bluefin, the first DSP processing engine based on FPGA (Field Programmable Gate Array) technology, which enabled broadcast consoles to work efficiently with true discrete-channel 5.1 surround for the first time.

Today, broadcasters need more and more digital audio channels at ever-higher resolutions. They need more and more processing power to handle the increasing channel count and more assignable, more ergonomic control surfaces to deal with the increased workload that HD broadcasting demands.

Naturally, Calrec already has the answer to all of these concerns, in the form of their latest family of assignable digital broadcast consoles. At the head of the family is the flagship Apollo console, offering the ultimate in power, flexibility and control. Delivering excellent return on investment, the next additions to the range are the Artemis series of consoles.

**Artemis delivers excellent return on investment.**





# Artemis specifications & benefits

Powerful, responsive, flexible, beautiful, and reliable as only a Calrec can be, the Artemis continues in the innovative tradition established by the Apollo console.



Artemis

| Channel Facilities                             | Artemis Shine   | Artemis Beam                         | Artemis Light                        |
|--|---|--------------------------------------|--------------------------------------|
| Channel Processing Paths                       | 680   | 340                                  | 240                                  |
| Main Outputs                                   | Up to 16 from M/G pool of 128   | Up to 16 from M/G pool of 128        | Up to 16 from M/G pool of 72         |
| Groups   | Up to 48 from M/G pool of 128   | Up to 48 from M/G pool of 128        | Up to 48 from M/G pool of 72         |
| Track Busses                                   | Up to 64  | Up to 64                             | Up to 48                             |
| Aux Busses                                     | Up to 32  | Up to 32                             | Up to 24                             |
| AFL Systems                                    | 3   | 3                                    | 3                                    |
| PFL Systems                                    | 3   | 3                                    | 3                                    |
| Inserts (Channels, Groups and Mains)           | 1 per path from pool of 256   | 1 per path from pool of 256          | 1 per path from pool of 128          |
| Direct/Mix Minus Outputs (Channels and Groups) | Up to 4 per path from pool of 512   | Up to 4 per path from pool of 512    | Up to 4 per path from pool of 256    |
| Input Delay                                    | 256 legs of 2.73s   | 128 legs of 2.73s                    | 128 legs of 2.73s                    |
| Output Delay                                   | 256 legs of 2.73s   | 128 legs of 2.73s                    | 128 legs of 2.73s                    |
| Channel Delay                                  | 2.73s per channel   | 2.73s per channel                    | 2.73s per channel                    |
| Buss Path Delay                                | 2.73s per path  | 2.73s per path                       | 2.73s per path                       |
| Track Sends per Channel or Group               | 4   | 4                                    | 4                                    |
| EQ 1-4   | 4 band parametric   | 4 band parametric                    | 4 band parametric                    |
| EQ 5-6   | 2 band parametric   | 2 band parametric                    | 2 band parametric                    |
| Sidechain EQ                                   | 2 band parametric   | 2 band parametric                    | 2 band parametric                    |
| Dynamics 1                                     | Compressor/Limiter and Expander/Gate  | Compressor/Limiter and Expander/Gate | Compressor/Limiter and Expander/Gate |
| Dynamics 2                                     | Compressor/Limiter  | Compressor/Limiter                   | Compressor/Limiter                   |
| Max Faders                                     | 64  | 64                                   | 56                                   |
| Layers   | 12 dual layers  | 12 dual layers                       | 12 dual layers                       |
| Automixers                                     | 8   | 8                                    | 8                                    |
| Router Ports                                   | 16/32   | 16/32                                | 8                                    |
| Networking                                     | Integral 8192 <sup>2</sup> router<br>All I/O provided over Hydra2 network via a range of Hydra2 I/O boxes<br>Cat5e or fiber connectivity  |                                      |                                      |
| Resilience                                     | Highly resilient – all modules are hot-pluggable with automatic redundant PSU, DSP, Control processor, Router module, I/O Expansion module<br>Independent DSP operation ensures audio continuity in the event of a PC or control reset<br>Low power consumption and heat generation |                                      |                                      |



## Sheer power

### Super-high-density processing for HD broadcast.

#### Bluefin 2

Bluefin High Density Processing Technology (HDSP) changed the way broadcasters regarded DSP. A truly revolutionary technology, it provided vastly superior levels of signal processing in a fraction of the space of conventional systems.

Bluefin was the world's first implementation of Field Programmable Gate Array (FPGA) technology for full DSP processing, providing enough processing on one DSP card to power an entire mixing console running surround-sound productions.

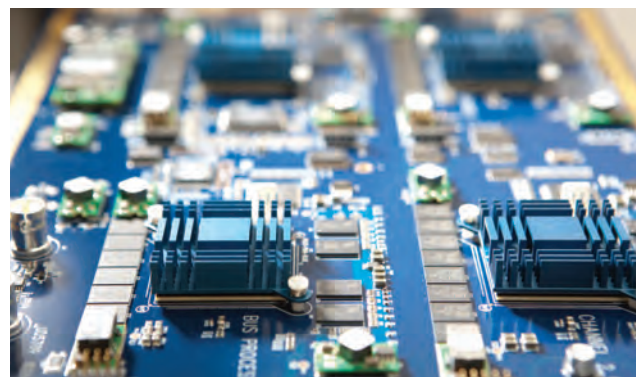
Bluefin2 is the next generation of Calrec's FPGA technology, the DSP powerhouse for the next generation of Calrec consoles, and it provides enough processing muscle to cope with the biggest, boldest 5.1 projects. It gave the Apollo console more than twice the processing power of previous Calrec desks, and affords the Artemis Shine and Beam their impressive tallies of 680 and 340 channel processing paths respectively.

Thanks to Bluefin2, each Artemis channel has access to its own dedicated six-band parametric EQ, dynamics and delay processor, with a total delay of over 60 minutes in the case of the Artemis Shine, and more than half an hour on the Artemis Beam. Artemis can address up to 16 main outputs, 48 group outputs, 64 IFB/Track outputs and 32 auxiliary outputs.

Bluefin2 also gives Artemis enough DSP power for two dynamics processors per channel if required, without any reduction in channel count.

As you would expect from Calrec, all these features are available irrespective of the processing load on other channels, as channel resources are not shared across the console. And of course, system resilience is always reinforced with a second Bluefin2 card in each Artemis rack – it's like having another console as a hot spare.

Whatever the developing requirements of HD broadcast, Calrec's Bluefin2 processing engine will keep you on the air and sounding great.



Thanks to Bluefin2, each Artemis channel has access to its own dedicated six-band parametric EQ, dynamics and delay processor.



## The beating heart

If Bluefin provides the processing power and Hydra is the backbone, the heart and nerve center of the Artemis is its control rack. And given that it houses all of the console's processing, power and routing capabilities, this 8U rack - 4U on the Artemis Light - is amazingly compact and energy efficient.

Its reduced size, low power consumption and reduced heat generation make it ideally suited to operation in environments where rack space is at a premium, as in remote broadcast vehicles.

The Artemis rack consists of secondary redundant power supplies, DSP, router, router expansion and processing cards as standard.

As one would expect with Calrec digital consoles, these cards auto-takeover within milliseconds in the unlikely event of a component failure, ensuring that the flow of audio is uninterrupted during live transmissions. And of course, all cards are hot-swappable.

This is also where Artemis accesses Calrec's Hydra2 network, which provides audio and control signals via the rack's 8192<sup>2</sup> router card. Small-format pluggable mini-GBIC connectors allow users to choose the nature of the cabling to suit their operational requirements, with options for both fiber-optics or copper connections.

I/O connections are made via stand-alone and modular Calrec interface boxes in a variety of sizes and in all industry-standard audio formats, including analog, AES3, MADI and SDI.

If Bluefin provides the processing power and Hydra is the backbone, the heart and nerve center of the Artemis is its rack.



# Making connections

Like Bluefin, Calrec's Hydra networking technology is now capable of even more.

## Hydra2 – Making connections

In 1981 Calrec created the world's first digitally controlled assignable mixing console, predicting the future of console design by separating a mixing control surface from its processing hardware. Calrec's Hydra2 technology is the latest expression of this concept.

The flexible link between Artemis's control surface and its 8192<sup>2</sup> router, Hydra2 permits the construction of large-scale distributed mixing networks with multiple control surfaces and router/processors, with true 'one-to-many' routing, and about half the connection latency of the original Hydra network.

An Artemis control surface is just one of many possible clients on a Hydra2 network. Several Artemis (or Apollo) control surfaces in a multi-studio broadcast facility can be seamlessly linked via Hydra2 for large-scale productions or live broadcasts, and separated again after completion of the project. A growing range of fixed-format and modular multi-format I/O boxes provides the physical connections at either end of the network.

Controlling the network couldn't be simpler. All on-line resources are made available to all consoles (unless intentionally isolated for security) no matter where they are physically connected to the network. Input and output ports may be patched at any time, either manually, or en masse, as part of a snapshot memory load.

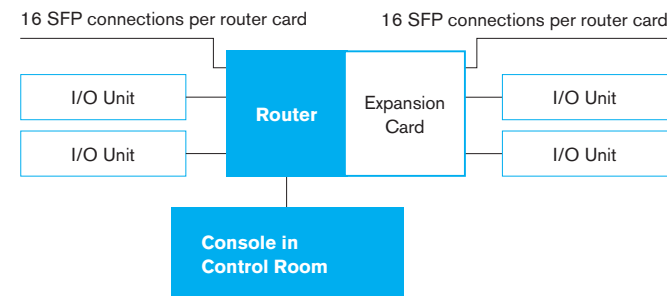
Offering up to 512 bi-directional channels of I/O per copper or fiber-optic connection, Hydra2 is the ultimate point-to-point protocol, allowing large numbers of audio inputs and outputs to be easily shared and controlled.

Complex network topologies may be designed simply and quickly to meet the specific requirements of broadcast facilities, cutting installation costs and ensuring future flexibility.

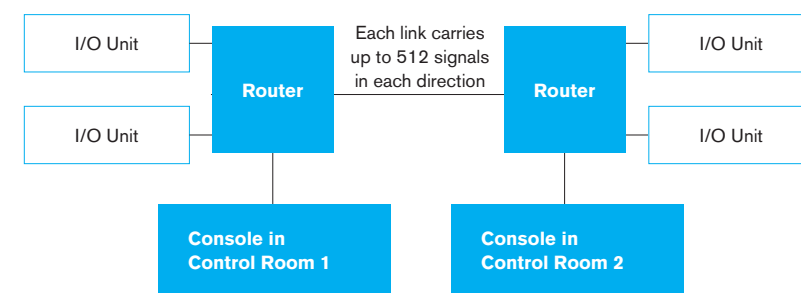
With user-friendly control software that transparently organises all routing, Hydra2 gives you the flexibility you need to build adaptable networks that can be tailored to suit the challenges of HD broadcast.



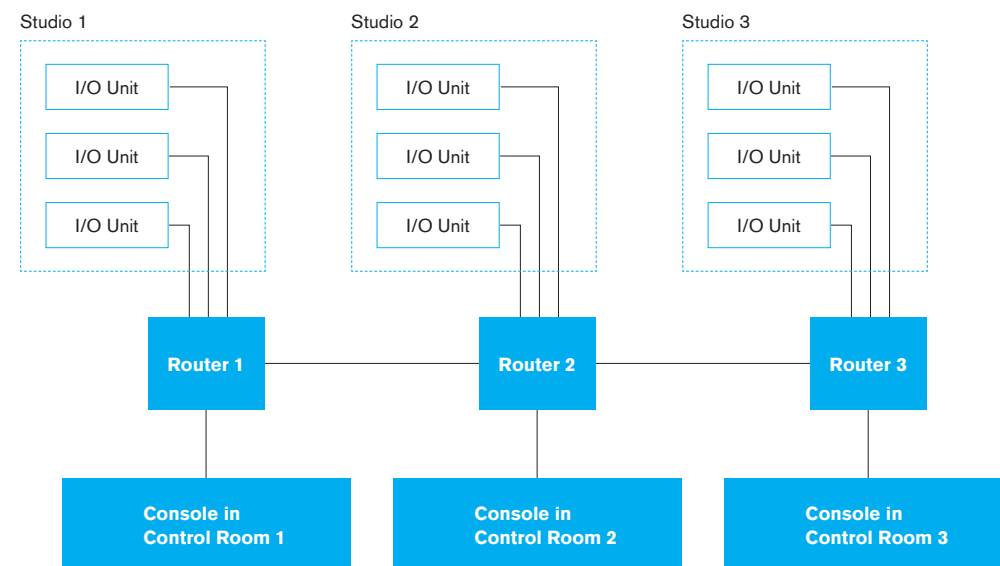
## I/O Connections



## Console to Console Connections



## Multi-control room, multi-studio layout with complete transparent management of all resources across the network.



In this example, any console on the network can access any input – multiple consoles can even access channels from the same studio. This illustration shows the potential expansion capacity of the Hydra2 network. There are no limits to the number of additional I/O boxes and/or additional consoles which can be quickly and seamlessly integrated. Over Hydra2, any client can be added to the network – even remote trucks can be accommodated via a single copper or fiber connection.



## In control

**Benefitting from Calrec's three decades of experience in designing assignable control surfaces, the Artemis control surface is tremendously powerful, functional and beautiful at the same time.**

### The color of audio

Assignability is what gives a modern control surface its flexibility and power, allowing a console with relatively few physical controls to drive a much greater number of channels, tracks, busses and other outputs. Since the advent of assignable consoles, designers have been able to adapt workflows and introduce new control possibilities beyond the limits of analog technology.

However, live broadcast consoles must also be intuitive, easy to drive and have a fast learning curve – it's imperative

that users can understand at all times how their physical controls are assigned. Added to this, the advent of 5.1 audio requires consoles with fewer physical faders to be used to control a much greater number of channels, tracks, or other outputs.

Artemis, like its big brother, the Calrec Apollo console, has the full benefit of Calrec's many years of user interface design. The Calrec assignable control surface is now in its sixth generation, and features color as an important element in its design, with inviting displays and elegant touchscreens, as well as light-emitting panels incorporated into the controls themselves.

Color-coding is used across Apollo's control surface to provide instant, unambiguous visual feedback about control assignments. Fader scales adjacent to the fader change

color to provide feedback to show when mono, stereo or surround channels are assigned. These fader scales also provide alternate color indication when the faders are assigned to control groups or mains.

The function of buttons and rotary controls is also immediately obvious. Organic LED displays (OLEDs) next to each hardware control are clearly labelled with the currently assigned function and update when the assigned function changes. Multi-colored indicators in the rotary controls also indicate function, with a spectrum of control parameters available.

Not only is the result practically elegant, offering users the same sense of assurance associated with one knob-per-function control surfaces, it's also visually striking. Form and function, seamlessly matched.





The most effective way to convey the simplicity of the Artemis control surface is to let a picture do the talking.

More detail can be found below, which explains the numbered sections marked on the control surface. For more on the architecture of this beautiful user interface and its control modes, see pages 13 and 14.

#### 1. Inp/EQ-Dyn Panel

This panel layout contains controls relevant to Input, EQ, and Dynamics processing for the currently assigned path.

#### 2. Send-Routes Panel

This contains controls for routing the currently assigned path to auxes, tracks, groups, mains, direct outputs and mix minus busses. Also provides pan controls and allows interrogation and reverse routing of busses.



All individual settings can be saved to a USB stick.

#### 3. Monitor Panel

Monitor Mode provides additional functionality to the dedicated monitor panel. This could include the configuration of monitor pre-selectors or the setup of talkback groups. It also allows multiple operators access to their own set of monitoring controls.

#### 4. Output Panel

Outputs Mode provides controls for manipulating output paths such as mains, tracks, auxes and groups. Control cells provide functionality, while the TFT screen provides comprehensive metering information.

#### 5. Wilds Panel

Wilds Mode arranges the panels into vertical strips, providing quick access to wild controls for each fader.



From Cells to Panels to User Layouts, Artemis's user interface – the most flexible and user-friendly broadcast console control surface available in the world – is logically structured, flexible and user-reconfigurable.



#### Mission control – Artemis's user interface

Artemis is made up of intuitive touchscreens and repeated tactile elements, it is best understood by first considering its smallest element, the Cell, as everything is built logically on this basic concept.

Each Control Cell is made up of two colored rotary controls and two colored buttons arranged in a square, together with a compact OLED display directly above which indicates how the rotary controls and buttons are assigned. The use of touch technology encourages users to interact with the control surface directly and adapt the Cells to specific set-ups. OLED technology and color-changing rotary controls give the user instantaneous feedback as to the panel setting.

The Cells are arranged in two rows of Wild controls per fader path, with additional control options above the faders.

As on Calrec's Apollo console, each Artemis fader has two audio paths, and there are also 12 A/B Layers, making for 24 possible assignments to each control or fader. The assignable nature of the interface allows users to configure controls wherever they want them and even change them on the fly.

In Assign Mode, the Wild/Assign panels replicate a classic Calrec assignable console, as used in over 60% of HD trucks in the USA alone. Individual panels take on the roles of EQ/Dyn, Routing, Output and Monitor panels and are assigned to display whatever parameters are most relevant to the currently selected fader and path. In Wilds Mode, each vertical channel strip is assigned to represent a single channel, with controls down its vertical length.

Once users have grasped how Cells work, mastering the rest of the interface is child's play, as it is built logically from the Cell upwards.

To simplify operation, Calrec offers three default User Layouts. The first is an 'Assign' Layout, where panels are assigned as EQ/Dyn, Routing, Output and Monitor panels. A second Mode is a 'Wilds' Layout, where all of the control panels are in Wilds Mode and the console can be driven like a traditional analog console. A third, 'Combined' layout option arranges Assign and Wilds panels across the console, giving the operator the best of both approaches. This layout can be invaluable to operators working on live broadcasts, where immediate access to controls and channel information is paramount; it allows more controls to be used simultaneously to access features like routing, dynamics and EQ via the Assign panels, but without sacrificing the singular detail of more traditional channel strip control.

Operators even have the option of creating unique User Layouts, customizing the console to suit a facility's exact requirements. Dedicated user-controllable facilities are also available to split the mixing control surface into independent sections, each with fully independent APFL. This can be useful on larger broadcast productions, where multiple operators may be seated at the console.





## 5.1 management

**Like its predecessor the Apollo console, Artemis has been designed from the ground up with surround sound in mind. Artemis offers plenty of processing, monitoring and mixing options for true 5.1 operation.**

### Working in 5.1

The switch to a multi-channel surround environment demands more from mixing consoles, not just in terms of processing but also that they provide an elegant and intuitive way of manipulating those surround signals.

Calrec's surround channels give operators the ability to control a complete six-channel surround buss on a single fader and have processing applied to it just like a mono or stereo source. Convenient, quick and simple.

However, if individual control is required over the constituent channels of the surround signal, that's also

possible. Surround channels can be 'spilled out' into their component channels (L/R, Ls/Rs, Center and LFE) for individual adjustment, where control is managed on four faders of a dedicated Spill panel. Processing may then be controlled on each leg of the surround mix individually.

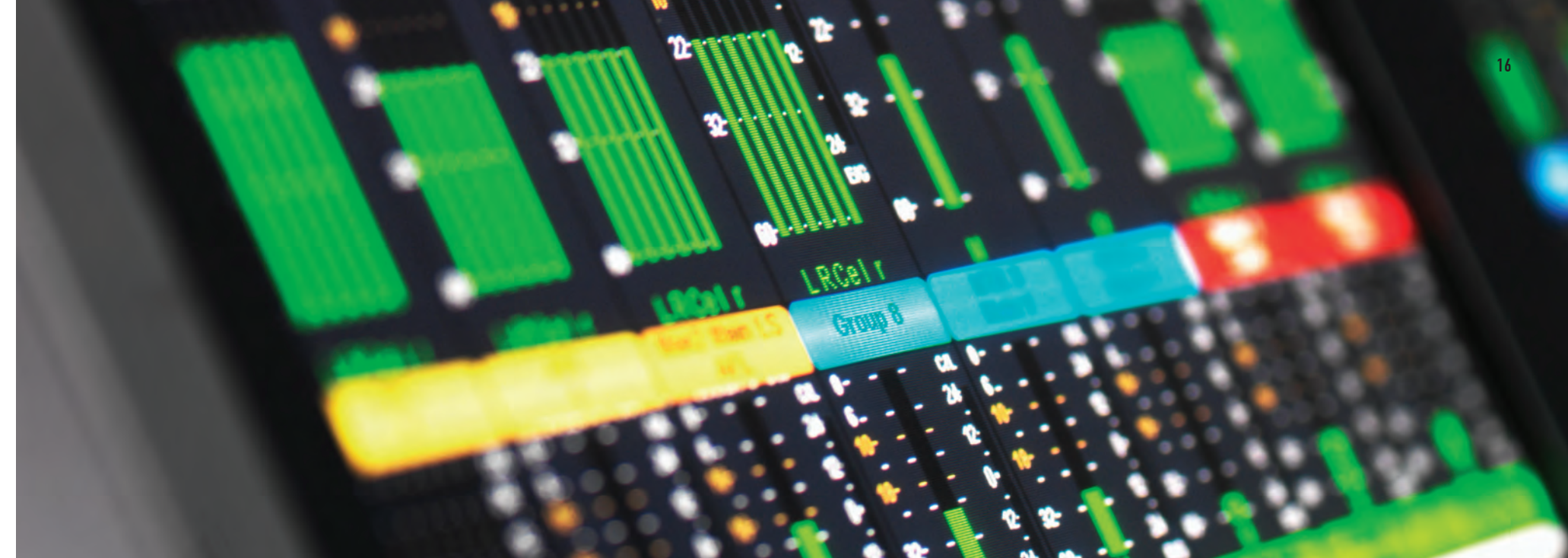
Surround panning can be achieved using the Spill faders to effect level changes, or an optional additional Spill panel is available with a surround joystick.

In addition, surround production is not limited by processing power – Artemis provides up to 16 x 5.1 main outputs and 48 x 5.1 groups, with full control of the stereo downmix of the surround main outputs. This is important when handling simultaneous HD and SD transmissions.

However you prefer to work in surround, Calrec makes it possible.



Artemis offers plenty of processing, monitoring and mixing options for true 5.1 operation.



## On the level

**With per-channel bargraph meters next to each fader and multi-channel metering via an array of TFTs, Artemis offers no shortage of ways to monitor signal levels.**

### Metering

Clear and efficient metering allows an operator to concentrate on the job in hand – producing a mix which pins the viewer to their chair.

Calrec's TFT metering does all this and more. As well as providing a greater density of signals to be metered, Calrec's system also provides full operator configurability over layout, size and color without increasing cost.

Surround signals can be metered in the same space as mono and stereo signals, and each TFT on Artemis can be configured to display  $\frac{1}{3}$ ,  $\frac{1}{2}$ ,  $\frac{2}{3}$  and full height meters. A variety of signals can be metered such as main outputs, groups, auxes, track outputs, external inputs, AFL/PFL, meter selectors, CRLS and mix-minus.

Channel metering is also displayed whether the source is in mono, stereo or surround and an extra gain-reduction meter may be displayed next to each level meter if dynamics processing is assigned to that channel. If you prefer to keep your eyes on your faders as you mix, a bargraph meter is built in next to every channel fader.

Recognizing that some users prefer to rely on third-party meters, Artemis can drive metering from its outputs just like monitor speakers. There's also an empty option bay on the console's upstand which is physically compatible with industry-standard phase meters and vectorscope displays from third-party manufacturers.

In short, however you like to meter your input and output signals, Artemis offers you a wealth of options.



## Multiple operators



**Artemis's User Split function allows up to three users to share its control surface, each user with their own independent layout, assignment options and APFL buss.**

### Control surface splits

Complex live broadcasts, such as live concerts or large LE shows with multiple participants, often call for more than one mixing console operator, particularly when working in 5.1. With Artemis's User Split options, one control surface can be quickly and easily split to accommodate up to three users working independently.

Each user section behaves like an independent control surface, with individual channel processing, monitoring and APFL facilities, panel mode settings and path assignment controls. Split points can be set up along the left-hand edge of any panel and redefined quickly and easily on the fly. Additional consoles can also be introduced to work as 'sidecars' to the main console if required.

## Interested third parties



**With complex modern working practices, it is increasingly important to simplify workflow procedures and reduce costs.**

Calrec have a long history of allowing control of their consoles by equipment from third-party manufacturers. The first such agreement for the Apollo platform, allowing its integration with and control from Riedel's Artist intercom system, was announced shortly after the platform's launch.

### Third-party Integration

Following the introduction of Artemis, software interfaces have been announced that allow control of the console from the broadcast industry's most popular automated production systems, including those provided by Grass Valley, Sony, Ross, and Snell.

Further software integration enables router control of the Calrec Hydra2 network, streamlining production by eliminating the need for a separate audio routing device in many situations.

Calrec remains at the forefront of providing integration with third-party suppliers, thereby helping broadcasters to improve their infrastructures and save money.

Simply put, things work better when we all talk to each other.

**Calrec remains at the forefront of providing integration with third-party suppliers.**



## Questions, questions

### REDUNDANCY

#### What if there is a hardware failure? What does Calrec mean by redundancy?

An audio console for live on-air use has to be extremely reliable. Calrec consoles have an excellent reputation in this area, but as with all hardware, there is always a potential for failure. That's why Calrec don't take any chances; on-line redundant hardware is provided for ALL critical systems as standard, and takeover is automatic and seamless. These elements are hot-pluggable for easy replacement.

Many so-called redundant systems only protect part of the system and may require the system to be closed down before a reboot is possible. Calrec's hot spares constantly mirror what the on-line component is doing.

In the rare event of a hardware failure, the spare automatically takes over with no disruption to the audio.

On replacement the new hardware becomes the redundant spare and mirrors the primary module as before. This intelligent system covers DSP modules, Control Processor modules, Router modules, I/O Expansion modules and all PSUs. It even runs to all connections which can be either copper or fiber. With Calrec, you can be confident that you are always in control.

### CHANNELS

#### Why has Calrec provided so many channels?

HD and 3D broadcasting already uses 5.1 surround as a standard delivery format, and with the large channel counts this entails, processing capacity can be an issue on smaller, less well-equipped consoles. Artemis has the ability to process up to 680 simultaneous channels with no pooling of resources – all busses are available at all times on all channels.

### LAYERS

#### Artemis has a total of 24 layers across the console... why so many?

One of the major benefits of digital consoles is their ability to manage incoming signals. As paths are assigned to faders remotely, a user can arrange the same paths to different layers and in different arrangements.

For example, on a large Light Entertainment set up an operator may assign the inputs from a live band on one layer and the same inputs on a second layer, but with the controls closer to hand and with less critical channels off to one side. These settings can be saved to USB before the event, or even offline via Calrec's Offline Editor and recalled at the touch of a button. Layers also allow access to more channels with less hardware.

With Calrec, you can be confident that you are always in control.

Artemis offers three independent APFL and monitoring systems, so one processing rack can provide management to three control surfaces, connected quickly and simply to the Hydra2 network via Cat5e or fiber cable. Layers give an operator the ability to access many more channels on this compact frame.



### SPACE

#### How well suited is the Artemis for Remote Operation? I have very limited space.

With a fader pitch of just 30mm, Calrec consoles have a higher fader density than other consoles – in fact, Calrec can squeeze in more physical faders into a space than any other manufacturer. Not only that, but rack space is kept to a minimum thanks to Bluefin2 and Hydra2 technology. All the processing, routing and power supplies – including redundant spares – are packed into an incredibly compact rack.

Not only does this reduce space but also weighs less, generates less heat and is more resilient. Calrec designs all its consoles with this in mind, which is why Calrec is a clear leader among companies providing audio mixers for broadcast trucks.

Calrec consoles have a higher fader density than other consoles – in fact, Calrec can squeeze in more physical faders into a space than any other manufacturer.



NB. All I/O on the Artemis console is determined by Hydra2 I/O boxes and performances may differ depending on the type of I/O box on the network.

## System specification

### AES3 Inputs

|                        |   |
|------------------------|---|
| Formats Supported      | AES/EBU (AES3) 24-bit<br>Also suitable for use with SPDIF (IEC958 Type 2) signals         |
| Interface              | 110 Ohm transformer balanced, 0.2V-7.0V Pk-Pk<br>75 Ohm unbalanced (BNC), 0.3V-1.2V Pk-Pk |
| Sample Rate Conversion | 24-Bit switchable on all AES inputs   |
| SRC THD+N              | -117dB @ 1kHz, 0.00014%   |

### AES3 Outputs

|                   |  |
|-------------------|--|
| Formats Supported | AES/EBU (AES3) 24-bit  |
| Interface         | 110 Ohm transformer balanced 3.5V Pk-Pk (nominal) into 110 Ohm load<br>75 Ohm unbalanced 1V Pk-Pk (nominal) into 75 Ohm load (BNC) |

### Analog Inputs

|                             |  |
|-----------------------------|--|
| Analog – Digital Conversion | 24-Bit   |
| Input                       | Electronically Balanced  |
| Input Impedance             | 2k Ohms for Mic gains<br>10k Ohms for Line gains   |
| Sensitivity                 | +18 / -78dB on Mic/Line Inputs   |
| Equivalent Input Noise      | -127dB (150 Ohm source)  |
| Distortion                  | -1dBFS @ 1kHz – Better than 0.003%<br>-20dBFS @ 1kHz – Better than 0.006%<br>-60dBFS @ 1kHz – Better than 0.3% |

|                                   |  |
|-----------------------------------|--|
| Frequency Response                | 20Hz to 20kHz +/- 0.5dB on Mic/Line Inputs |
| Input CMR (Common Mode Rejection) | >75 dB (Typical 85dB) on Mic/Line Inputs   |

### Analog Outputs

|                             |  |
|-----------------------------|--|
| Digital – Analog Conversion | 24-Bit   |
| Output Balance              | Electronically Balanced, 20Hz to 20kHz, Better than -35dB, typically -45dB                                     |
| Output Impedance            | <40 Ohms   |
| Distortion                  | -1dBFS @ 1kHz – Better than 0.006%<br>-20dBFS @ 1kHz – Better than 0.003%<br>-60dBFS @ 1kHz – Better than 0.3% |
| Frequency Response          | 20Hz to 20kHz +/- 0.25dB   |

### Performance

|   |   |
|---|---|
| Digital to Digital (AES3)                     | -1dBFS, 20Hz to 10kHz - Better than 0.0001% |
| Distortion                                    |   |
| Digital to Digital (AES3 with SRC) Distortion | -1dBFS, 20Hz to 10kHz - Better than 0.0002% |
| Frequency Response (Analog Input to Output)   | 20Hz to 20kHz +/- 0.5dB                     |

### Synchronization

|   |   |
|---|---|
| 48kHz synchronization   | NTSC/PAL Video<br>Tri-Level<br>TTL Wordclock (48kHz)<br>AES/EBU Digital input (48kHz)<br>Internal Crystal Reference |
| The system can be pre-set with up to four external sync sources, plus internal, such that if the 1st source fails, it will automatically switch to the 2nd and so on. |   |

### Environmental Considerations

|                   | Operating                    | Non-Operating                   |
|-------------------|------------------------------|---------------------------------|
| Temperature Range | 0°C to +30°C (32°F to +86°F) | -20°C to +60°C (-4°F to +140°F) |
| Relative Humidity | 25% to 80% Non-condensing    | 0% to 90% Non-condensing        |
| Maximum Altitude  | 2,000 Meters (6500ft)*       | 15,000 Meters (49,000ft)        |

- Analog input for 0dBFS can be pre-set globally to +28, +24, +22, +20, +18 or +15dBu
- Pre-fader headroom on mic inputs is adjustable globally from +24 to +36dB in 2dB steps
- Analog output for 0dBFS matches input setting into >1kOhms (+24dBu max into 600 Ohms)

*\*This is the limit to which the safety tests are valid.*

### Maximum Cable Lengths

| Cables          |                  | Maximum Length |              |
|-----------------|------------------|----------------|--------------|
| From            | To               | Feet           | Meters       |
| Control Surface | DSP Rack         | 300 (copper)   | 90 (copper)  |
|                 |                  | 16500 (fiber)  | 5000 (fiber) |
|                 |                  |                |              |
| DSP             | Hydra2 I/O Boxes | 300 (copper)   | 90 (copper)  |
|                 |                  | 16500 (fiber)  | 5000 (fiber) |
|                 |                  |                |              |

Calrec Audio Ltd reserve the right to change specification without notice. E&O.E. Apollo, Artemis, Hydra2 and Bluefin2 are trademarks of Calrec Audio Ltd. All other trademarks acknowledged.

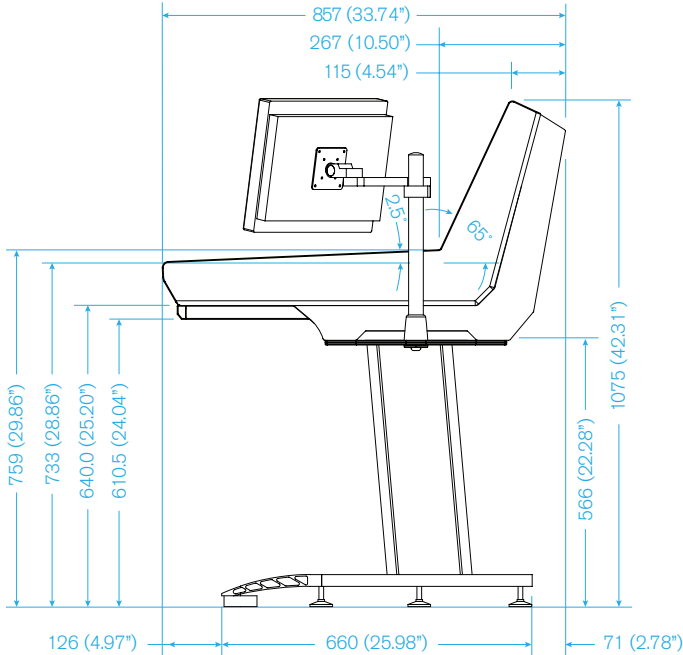
All other trademarks acknowledged.

Designed and produced by Rees & Company.

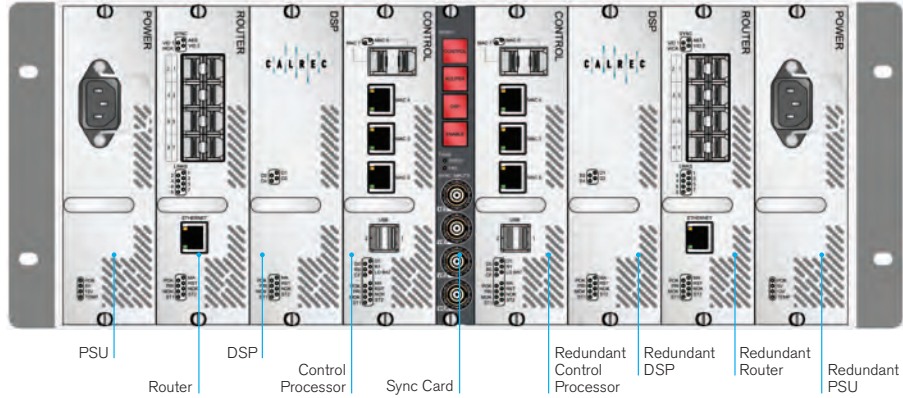
## Artemis surface sizes

Standard Artemis fader modules are 260mm (10.24") wide and contain eight faders across their width. The monitor panel is 200mm (7.87") side. Standard frame modules are 2, 2.5 and 3.5 modules wide, plus a 3mm (0.12") bulkhead at either end. Depending on the frame size of the console, these dimensions may vary. Typical surface widths are shown here – these include 18mm (0.71") standard side trims. Artemis is also available with an optional OB side trim of 5mm (0.2") each side. For desk top mounting, leg dimensions may be discarded although external measurements still apply.

## Control surface end profile



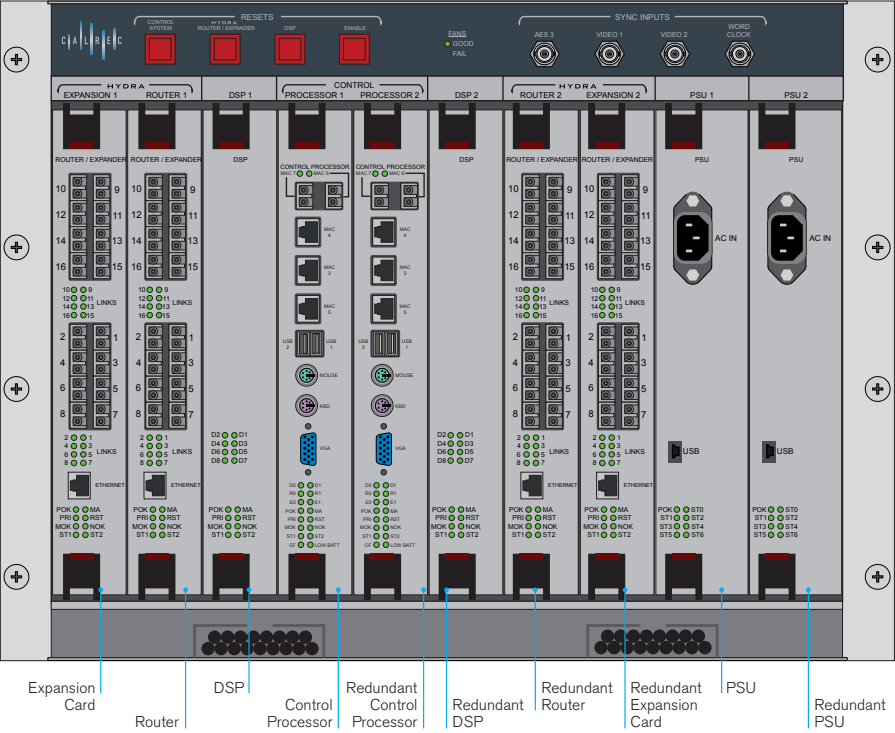
## Typical 4U rack layout



## Typical surface measurements

| Faders | Frame sizes  | Max Surface Width (without Mon screen) | Max Surface Width (with Mon screen) | Internal Leg  | External Leg  |
|--------|--------------|--|-------------------------------------|---------------|---------------|
| 24     | 3.5          | 1022 (40.24")                          | 1067 (40.01")                       | 580 (22.83")  | 740 (29.13")  |
| 32     | 2, 2.5       | 1288 (50.71")                          | 1333 (52.48")                       | 840 (33.07")  | 1000 (39.37") |
| 40     | 2, 3.5       | 1548 (60.94")                          | 1593 (62.72")                       | 1106 (43.54") | 1266 (49.84") |
| 48     | 2, 2.5, 2    | 1814 (71.42")                          | 1859 (73.19")                       | 1140 (44.88") | 1300 (51.18") |
| 56     | 2, 3.5, 2    | 2074 (81.65")                          | 2119 (83.43")                       | 1330 (51.18") | 1490 (58.66") |
| 64     | 2, 2, 2.5, 2 | 2340 (92.13")                          | 2385 (93.90")                       | 1330 (51.18") | 1490 (58.66") |

## Typical 8U rack layout





C | A | L | R | E | C



**ARTEMIS**  
Shine



**ARTEMIS**  
Beam



**ARTEMIS**  
Light

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