



The Product Book
Let's get talking



Introduction

Calrec is a leading designer and supplier of audio broadcast mixing equipment, relied on by the world's most successful broadcasters.

Formed as a microphone manufacturer in 1964, Calrec's reputation for build quality, reliability and audio performance has made it an industry benchmark across the world.

Now, broadcasters demand even more versatility and integration from their audio equipment. In this highly progressive era, TV companies want to ensure that their systems can produce programmes increasingly efficiently and to exacting specifications.

For their audio systems to achieve this, greater consideration has to be given to networks as a whole, and how efficiently they can be controlled.

Calrec understands modern broadcast facilities, and works alongside broadcasters to keep ahead of the changing needs of the broadcast environment.

Calrec is at the heart of changing broadcast requirements with its range of broadcast mixing consoles, remote production and audio networking solutions, its understanding of AoIP and IP Infrastructures, and its work with third-party integration.

All Calrec products are designed, engineered and tested at Calrec's Nutclough Mill headquarters in Hebden Bridge, West Yorkshire, England.

From customer research through to R&D, production and test departments, every element of product development is in-house. This ensures the integrity of the entire process and guarantees a quality standard unsurpassed in the broadcast console marketplace.

Calrec is a broadcast specialist and over the last 60 years, has earned a reputation for innovation with a history of technological world firsts:

Calrec is part of the Audiotonix family alongside DiGiCo, SSL, Allen & Heath, Klang Technologies, Sound Devices, Slate Digital and Harrison.





1977: Calrec supplies the world's first stereo broadcast console.

1978: Calrec launches the Soundfield microphone, the world's first single-point source microphone capable of recording sound in three-dimensions for surround compatible playback.

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. This technology was another world first for Calrec.

2009: Calrec launches Apollo and introduces Bluefin2, the next generation of Calrec's award-winning Bluefin technology. The Apollo platform quickly led to the development of Artemis. Calrec also unveils Hydra2, allowing the construction of complex routing networks with control software.

2016: Calrec launches Brio, a super-compact digital mixing console with more faders in a given footprint than any other audio console, built in I/O and DSP and an integrated touchscreen UI.

2018: The Type R and ImPulse cores introduce new IP-based processing and routing with native SMPTE 2110/AES67 connectivity. Calrec unveils Calrec Assist a HTML-based remote-control UI for a range of Calrec consoles. Based on Bluefin3, ImPulse provides built-in 3D immersive path widths and downmixing.

2020: Calrec launches the Calrec Sound Institute, featuring free certified training on Brio, Type R, Summa, immersive mixing and AoIP.

2022: Calrec launches Argo - a new approach to audio mixing. Argo is a intuitive, flexible, IP native, user-definable control surface with supercharged DSP, interchangeable panels and configurable layouts. ImPulse1 is unveiled, the powerful 1U IP audio processing and routing engine designed for small to medium single mixer applications with an optional second core for redundancy.



Argo



Argo Q

Designed to adapt to changing production needs, Argo is a new approach to audio mixing with a flexible control philosophy that breaks the traditional geographic tie lines between processing and control.

Flexible

Fully modular and with interchangeable hardware panels, Argo is built around Calrec's time-served Assist UI. This means that whether you are on physical panels or a remote GUI, the user interface is both familiar and easy to drive.

Argo's panel system encourages broadcasters to adapt surface hardware to meet their unique requirements, with two mid-level rows of interchangeable panels on the larger Argo Q model, and one mid-level row on the compact Argo S model. Calrec has also introduced a comprehensive system of user templates to instantly change the hardware user interface to meet changing requirements or user preferences.

Powerful IP Core

Built around an expanded version of Calrec's ImPulse technology means the location of the control surface is not tied to the processing core. It can power up to four independent mix environments, including headless mixers accessed via public internet.

User Friendly

Argo's control surface uses optically bonded touchscreens to provide unrivalled visual feedback and speed of access.

Soft panels provide a richer user experience and hardware panels allow users to build definable functions and apply these as templates - this helps operators move around the surface faster and makes it more intuitive.

Maximum Uptime

Argo builds on Calrec's broadcast-specific and industry-leading surface redundancy. All control elements can be duplicated so an operator can use any panel to access inputs and controls, while fader scrolling functionality adds more protection.

Combined with standard redundant hardware, Argo provides SMTPE's hitless packet merging alongside a second layer of hardware redundancy to guarantee broadcast uptime.

I/O on the Fly

Argo includes optional AoIP I/O modules which can be fitted directly into the control surface, with a variety of I/O options. These can be fitted into every section of the console to give the operator a variety of options, make cabling more efficient and save I/O space.

Next Generation Audio Ready

With NGA content on the increase and broadcasters adding value to productions with increasingly complex NGA output formats, Argo provides tools to make everything simpler to organize and manage.

Multi-channel sources can be controlled on a single fader but spilled out onto more faders for fine control; Argo allows spill faders to be placed anywhere on the control surface, on any layer and in any position to free up space and make the workspace more adaptable to individual needs.



Total DSP paths	2384
Input channels	2048
Mains	16
Groups	48
Tracks	96
Auxes	48
Max Faders	240
Track sends per ch/gp path	4
Direct/Mix minus Output leg pool	1024
Direct/Mix-minus Output per ch/gp path	4
Mix-minus busses	1
Insert leg pool	1024
Inserts per ch/gp/mn path	2
Inserts per aux/track path	2
Input delay leg pool	256
Output delay leg pool	256
Path delay	<i>All legs of all path types</i>
Delay time	<i>Up to 5.4 secs on each input, path and output delay block</i>
<hr/>	
EQ	<i>6 band parametric on every channel group, main, aux and track</i> <i>6 and 12db per octave slope options on any band operating with shelf response</i> <i>6, 12 and 18db per octave slope options on bands 1 and 2 when set to HF/LF filter response</i>
<hr/>	
Dynamics	<i>2 x compressor/limiter + 1 x expander/gate/ducker on every channel, group and main</i> <i>2 x compressor/limiter on every aux and track</i>
<hr/>	
Sidechain EQ	<i>2 x bands sidechain EQ on every channels dynamics¹ (1 x comp/lim + exp/gate/ducker)</i> <i>1 x band sidechain EQ on every group and main dyn (1 x comp/lim + exp/gate/ducker)</i>
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Key Input (sidechain source selection)	<i>Compressor 1 + expander/gate/ducker on channels/groups/mains can be keyed from audio on any mono path</i> <i>Up to 64 mono paths can be used as keys at any given time</i>
<hr/>	
Automixer	<i>8 x Automixer each controlling an unlimited number of mono or stereo paths</i>
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Autofader	<i>Advanced Autofader (AFV) functionality on all faders</i>
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Monitoring	<i>2 x control room LS (with AFL), 3 x PFL and AFL busses, 4 x misc monitor outputs</i>



Argo S



Apollo



Surface

- 100mm faders with mechanical PFL overpress
- 12 A/B layers, providing 24 possible assignments for each fader
- Colour-changing rotary knobs to indicate function
- Touch screens controlling I/O, monitoring and routing

Processing

- 1292 DSP paths
- 1020 input channels
- Up to 16 x stereo or 5.1 surround main outputs*
- Up to 48 x mono, stereo or 5.1 surround audio groups*
- 96 x multi-track buses for IFB or recording
- 4 x track sends per path
- 48 x auxiliary buses
- Up to 4 x direct outputs/mix minus sends per path
- Direct outputs can be pre-EQ, pre-fader or post-fader
- 3 x independent user sections with independent monitoring
- All channels and groups have 6-band parametric EQ
- All channels, groups and mains have full dynamics
- 2 x compressor/limiter
- 1 x expander/gate
- 2 x sidechain EQ/filters on every channel
- 1 x sidechain EQ on mains and groups
- 256 x inserts
- Up to 2.73s delay per output from a pool of 256 channels
- Up to 2.73s delay per input from a pool of 256 channels
- All paths have 2.73s delay in addition to in and out delay
- 12 fader layers, each with its own A and B paths
- 8 x AutoMixers, each controlling an unlimited number of mono paths
- Advanced Autofader (AFV) functionality on all faders

Networking

- Integral 8192² router
- 16/32 router ports
- All I/O provided over Hydra2 network via a comprehensive range of Hydra2 I/O boxes
- 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
- Independent DSP operation ensures audio continuity in the event of a PC or control reset
- Low power consumption and heat generation

* From a mains/group pool of 128 resources

Apollo+



Apollo+ is built on the hardware architecture of the Apollo surface, and combines it with the power and flexibility of Calrec's ImPulse IP processing core, the third generation of Calrec's award winning Bluefin DSP.

Existing Apollo consoles can be upgraded with Impulse core to be made compatible with IP environments.

Apollo+ has the option of five different DSP pack sizes and enables broadcasters to hang four independent mixing environments onto a single core.

It has native SMPTE 2110/AES67 connectivity and is compatible with existing Apollo control surfaces providing a simple upgrade path for existing Calrec customers.

Apollo+ also provides 3D immersive paths up to 7.1.4 wide and panning for next generation audio applications. Height and 3D pan controls are provided, with flexible panning and downmixing built in.

The full feature set for all Calrec consoles, including Apollo+, are at the back of this product guide.

Processing

- Contains next generation "Bluefin3" DSP
- Up to 1458 DSP paths
- Up to 1122 input channels
- Main and group bus pool expanded to 192
- Delay legs increased to 5.4s
- Supports 3D immersive path widths for next generation audio
- Input channels, groups and main paths support mono, stereo, 5.1, 5.1.2, 5.1.4, 7.1, 7.1.2, 7.1.4 width
- Immersive paths have an additional "height" legs to produce a 3D soundfield
- Height and 3D pan controls are provided with flexible panning and downmixing built in
- Monitoring and metering provided immersive content



160 fader Apollo, MLB Networks, USA

Covering live Major League Baseball and National Hockey League, MLB Network use two Apollo consoles linked to a router core to create a powerful and flexible network.

"The interface between the operator and the console/network is logical, which allows mixers to adapt to changes that happen with our live, sports-highlight programming."

Mark Haden, Vice President of Engineering and IT, MLB Network

128 fader Apollo, SS22, NEP, USA

NEP Supershooters' SS22 high-definition mobile production truck is designed for quick set-ups and increased efficiencies. NEP is a trusted and valued Calrec customer with multiple Calrec consoles.

"We had a very significant requirement from ESPN for a very large audio console with extra faders for their NBA coverage. We have been very focused and deliberate about our audio requirements."

George Hoover, CTO NEP Broadcasting





56 fader Apollo, AMP, France

France's AMP Visual TV installed Apollo and Artemis consoles into its Millennium Signature 12 (MS12) remote production unit.

Boasting the world's largest surface area at 76-sq-m, MS12 hosts a 56f Apollo, a 24f Artemis Light, and a 16f Artemis sidecar that can be used to extend the other two.

"We wanted to be able to maximize the equipment for any size of international production. The flexibility and modularity of the Calrec desks made them a perfect fit for this vision. The consoles offer full redundancy to give us peace of mind for major events, and their plug-and-play operation simplifies productions and gives us even more versatility. "Calrec is renowned for technology excellence in OBs. We know we've made a great choice."

Emmanuel Le Marquand, AMP Visual TV Audio Operations Manager

80 fader Apollo, TV Tokyo, Japan

Replacing an analogue console, TV Tokyo's Tennozu studio was upgraded with an Apollo as part of a major update to the broadcaster's flagship studio and was the second Apollo in TV Tokyo's inventory.

"TV Tokyo's challenge was to source a desk that could match their old console in sound quality. The Apollo more than exceeds TV Tokyo's expectations for pristine sound, and its impressive feature set is also a huge improvement."

Yosuke Maruyama of Hibino Corporation



Artemis



	Artemis Shine	Artemis Ray	Artemis Beam	Artemis Light
- DSP paths	904	680	564	384
- Input channels	680	456	340	240
- Main outputs	Up to 16 from pool of 128	Up to 16 from pool of 128	Up to 16 from pool of 128	Up to 16 from pool of 72
- Groups	Up to 48 from pool of 128	Up to 48 from pool of 128	Up to 48 from pool of 128	Up to 48 from pool of 72
- Track buses	Up to 64	Up to 64	Up to 64	Up to 48
- Aux buses	Up to 32	Up to 32	Up to 32	Up to 24
- AFL systems	3	3	3	3
- PFL systems	3	3	3	3
- Inserts	Pool of 256	Pool of 256	Pool of 256	Pool of 128
- Chan/grp direct/ mix minus outputs	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 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	128 legs of 2.73s
- Output delay	256 legs of 2.73s	128 legs of 2.73s	128 legs of 2.73s	128 legs of 2.73s
- Path delay	2.73s per path	2.73s per path	2.73s per path	2.73s per path
- Track sends/chan or grp	4	4	4	4
- EQ 1-4	4 band para	4 band para	4 band para	4 band para
- EQ 5-6	2 band para	2 band para	2 band para	2 band para
- Sidechain EQ	2 band para	2 band para	2 band para	2 band para
- Dynamics 1	Comp/lim and exp/gate	Comp/lim and exp/gate	Comp/lim and exp/gate	Comp/lim and exp/gate
- Dynamics 2	Comp/lim	Comp/lim	Comp/lim	Comp/lim
- Max faders	72	72	64	56
- Layers	12 dual layers	12 dual layers	12 dual layers	12 dual layers
- Automixers, each controlling an unlimited number of mono paths	8	8	8	8
Router Ports	16/32	16/32	16/32	8
Networking	Integral 8192 ² router All I/O provided over Hydra2 network via a range of Hydra2 I/O boxes. Cat5e or fiber connectivity	Integral 8192 ² router	Integral 8192 ² router	Integral 4096 ² router
Surface	<ul style="list-style-type: none"> - 100mm faders with mechanical PFL overpress - 12 A/B layers, providing 24 possible assignments for each fader - Colour changing rotary knobs to indicate function - Touch screens controlling I/O, monitoring and routing 			

Artemis+



Artemis+ is built on the hardware architecture of the Artemis surface, and combines it with the power and flexibility of Calrec's ImPulse IP processing core, the third generation of Calrec's award winning Bluefin DSP.

Existing Artemis consoles can be upgraded with Impulse core to be made compatible with IP environments.

Artemis+ has the option of five different DSP pack sizes and enables broadcasters to hang four independent mixing environments onto a single core.

It has native SMPTE 2110/AES67 connectivity and is compatible with existing Artemis control surfaces providing a simple upgrade path for existing Calrec customers.

Artemis+ also provides 3D immersive paths up to 7.1.4 wide and panning for next generation audio applications. Height and 3D pan controls are provided, with flexible panning and downmixing built in.

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- Input channels, groups and main paths support mono, stereo, 5.1, 5.1.2, 5.1.4, 7.1, 7.1.2, 7.1.4 width
- Immersive paths have an additional "height" legs to produce a 3D soundfield
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- Monitoring and metering provided immersive content



32 fader Artemis, Al Jazeera Balkans, Bosnia

As part of an expansion and upgrade project, Bosnia's Al Jazeera Balkans installed a Calrec router core, two Artemis audio consoles, and a Summa console.

"We chose Calrec because they offer very powerful, rock-solid consoles built with broadcasters in mind. That's why Calrec is at the heart of our audio infrastructure."

Mirad Isakovic, Manager of the Broadcast Technology Department, Al Jazeera Balkans

32 fader Artemis, Hedgehog, Lebanon

Hedgehog installed a 32-fader Artemis Light console into Lebanon's first HD OB truck. It can handle up to 14 HD cameras and houses a full production setup to meet the demand for HD television production.

"Not only do we have Lebanon's first HD OB truck, but it is also the first OB truck in Lebanon to have this degree of audio power. Calrec was an obvious choice because it has a long, successful history in OB trucks."

George Moufarrej, Hedgehog CEO and Managing Director





56 fader Artemis, Full Sail University, USA

Full Sail University expanded its world-class performance venue, Full Sail Live, with Calrec's Artemis and Brio36 consoles. The consoles are available to both students and external clients.

"By choosing Calrec's Artemis and Brio36 consoles for the venue, we now have the ability to grow the system and scale it towards the events in that space. Calrec is providing us with a lot more room to grow in terms of the number of busses, channels and networks."

Scott Dansby, Director, Industry Relations, Full Sail University

48 fader Artemis, Tilt, Spain

Madrid-based Tilt, a bespoke audio and video broadcast service provider, installed an Artemis Light console following considerable business growth with customers across sports, music, commercials and documentaries.

"We have a modest budget, so price point measured against performance was very important to us. We also didn't want to have to worry about channel count and to know that we always have all the capacity that we need; we have more than satisfied that requirement with this Calrec install."

Jaume Bordoy, Manager at Tilt



Summa



Surface

- 100mm faders with PFL overpress
- Six surface layers
- Built-in talkback microphone
- Stereo headphone output

Processing

- 300 DSP paths
- 180 input channels
- 4 x main outputs (mono, stereo or 5.1)
- 8 x audio sub-groups (mono, stereo or 5.1)
- 32 x track outputs (mono or stereo)
- 16 x auxiliary outputs (mono or stereo)
- 1 x direct output per channel* (pre EQ, pre fader or post fader)
- 1 x mix minus output per channel* (can be fed from auto minus, auxes, tracks or off Air conference bus)
- 1 x auto minus bus
- 1 x off air conference bus
- 1 x insert on every channel, group, main and console monitor output
- 152 x external monitor and meter inputs
- 4 x Automixers, each controlling an unlimited number of mono paths
- Unlimited VCA groups
- 6-band parametric EQ on every channel, group, main

- Dynamics processing on every channel, main, group, aux and track (2 x compressor/limiter, expander, gate, sidechain EQ/filters)
- 2.73s of delay within every channel, group, main, aux and track
- An additional pool of 128 legs of assignable input delay (2.73s each)
- An additional pool of 128 legs of assignable output delay (2.73s each)
- 5.1 console monitor output (with dedicated small LS and PFL/RTB outputs)
- 3 x 5.1 studio monitor outputs
- Advanced Autofader (AFV) functionality on all faders

Networking

- Integral 4096² router
- 8 redundant router connections for networking consoles and connecting I/O boxes
- All I/O provided over Hydra2 network via a wide range of I/O formats
- Cat5e or fiber connectivity

Resilience

- Highly resilient. PSU, DSP, control processor and router Modules are hot-swappable and have automatic redundancy
- Independent DSP operation ensures audio continuity in the event of a surface reset
- Low power consumption and heat generation

* From a pool of 188 mono resources shared between direct outputs and mix minus outputs.



24 fader + 8 fader Summa, University of Missouri, USA

Calrec's Summa drives professional broadcast-quality sound for the University of Missouri Athletics department (Mizzou Athletics).

"The improved audio quality definitely makes our live broadcasts stand out. But the Summa also plays a big role in helping us prepare our students for the workplace."

Stan Silvey, Assistant Athletic Director, Broadcast Operations, Mizzou Athletics

24 fader +8 fader Summa, Kuwait TV, Kuwait

Kuwait Television (KTV), part of the Kuwaiti Ministry of Information, installed a Summa into an OB van to give KTV the flexibility to cover a wider variety of programming.

"The Summa enables us to take our audio coverage to new heights, and its advanced audio capabilities mean less reliance on third-party companies and on other departments."

Waleed Hamadah, TV Broadcast Engineer, TV Engineering Division, Ministry of Information





24f+8f Summa, LeSports, Hong Kong

LeSports in Hong Kong installed 3 x Summa consoles for its OTT sports video platform. LeSports Hong Kong chose the Summas for their wealth of features and extreme ease of operation.

"At LeSports Hong Kong, we are constantly striving to improve our programming and expand our multiformat content. Summa is an important step in achieving these goals, because they make even the most demanding audio playout tasks very straightforward."

Mr. P.K. Lee, LeSports, Hong Kong

24f+8f Summa, HD Protek, Turkey

Turkish OB company HD Protek installed a Summa as part of an upgrade to its HDP 04 outside broadcast unit. The installation marked the first Summa in the Turkish OB market.

"Knowing that the console will work without question is a big comfort to us. Summa adds a powerful new audio-mixing option to our fleet, so we can handle more complex shows more easily."

Yucel Ozacar, General Manager of HD Protek





24f+8f Summa, Jimmy Swaggart SonLife Broadcasting USA

Reverend Jimmy Swaggart's SonLife Broadcasting Network (SBN) now relies on Summa and Brio consoles for all its live broadcasts.

"SBN produces approximately six hours of live studio production daily. We needed consoles that were reliable and broadcast-ready at all times."

Dave Cooper, Director at SonLife Broadcasting Network

24f+8f Summa, AV Compañía de Producciones, Spain

Summa is turbo-charging audio coverage aboard UM 21, a 4K OB vehicle designed by Spanish production company VAV Compañía de Producciones.

"We faced some significant challenges designing UM 21 — not only in meeting Dorna Sports' specific requirements but also the technical complexities of covering a racing circuit like the FIM CEV. We knew the Summa desk would be up to the task, and it has not disappointed."

Israel Perez, Chief Technology Officer of VAV



Brio 12 or 36

Standard:
SL6351: 36
SL6480: 12

Slim trims:
SL6484: 36
SL6489: 12



brio.36 duet

Comes with internal Hydra2 connectivity, comprehensive built-in IO and 96 input channels as standard

brio.36 medley

Comes with internal Hydra2 connectivity, comprehensive built-in IO and 96 input channels as standard, plus a Dante 64 card or MADI I/O module and an external Br.IO box with an additional 24 mic/line inputs, 16 analogue outputs & 8 AES I/O

Surface

- 12 or 36 x dual layer faders - 100mm, motorised, with PFL overpress
- Compact footprint:
- Brio 36 only 892mm wide x 892mm deep x 270mm high
- Brio 12 only 484mm wide x 892mm deep x 270mm high
- 1 x user assignable rotary control per strip
- 2 x user assignable buttons per strip

DSP

- Freely configurable on the fly, operates at 44.1, 48, 88.2 and 96kHz:
- Up to 96 legs assignable as mono, stereo, or 5.1 input channels*
- 36 legs assignable as mono, stereo or 5.1 mains or groups
- 24 legs assignable as mono or stereo auxes
- Up to 96 legs assignable as Insert sends and returns*
- Up to 96 legs assignable as direct, or mix-minus outputs*
- Automatic mix-minus
- Off-air conference for mix-minus

Dynamics

- Every input channel and group path:
- Expander/gate/ducker, with key input and sidechain EQ
- Compressor with key input and sidechain EQ
- Multiband compressor
- Expander/gate/compressor on every aux

- Single band multi band compressor on every channel
- 2 x Automixers available to all mono input channels and groups

EQ

- 6 band EQ available on every input channel, group, aux and main path:
- 4 band full PEQ
- 2 band LF/HF filters, 12 or 24dB/octave

Delay

- Delay available on every path with selectable position
- Up to 64 legs assignable as path delay
- Up to 64 legs assignable as output delay
- Up to 64 legs assignable as input delay

Monitoring/Metering

- 3 x monitor outputs
- Surround capable metering within each strip
- Configurable meter screen output (DVI)
- Loudness meters

Remote/Automated Control

- Remote/automated control
- 8 x GPI + 8 x GPO built in**
- Autofaders for Audio Follows video style control
- CSCP mixer control protocol interfaces with a variety of video switchers and production automation systems
- SW-P-08 'Pro-Bel' router control protocol
- EMBER

I/O

- 24 x mic/line inputs**
- 16 x Analogue outputs**
- 8 x AES3 digital inputs**
- 8 x AES3 digital outputs**
- 3 x expansion slots to increase standard built in I/O, or to provide interface to other formats, including SDI, MADI, Dante etc
- Hydra2 module allows for further I/O to be connected, and to network audio with other consoles



Brio 36, Ravensbourne University, UK

Ravensbourne University, who specialise in digital media and design, chose Brio for their television and broadcasting studio due to its exceptional capability and smaller footprint.

"The Calrec Brio, partnered with an I/O frame populated with analogue and digital I/O modular cards, was the perfect fit, connected together with a Hydra2 hub. This set up will enable us to accommodate AoIP, Dante and MAD1 as we grow the system over time... The ability for the desk to output its UI onto an external monitor will complement the teaching delivery and make the learning far more effective. Particularly as the Brio packs such a large amount of functionality and configuration into its small footprint."

Howard Austen, Senior Media Services Engineer, Ravensbourne University London

Brio 36, WhitebaitMedia, New Zealand

WhitebaitMedia, the producers of New Zealand's longest running kids show, "What Now," chose the Calrec Brio36 as its new mobile broadcast console.

"The Calrec Brio was the logical choice, because it was the only one to offer the power and flexibility of a larger broadcast console, but at the budget and size of the smaller consoles."

Tim Murdoch, WhitebaitMedia's Technical Manager





Brio 36, Proshow Broadcast, Canada

Proshow Broadcast upgraded its Prodigy HD truck with Brio to bring new levels of broadcast-grade functionality to Prodigy's coverage for major sports broadcast clients including the Pac-12 Network.

"The term 'revolutionary' might be overused in our industry, but the Brio is revolutionary in many ways. There really is nothing else like it for the price point — a truly compact console that doesn't make any compromises on broadcast feature set."

Tim Lewis, President, Proshow Broadcast

Brio 36, Full Sail University, USA

A pair of Brio consoles at Full Sail University provide hands-on training in audio mixing for students in the Film bachelor's degree program, as well as being utilized in the university's on-campus performance venue.

"The Brio's deliver the core functionality that students need at a price point that made sense for us. Since these systems are used throughout the industry, we knew we'd be giving our students experience on a board they'll be using in the future and throughout their careers."

Scott Dansby, Director, Industry Relations at Full Sail University



Brio 36, Bleacher Report, USA

Popular online sports publisher Bleacher Report installed two Brio consoles for programming ranging from pro and college football, soccer, and basketball to fantasy football and panel shows.

"The Brios are our first Calrec desks, and they're a great addition to our team. Brio can accommodate any skill level, which makes it really ideal for our crew. The layout is easy to grasp at first glance and displays the data in a very intuitive and natural manner."

Mark Steinmetz, Studio Operator/Audio Engineer, Bleacher Report



Brio 36, Rush Media, USA

Brio was the console of choice for Rush Media's recently completed six strong new OB fleet. Primarily used for sports broadcast, the mobile unit provider was looking for a high-quality audio console with a small footprint.

"The Brio is the perfect fit to bring all of the equipment elements together, in a limited space, with no other console at this price point coming close. Our job became a lot easier once we made the switch to Calrec, with both integration and implementation. With various engineers using the console from show to show, ease of use is really important. The Brio, as with all Calrec consoles, is built for broadcast; the user is up and running a few minutes after sitting down."

Rusty Cummins, Senior Engineer, Rush Media



Type R



Type R is a modular, expandable, IP-based mixing system for TV and radio which utilises standard networking technology and combines it with soft panels that can be tailored to operator needs.

Simple customisation across networks, open control protocols and surface personalisation means Type R can be used with or without a physical surface. Up to three independent mixing environments can be operated remotely from just one core. Control and setup can be via Calrec's browser-based Assist application and it is fully compatible with automated systems. Broadcast specific control is clear and concise across the system. Bussing, including the creation of mix-minus feeds, is quick to assign, while EQ and dynamics control is clear and fast. And as you would expect from Calrec, Type R is a resilient console system designed for reliable professional use, with all the requisite power, function and scalability to keep your station on-air for many years to come.

Processing

- Multiple sample rates; operates at 44.1 and 48kHz. All DSP facilities available at all sample rates.
- Between 20 and 120 input channels per console
- Up to 3 x (mono / stereo / 5.1) main outputs
- Up to 8 x (mono / stereo / 5.1) a groups
- Up to 16 (mono or stereo) aux outputs
- 4 band full parametric EQ and LF/HF filters with 24db/octave slopes on every channel/group/aux/main
- Compressor/limiter on all direct outputs and mix minus outputs
- Expander/gate/ducker with sidechain EQ on all channels and groups
- De-esser on all channels
- Automixer on every mono channel/group
- 1 x insert sends and return per channel/group/aux/main (mono, stereo or 5.1)
- 1 x assignable direct output per channel/group
- 1 x assignable mix-minus output per channel/group
- 11 x mono mix minus buses
- 1 x off-air stereo conference bus
- Unlimited VCA groups
- 5.4s input delay per channel from a pool of 48 legs
- 5.4s path delay for every path from a pool of 48 legs
- 5.4s output delay per output including direct outputs from a pool of 48 delay legs
- 48 x external monitor/meter inputs



MU6411

The touch-screen soft panels are designed around simple and colourful control elements and can be customised as multi-function panels from show-to-show. The Talent Panel (below) can be easily added and an IP endpoint.



MU6410



IM6413



MY6583



Type R, RTM, Malaysia

Radio Television Malaysia installed six Type R consoles as part of a move to implement a new IP audio network infrastructure at Perlis FM. The facility is now the reference for all future upgrades to RTM's other regional stations.

The complete radio system included a full IP network and visual radio technology to support video streaming to social media and other online platforms.

The IP native Type R consoles are located in Perlis FM's Main Conty, Standby Conty, Edit (1 & 2), Ingest, News Depot Studios and Master Control Room respectively.

Type R, Boîte à Outils Broadcast, France

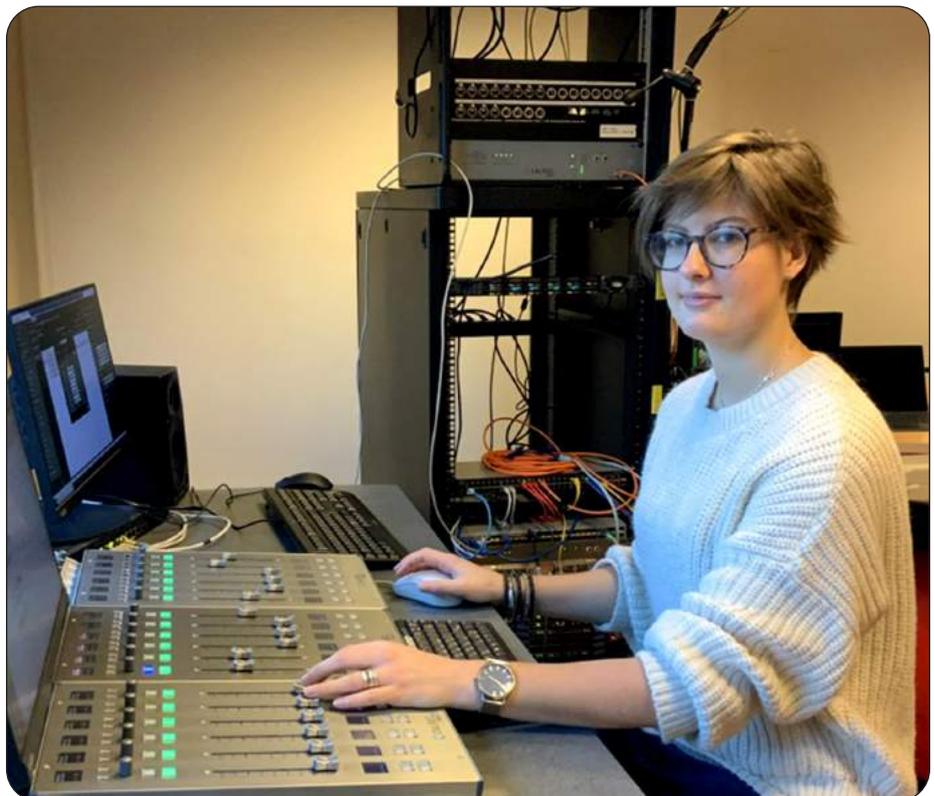
Calrec's Type R console was used as a remote console over ST2110 and installed at home by the sound engineer. Remote control was achieved using Calrec's virtual mixing UI Calrec Assist via Google Chrome, giving access to console features such as aux sends, Automix and monitor feeds.

"Calrec's Type R is a modular mixer with ST2110 compatibility. All of the faders or screen are connected via IP to the core and stageboxes are connected to the core with a ST2110 feed.

"This mixer fitted perfectly with this use case because it's made for IP. Having the ability to network multiple IP devices for each console is very useful.

"Consoles are managed via a web Interface, and in the case of a network problem at the Sound Engineer's home, we can take control from the control room using the web GUI or a physical fader panel."

Marine Martignac, Freelance Audio Technician



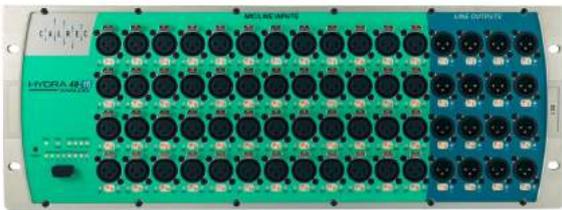
Fixed Format I/O



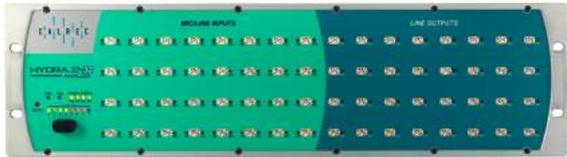
AD5782
Analogue mic/line 12 in/4 out - XLR (Hydra2 and IP)



AD5781
Analogue mic/line 24 in/8 out - XLR (Hydra2 and IP)



AD5780
Analogue mic/line 48 in/16 out - XLR (Hydra2 and IP)



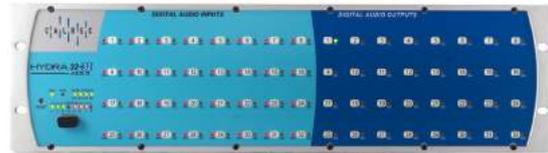
AE5743, AE5991, AE5992
Analogue mic/line 32 in/32 out - EDAC (Hydra2 and IP)



JB5606
Digital AES3 16 in/16 out - BNC (Hydra2 and IP)



JB5783
Digital AES3 32 in/32 out - BNC (Hydra2 and IP)



JB5962
Digital AES3 rear mount 32 in/32 out - BNC 4 (Hydra2 and IP)

Type R I/O



JD6503
Type R IP AES I/O Interface box - 4 x AES inputs, 4 x AES outputs, 8 x analogue mic/line input, 8 x analogue line level output, 6 x GPI, 6 x GPO ports and 2 x stereo headphone outputs



AD6502
Type R IP Analogue I/O Interface box - 16 x channels of analogue mic/line input, 16 x channels of analogue line level output, 6 x GPI and 6 x GPO ports



AD6501
Type R IP Combo I/O Interface box - 8 x AES inputs, 8 x AES outputs, 6 x GPI and 6 x GPO ports

Modular I/O

Digital I/O



JX5869
4 x Digital AES input (XLR)



JB5860
4 x Digital AES input (BNC)



JX5868
4 x Digital AES output (XLR)



JB5837
4 x Digital AES output (BNC)



JD5842
8 in, 8 out digital AES (D-type)



JM6199
1 x Madi in/out - AES10 (BNC/SFP)

SDI, GPIO, AoIP



VI5872
2 x SDI Embedder (BNC)



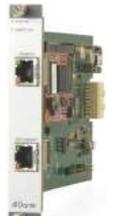
VO5841
2 x SDI De-Embedder (BNC)



WY5858
GPIO, 8 in/8 full changeover out (D-type)



WY5859
GPIO, 8 in/16 out (D-type)



BI6192
Dante with network redundancy (RJ45)



BI6218
Waves Soundgrid (RJ45)

Analogue I/O



AD5840
4 x Mic/line in (XLR)



AL5870
2 x Mic/line in with splits (XLR)



AD6057
8 x Analogue mic/line level inputs (D-type)



AD5838
8 x Analogue line level inputs (D-type)



DA5839
8 x Analogue line out (D-type)



DA5867
4 x Line out (XLR)



AD6365
4 x Transformer mic/line in (XLR)



EE5833
Modular 3U I/O box enclosures with 20 x I/O card slots (Hydra2 and IP)

Br.10*



AD6300

- 24 x Mic/line inputs
- 16 x Analogue outputs
- 8 x AES3 digital inputs
- 8 x AES3 digital outputs

* Only available for Brio and Summa consoles

Fieldbox & H2Hub



AD6217

- 8 x Mic/line inputs
- 8 x Line outputs
- Compact 220mm x 384mm, 1u high
- AC and DC input power



RY6211

- Portable hub or switch point for a Hydra2 network
- Connect up to 4 external connections, which may be I/O boxes or other hubs
- Potential to daisy-chain up to 3 x H2Hubs
- Primary and secondary SFP slots for redundancy

VP2 Headless console

Calrec's VP2 virtualised mixing system has no physical control surface and uses Calrec's Assist software for setup and control.

This enables a station to reap many of the benefits of using a Calrec console, but without a physical control surface.

VP2's 4U core comes in 3 DSP sizes; 128, 180 and 240 input channels.

Assist can be accessed via a web-browser, giving instant control to both the engineering level and the production area.



An expanded feature set provides a comprehensive interface; CSCP allows VP2 to be controlled by an automation system and a low cost, third party fader pack.

Operators can control functions using the automation system/fader pack, and an engineer can fine tune the setup or recall set-ups as needed.

RP1 – Remote production

EE6279



RP1 is a broadcast mixing system in a 2U rackmount box, containing Calrec's award-winning Bluefin2 processing.

It provides local DSP to enable the generation of monitor mixes and IFBs with no latency and gives an operator in a remote studio direct control over channel functions such as mic gains, aux send/monitor mix levels and fader levels.

It also provides a mechanism to embed audio into existing backhaul technologies, such as SDI or SMPTE 2022.

With all DSP for monitor mixes taken care of on-site, the studio transmission console is able to concentrate purely on the main programme mix.

RP1 can embed all the transmission audio into existing video transport mechanisms, ensuring no synchronisation issues. Its modular I/O backbone accepts any of Calrec's I/O cards.

This versatility means RP1 can connect via a range of transports. The studio console mixing the transmission is able to assign these signals where required on the desk, so workflows are exactly the same as any other broadcast.

- 72 virtual control faders
- 3 x expansion slots to increase standard built in I/O, or to provide interface to other formats, including SDI, MADI, Dante etc
- Hydra2 module allows for further I/O to be connected, and to network audio with other consoles
- 8 x GPI + 8 x GPO built in

DSP:

- Up to 96 mono equivalent channel paths
- Up to 24 aux send paths
- 96 direct outputs

RP1 Case Study with the BBC

BBC Sport has been embracing remote production for many years, having used it in Vancouver 2010 Winter Olympics and again in Sochi 2014 and Tokyo 2020.

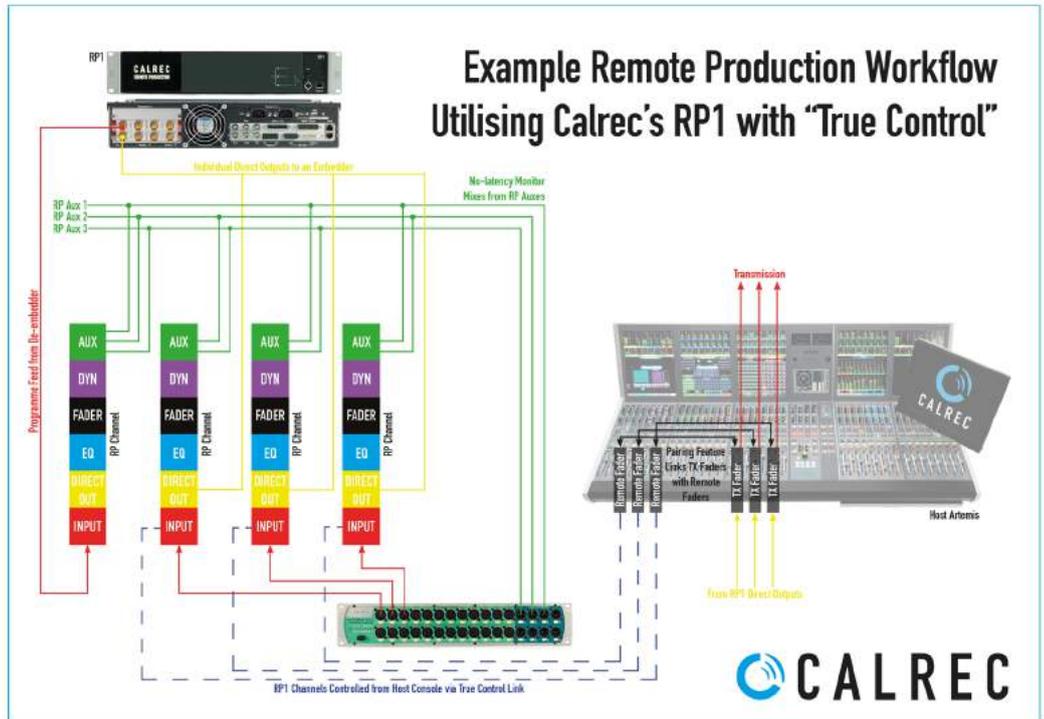
In 2018 Calrec's RP1 solution was successfully deployed with the BBC at both the Olympics in Pyeongchang and the Commonwealth Games in the Gold Coast, Australia.

"Latency is absolutely key to any live sports production – the main consideration being the talent hearing what they need to hear to do their job properly," explains BBC Lead Sound Supervisor Dave Lee. "They need to hear a combination of things: mainly instructional talkback information from the production team plus the programme into which they are contributing.

"They must be able to talk to one another – presenter to commentator to reporter and so on. This involves a lot of bi-directional audio traffic."

Working collaborative with Calrec resulted in RP1, which sits at the remote venue. The latency challenge is solved by providing local DSP channels for mixing the venue audio locally, along with switched talkbacks and mix-minus-all-venues added to each contributor's mix.

"We can now treat audio content generated in the UK, which is behind-time, separately from the instantaneous audio content generated locally. Anything that's available on the event side of the latency, the talent only hears through the RP1 remote mixer; it doesn't pass to the UK and back."



ImPulse core

Calrec is committed to helping broadcasters with their evolving workflows in the transition to IP. Calrec has a range of surfaces and DSP sizes to suit your budget.

ImPulse is a powerful audio processing and routing engine with SMPTE 2110/AES67 connectivity and is compatible with Calrec's next- gen IP consoles: Argo Q and Argo S – and fully compatible with Apollo and Artemis consoles, either as an upgrade or for new applications.

ImPulse has a robust and scalable DSP platform, giving Calrec customers a defined upgrade path as they transfer to IP workflows.

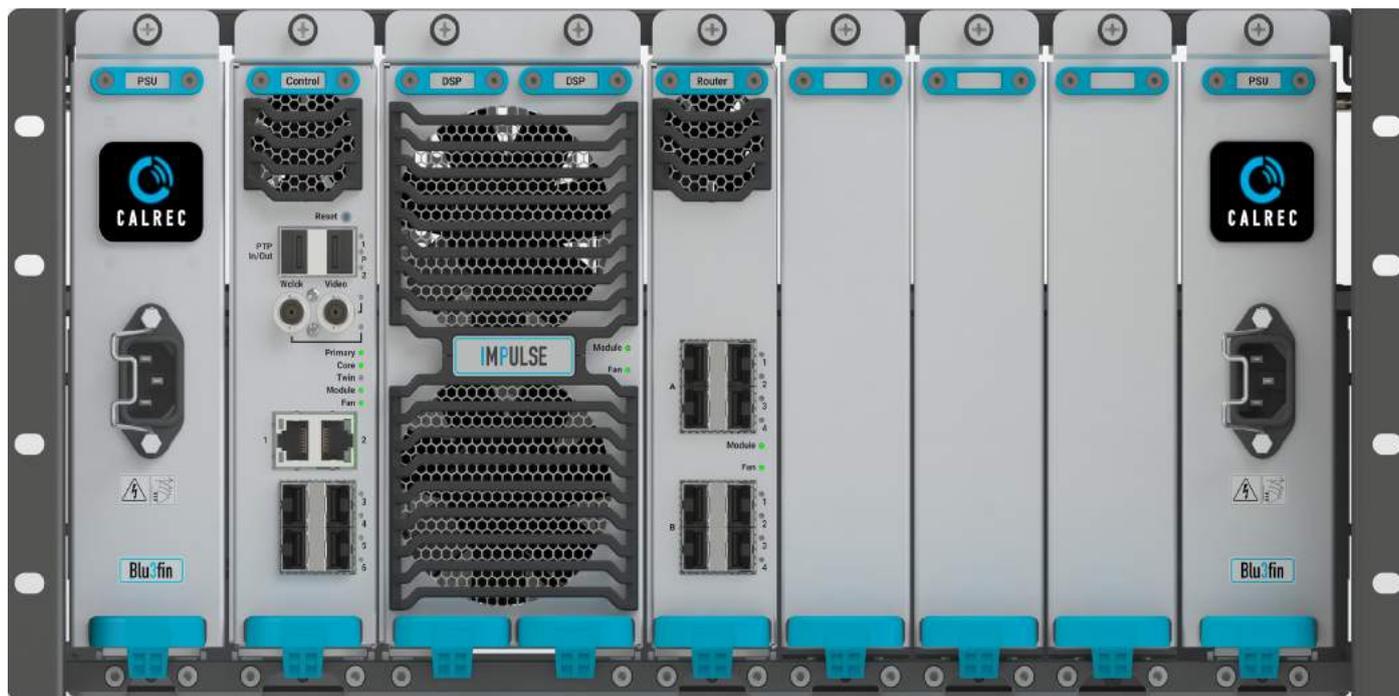
Using the next generation of Calrec's award-winning Bluefin DSP technology – Bluefin3 – ImPulse has the most powerful DSP engine on the planet and is offered in eight different user-upgradable DSP packs. ImPulse allows up to four independent DSP mix engines and control systems to run independently on a single core at the same time. It offers a cost-effective back end for multiple-mixer environments, with scope for virtualisation.

- Additional main and group capacity allows immersive content to be produced
- Integrates with Calrec Assist web-UI
- Integrates with major broadcast control systems and production automation systems
- SW-P-08 remote control over router and cross-point switching
- Ember+
- CSCP (Calrec serial control protocol for production automated systems)
- Supports "Headless" operation – no surface required

ImPulse also provides 3D immersive path widths and panning for next generation audio applications. Height and 3D pan controls are provided, with built-in automatic downmixing.

- Contains next generation Bluefin3 DSP
- Supports 3D immersive path widths for next generation audio
- Immersive paths have additional height legs to produce a 3D soundfield
- Input channels, groups and mains support mono, stereo, 5.1, 5.1.2, 5.1.4, 6m 7.1, 7.1.2, 7.1.4 widths - monitoring and metering provided for immersive content

- Up to 2384 processing paths
- Native SMPTE 2110/AES67 connectivity with ST2022-7 redundant connections
- Built-in support for NMOS IS-04 advertisements & IS-05 connection managements
- Up to 4 router cards
- Max router capacity of 10,240 x 10,240
- Router cards can operate in 1 or 10Gbps mode
- Each ST2110 stream can pass between 1 to 80 audio channels
- High bandwidth utilisation
- Full hardware redundancy
- Redundant pairs of cores can be physically remote from each other
- Surface connectivity is via IP, so surfaces can be physically remote or connected over COTS networks



ImPulse1 core



UR6700

The ImPulse1 IP engine is a smaller, yet powerful cost-effective version of the industry-established ImPulse.

ImPulse1 features include a 1U enclosure with dual AC PSUs. Two cores for failover redundancy or optional non redundant single core are available. It runs a single mixer with SMPTE ST2110/AES67 connectivity and can be controlled by Argo surfaces, and/or Calrec Assist, web UI, a browser-based GUI, ideally suited to remote working or headless operation.

ImPulse1 is designed for single mixer applications and is offered with an all-new DSP license of 128 input channels without compromising its ST2110 capability. With a small overall form-factor of 2 x 1U unit, it's immediately attractive for compact installation sites, such as outside broadcast and fly pack applications, where space is at a premium. Furthermore, it doesn't compromise on features and DSP power with options ranging from 128 to 384 input channels and benefits from the DSP features from the larger, ImPulse core.

- Supports control from Argo Q and Argo S control surfaces via IP, so surfaces can be physically remote, connected over COTS networks and supplemented with Assist web UI for multi operator, remote or headless use
- Up to 672 processing paths
- 1U fully self-contained DSP core
- Native SMPTE ST2110/AES67 connectivity
- ST2110 connections can operate in 1 or 10Gbps mode
- ST2022-7 redundant connections
- Built-in support for NMOS IS-04 advertisements & IS-05 connection managements
- Max router capacity of 2,048 x 2,048
- Up to 512 ST2110 streams - each stream can pass between 1 to 80 audio channels
- High bandwidth utilisation
- Dual AC PSUs
- Dual core for failover redundancy that can be physically remote or optional non-redundant single core available

Type R core

Type R has a simple 2U core at its heart with integrated I/O resources to get you up and running immediately. A single core can power up to three independent mixing environments, with no sharing of DSP resources.

The Type R 2U Core provides:

- 4 x AES input ports
- 4 x AES output ports
- 8 x analogue mic/line with 48v phantom power indication
- 8 x analogue line level output
- 12 x GPI, 12 x GPO ports
- 2 x stereo headphone outputs with optional redundant AoIP boards
- Optional dual-core redundancy

UR6500



IP Gateway

SL6553: Single 256 Channels
SL6554: Dual 512 Channels



The broadcast industry is going through huge infrastructure changes, and much of the discussion is around the move from proprietary infrastructures, like Calrec's Hydra2, to IP networks.

There are pros and cons with either option – but broadcasters don't need to choose between the two. In fact, there are countless other options. Broadcasters need not choose one or the other.

Calrec is helping many broadcasters leverage their existing equipment to benefit from the efficiencies of an IP domain. Most broadcasters are still using proprietary systems where they have made major investments, but that doesn't mean they can't benefit from the efficiencies of IP at the same time.

Calrec's H2-IP Gateway provides an interface between a Hydra2 network and an AoIP network. This allows Calrec equipment to sit on an IP network, or Calrec equipment to sit on a proprietary Hydra2 network. Or any combination of the two.

It awards an extra control level that allows audio labels to be passed in both directions between the two networks along with control data.

This gives Hydra2 users the ability to control the gain of Calrec IP mic inputs, and IP users can control gain of Hydra2 mic inputs.

It is SMPTE 2110/AES67 compatible and expands Calrec's range of AoIP solutions.

The 1U gateway can pass either 256 or 512 channels of audio in each direction and multiple gateways can be used to increase capacity or to connect with multiple networks.

Join our growing certified Calrec community!

Speak to us about your in-person training needs or take advantage of our FREE online courses, IP whitepaper and IP primer.

Brio, Type R & Summa Audio Mixing Console Training

Our certified training series for Brio and Type R and Summa training videos are designed to get an operator up and running in minutes. They cover hardware overviews, I/O, routing channels, mix minus, bussing and monitoring – everything you need to get up and running. These short step-by-step training videos highlight the main features and help you set up these features on your audio console successfully.

IP Training

Our certified series of comprehensive IP training sessions will help you master or refresh your IP knowledge and covers everything a broadcast facility needs to know about IP, how it works and the effect it is having on our industry.

Dolby Atmos® Training

Dolby and Calrec make immersive mixing easy with their free certified training. With more live broadcasts taking advantage of immersive technology, Dolby and Calrec show how Calrec Brio's mix of features help keep your audience in the centre of your world.

IP Primer

The IP Primer builds up your knowledge of IP and will enable you to create reliable IP networks to meet the needs of your desired workflow without defining or compromising operations. This guide details the underlying technologies that are required to implement IP in its simplest and most complex forms.

IP Resilience Whitepaper

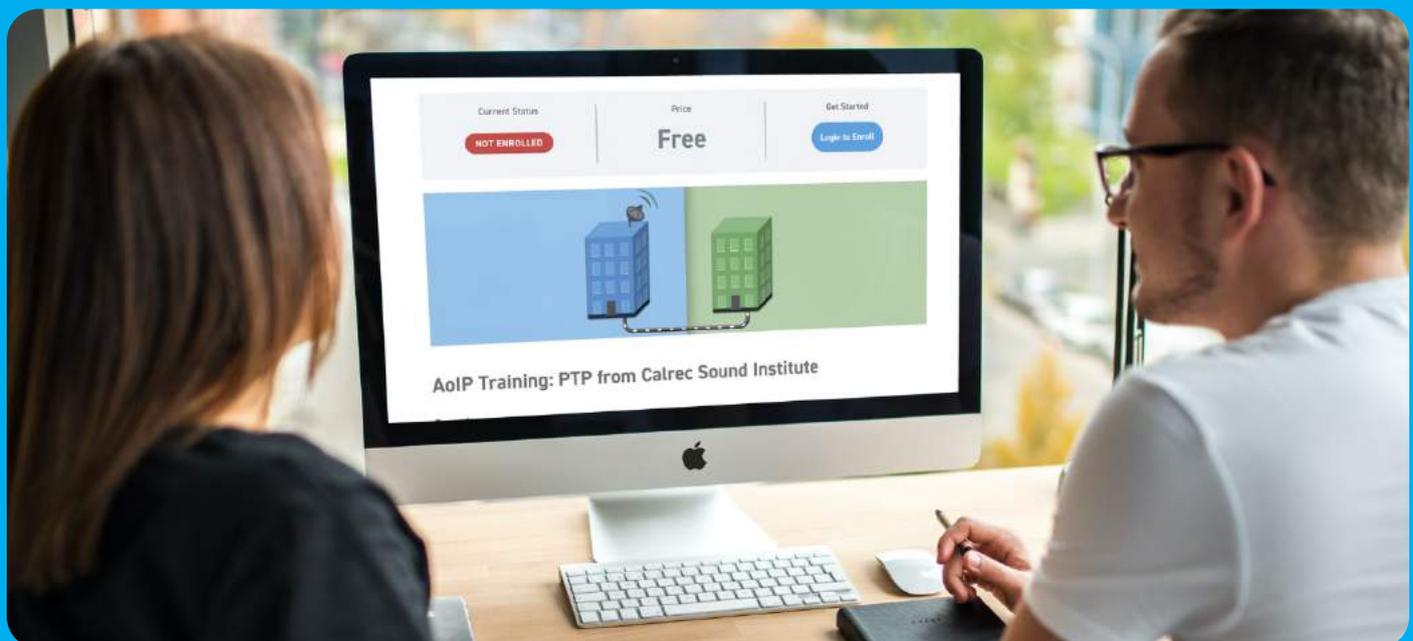
The paper looks at how to build resilient and robust IP network infrastructures and why Calrec is doubling down to provide fully hardware redundant IP solutions. It is beneficial to networking, technology and architect teams who require a thorough understanding of the operation and performance of Calrec's hardware redundancy model.

Complete Calrec Sound Institute's FREE certified training in three easy steps!

- Watch each video
- Answer a set of questions after watching each video
- Download and share your certificate

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calrec.com/calrec-sound-institute





Hydra2 consoles

	Apollo	Artemis Shine	Artemis Ray	Artemis Beam	Artemis Light	Summa	Brio36	Brio12
DSP Paths	1292	904	680	564	384	300	156	124**
Input Channels	1020	680	456	340	240	180	96	64**
Max Physical Faders	320	72	72	64	56	44	36	12
Max Main Output Buses	16					4		
Max Group Buses	48					8		
Track/IFB Output Buses	96	64			48	32	N/A	
Track/IFB Sends per Path	4					1	N/A	
Aux Output Buses	48	32			24	16	24	
Mix-Minus Outputs and Direct Outputs	512				256	188	64	48
Insert Send and Returns	256				128	252	132	100
EQ	6 band EQ on every processing path						4 band EQ on every processing path plus 2 filters	
Dynamics	2 x compressor/limiters and 1 x expander/gate per path						2 x compressor/limiters and 1 x expander/gate/ducker per path*	
Input Delay	256 of up to 2.73s						64 of up to 5.4s	48 of up to 5.4s
Path Delay	1020 of up to 2.73s	680 of up to 2.73s	456 of up to 2.73s	340 of up to 2.73s	240 of up to 2.73s	180 of up to 2.73s	64 of up to 5.4s	48 of up to 5.4s
Output Delay	256 of up to 2.73s			128 of up to 2.73s			64 of up to 5.4s	48 of up to 5.4s

Maximum sizes quoted

* No compressor/limiter 2 on auxes, no expander/gate/ducker on main 2

** Max available with DSP upgrade to 64 channels. Standard Brio12 has 48 input channels and 108 DSP paths

Apollo+ and Artemis+ consoles with ImPulse

Apollo+ and Artemis+ consoles with ImPulse					
DSP Paths	1458	1056	800	672	528
Input Channels**	1122	768	512	384	256
Max Physical Faders	320 (Apollo+) / 72 (Artemis+)				
Max Main Output Buses**	Up to 16 from main/group pool of 192 mono legs				Up to 16 from main/group pool of 96 mono legs
Max Group Buses**	Up to 48 from main/group pool of 192 mono legs				Up to 48 from main/group pool of 96 mono legs
Track/IFB Output Buses	Up to 96 from a pool of 96 mono legs	Up to 64 from a pool of 64 mono legs			Up to 48 from a pool of 48 mono legs
Track/IFB Sends per Path	4				
Aux Output Buses	Up to 48 from pool of 48 mono legs	Up to 32 from pool of 32 mono legs			
Mix-Minus Outputs and Direct Outputs	512				256
Insert Send and Returns	Pool of 256 mono legs				Pool of 128 mono legs
EQ	6 band parametric EQ/filters on every channel, track, aux, group and main				
Dynamics	2 x compressors/limiters + 1 x expander/gate/ducker + 2 x full bands of sidechain EQ per channel, track, aux, group and main***				
Input Delay	Up to 2.73s per input from pool of 256 mono legs		Up to 2.73s per input from pool of 128 mono legs		
Path Delay	Up to 2.73s per path				
Output Delay	Up to 2.73s per output from pool of 256 mono legs		Up to 2.73s per output from pool of 128 mono legs		

Maximum sizes quoted

** Each of which can be mono, stereo, 5.1, 5.1.2, 5.1.4, 7.1, 7.1.2 or 7.1.4 wide

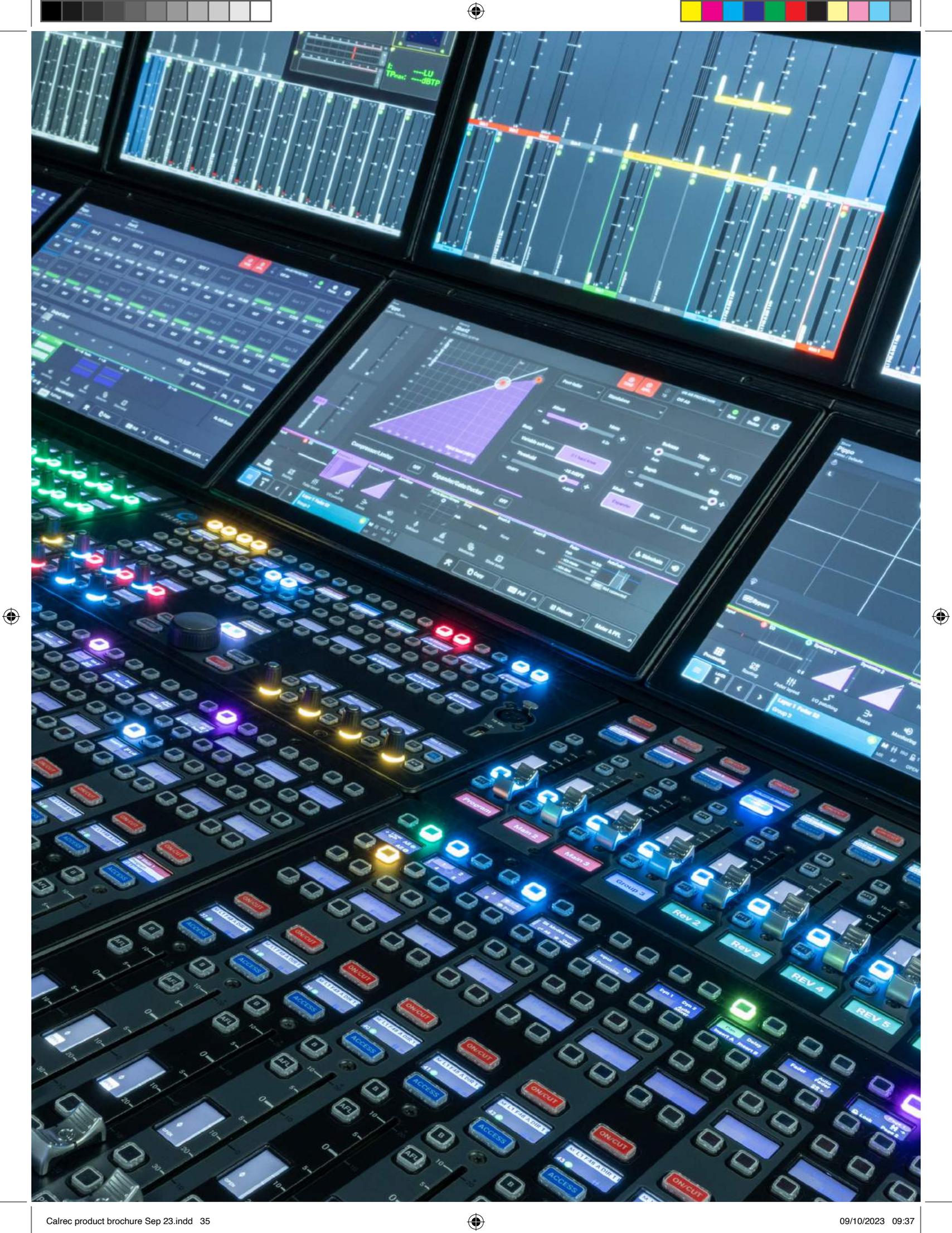
*** No ducker on mains



Argo consoles with ImPulse and ImPulse1

	ImPulse only						ImPulse and ImPulse1		
DSP Paths	2384	2128	1872	1458	1056	800	672	432	304**
Input Channels*	2048	1792	1536	1122	768	512	384	256	128**
Max Physical Faders	240								
Max Main Output Buses*	Up to 16 from main/group pool of 192 mono legs						Up to 16 from main/group pool of 96 mono legs		
Max Group Buses*	Up to 48 from main/group pool of 192 mono legs						Up to 48 from main/group pool of 96 mono legs		
Track/IFB Output Buses	Up to 96 from a pool of 96 mono legs			Up to 64 from a pool of 64 mono legs			Up to 48 from a pool of 48 mono legs		
Track/IFB Sends per Path	4								
Aux Output Buses	Up to 48 from pool of 48 mono legs			Up to 32 from pool of 32 mono legs					
Mix-Minus Outputs and Direct Outputs	1024		768		512		256	128	
Insert Send and Returns	1024		384		256		128		
EQ	6 band parametric on every channel, group, main, aux and track 6 & 12dB per octave slope options on any band operating with shelf response 12, 18d & 24B/octave slope options on bands 1 & 2 when set to HF/LF filter response								
Dynamics	2 x compressors/limiters + 1 x expander/gate/ducker + 2 x full bands of sidechain EQ per channel, track, aux, group and main*** Adjustable knee control on compressor thresholds								
Input Delay	Up to 5.4s per input from pool of 256 mono legs		Up to 5.4s per input from pool of 192 mono legs			Up to 5.4s per input from pool of 128 mono legs			
Output Delay									
Path Delay	Up to 5.4s per path (In addition to the input & output delay pools above, each and every input channel & bus has its own dedicated path delay available)								

Maximum sizes quoted
 * Each of which can be mono, stereo, 5.1, 5.1.2, 5.1.4, 7.1, 7.1.2 or 7.1.4 wide
 **ImPulse1 only
 *** No ducker on mains



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