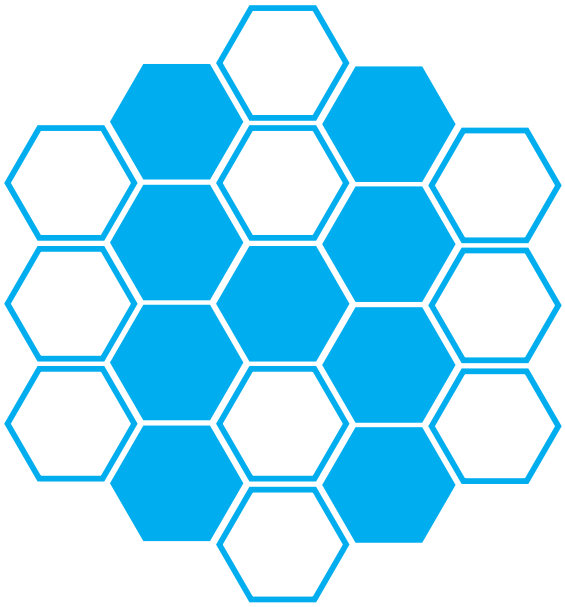


HYDRA2

The Hydra2 system is designed to provide seamless, scalable audio networking and resource sharing. It allows large numbers of audio inputs and outputs that may be physically remote, to be easily shared and controlled.

Each Hydra2 router can manage a huge number of routes thanks to the integral 8192^2 routing matrix, providing enough crosspoints for even the largest and most complex systems.

A single connection between Hydra2 clients (including routers and interface units) can carry 512 signals in both directions simultaneously at 48kHz, providing unmatched bandwidth per connection. This is more than enough for any single I/O unit but the real power comes in connecting routers together. Should more connection capacity be required, then simply make another connection between routers to double the connection bandwidth in both directions. Of course all connections are complemented with a secondary redundant connection, just in case.

A network's topology may be designed to meet the specific requirements of the broadcast facility, from simple console to console connections to more complex topologies involving centrally located routers and interface resources. Trunks of varying capacity can be created between different parts of the network to reflect anticipated demand. There's no manual tie-line management required as the control software transparently organizes all routing, including redundant connections.

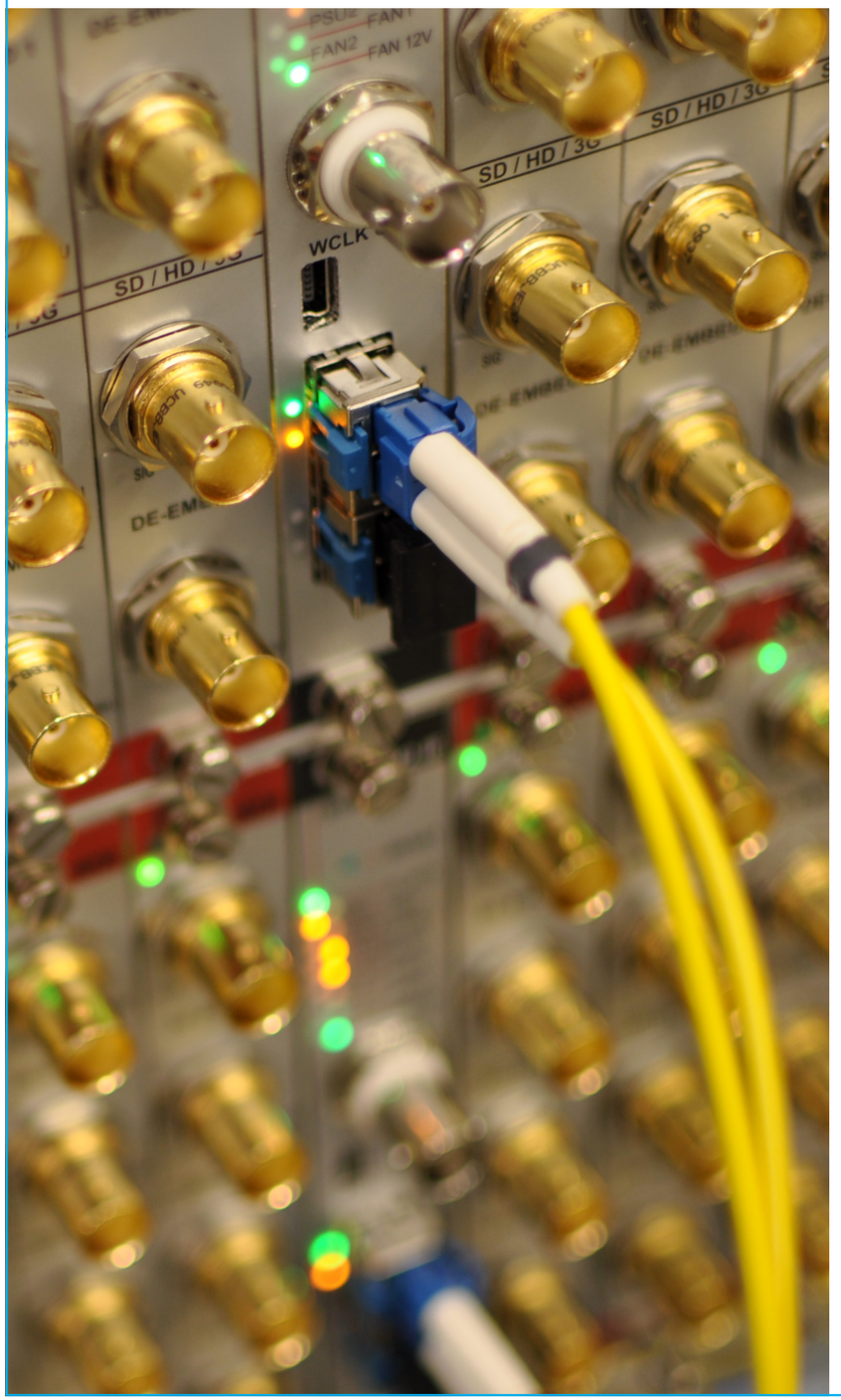
Hydra2's interconnections are made using either copper or fiber connections. Distances are limited only by the connection type and may run to many kilometers. The capacity of the network is vast, both in terms of the number of input and output ports and the switching capability.

In fact, Hydra2 is so powerful that Apollo and Artemis consoles both include a dedicated Hydra2 router in their racks which simultaneously manages all connections to and from the console and ensures that any connected resources are shared seamlessly across the network.

CALREC

Putting Sound in the Picture

Hydra2 has been designed for broadcast to build on the success of the previous Hydra network, making it a scalable and highly future-proof investment. Introduced in 2009 with the launch of the Apollo console, Hydra2 is a proven standalone development and a ground breaking product in its own right. Apollo and Artemis both contain Hydra2 routers at their core, enabling seamless sharing and control of all networked resources including I/O ports and console resources.



Resource Sharing

As Apollo and Artemis consoles are fundamentally integrated into the Hydra2 network, all resources and labels are shared between consoles (subject to rigorous access rights control) – 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 memory load. Resource sharing is a base requirement that has been built into Hydra2 from the very start.

The router network is dynamic – if a new audio interface or console is connected to the network, its presence is automatically detected and its resources are made available within seconds. This makes it very quick and easy to make ad hoc networks, such as connecting two mobile trucks together. It also makes it very easy to deploy extra resources as they are needed. Seconds after consoles and interface units are connected together, they behave as a network, without the need for any more hardware or software to be installed.

Hydra2 also carries and supports the sharing of non-audio data, in particular transportation of GPIOs.

Hydra2 provides 1-to-N routing, meaning that an input may be routed to any number of destinations without restriction. A given input may be connected to a channel on multiple consoles, and patched directly to one or more output ports on the network.

Audio Performance

Hydra2 features great audio performance in terms of latency, coherency and accessibility. The latency for a one hop patch across the network from AES3 input to AES3 output is only 230uS (or 11 sample periods at 48kHz).

Coherency is guaranteed between signals that take the same number of hops. For example, AES3 signals from boxes connected to the same router will be coherent. Full AES3 frames are also preserved across the network. This means that frames with embedded information, such as Riedel's Artist system, are passed intact.

Monitoring & Alarms

If any faults develop, alarms are generated and communicated via AWACS, Calrec's console alarm system. In addition, the Hydra2 network may generate SNMP warnings for integration into a LAN-based monitoring scheme. This comprehensive approach to the rapid notification of failures helps to make system maintenance more responsive.

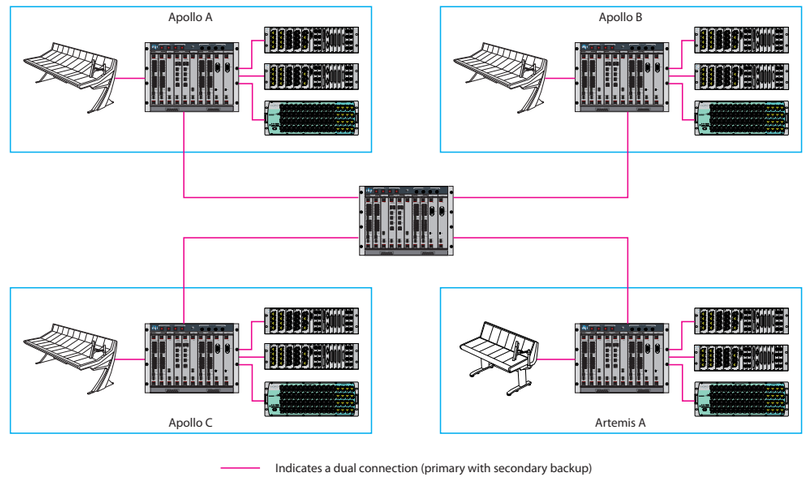
Show Portability

Calrec's powerful alias scheme ensures that any shows made with Calrec consoles can be seamlessly moved between control rooms. Even if a show has to move between studio floors, once the sources have been plugged in to different interfaces, simply selecting the correct alias files ensures that the audio is present where it should be on the console and elsewhere on the network without extensive manual repatching.

Redundancy

As with all Calrec products, reliability is a paramount consideration. Decades of experience underpin our uncompromising approach to power distribution, heat management and robust physical design – the cornerstones of Calrec's legendary product reliability.

In the unlikely event of a fault, a redundancy scheme automatically deploys backup hardware to quickly restore operation. All critical components can have their own hot (i.e. powered-up and ready to operate) backup and all network interconnections may be duplicated. In fact, where backup infrastructure exists, secondary routes are created at the same time as primary routes, to speed the process of switching over.



Each connection between Hydra2 units can simultaneously carry 512 signals in both directions at 48kHz. The real power comes in connecting routers together. Should more connection capacity be required, then simply make another connection between routers to double the connection bandwidth in both directions.

Apollo and Artemis consoles provide deeply integrated control over any Hydra2 network. H2O provides extended configuration and monitoring, and support for third party protocols provides increased integration and flexibility.

Interface Units

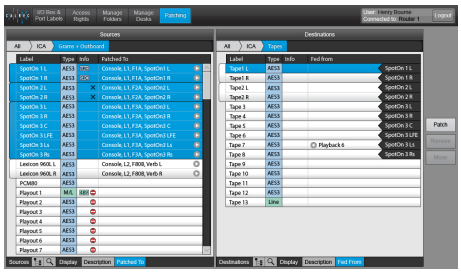
There are a growing range of Hydra2 interface units available. A number of fixed format units are available in various configurations including:

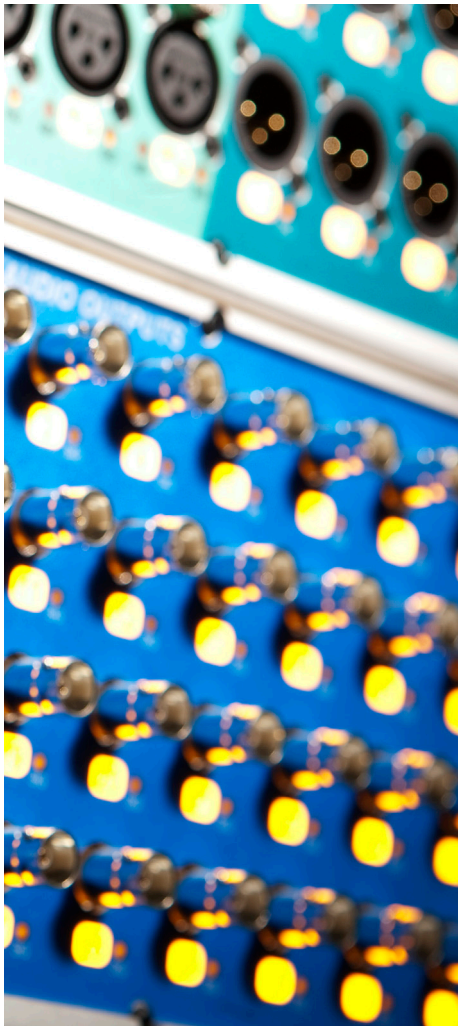
- 12 Mic/Line In, 4 Line Out (XLR)
- 24 Mic/Line In, 8 Line Out (XLR)
- 48 Mic/Line In, 16 Line Out (XLR)
- 32 Mic/Line In, 32 Line Out (EDAC)
- 16 AES3 In, 16 AES3 Out (BNC)
- 32 AES3 In, 32 AES3 Out (BNC)
- Dual MADI Interfaces (BNC, Single mode Fiber SC, Multi mode Fiber SC/ST)

A modular Stagebox is also available allowing flexible configuration of interfaces and extremely high port density. Modules include:

- 4 x Mic/Line In (XLR)
- 8 x Line In (DB37)
- 4 x Line Out (XLR)
- 8 x Line Out (DB37)
- 4 x AES3 In (BNC)
- 4 x AES3 Out (BNC)
- 8 x AES3 In/Out (2 x DB25)
- Dual SDI De-embedder (BNC)
- Dual SDI De-embedder with Dolby E Decoding (BNC)
- Dual SDI Embedder (BNC)
- 8 x GPI & 8 x C/O GPO (DB50)

All Hydra2 interface units feature dual redundant power supplies and Hydra2 connections for complete confidence in operation.





H2O

H2O is built on web technologies allowing it to run in the browser of any connected Windows, Mac OS X or Linux computer. H2O provides a powerful and convenient method of monitoring and controlling a Hydra2 network without installing any extra software. Simply connect a computer to a console or standalone router and direct a browser to H2O.

H2O allows centralized naming of I/O resources which propagate throughout the network to any connected clients, although individual consoles may still overwrite these labels with their own custom labelling. Multidimensional folder structures can also be created for powerful management and navigation of sources and destinations

H2O users and consoles on a Hydra2 network can all be subject to rigorous access rights control. Clients can be granted or denied access to complete studios or control rooms right down to individual ports.

Advanced patching screens provide users with increased clarity when making new routes or viewing existing patches.

Third Party Integration

Hydra2 supports the SW-P-08 protocol allowing patching to be controlled from third party routers or broadcast control systems. Hydra2 may also be connected to controllers using the EMBER protocol. Currently providing access to port names, future support is planned for loading of desk memories and alias files, controlling the insertion of Dolby metadata in SDI embedders (as per SMPTE 2020), mic preamp gain and phantom power switching.

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