

IP I/O for K-Frame Video Processing Engine

SMPTE 2022-6 Uncompressed IP & 4K over 1-Wire TICO-compressed IP



Simplifying the transition to video-over-IP.

The K-Frame video processing engine for the Karrera and Kayenne Video Production Center switchers from Grass Valley, a Belden Brand, offers outstanding format flexibility, with easy “mixing & matching” of IP and SDI formats for a phased migration to video-over-IP. You can mix 4K over 1-wire TICO-compressed IP with 1080p SDI, and SMPTE 2022-6 uncompressed IP with HD-SDI.

This format flexibility simplifies operations in mixed IP/SDI environments, or when a truck is used for IP-oriented events and SDI-oriented events on different days. This approach also allows the K-Frame video processing engine to be scaled readily from a small number of IP sources at the outset to a more IP-oriented system as a facility transitions to video-over-IP.

By using 4K over 1-wire TICO-compressed IP, live production is streamlined with fewer cables and less weight, and the installation is also faster than with the established 4K over 4-wire approach. This means faster turnarounds, and lower operating costs.

This IP connectivity is provided by the K-FRM-IO-10GE IP I/O board, which fits in the existing K-Frame video processing engine to provide up to 32 bidirectional IP signals (standard frame), or 16 bidirectional signals with the compact frame. These IP boards operate alongside existing SDI I/O boards to offer mixed IP/SDI connectivity.

Each K-Frame IP I/O module provides two SFP connectors, each of which is 10 GigE for supporting

two 3 Gb/s signals, with two in and two out. Each module delivers a four-by-four bidirectional path, with each module acting as four HD-SDI (1.5 Gb/s) inputs and four HD-SDI (1.5 Gb/s) outputs.

The two 10 GigE connections provide the 4K over 1-wire compressed IP I/O, as well as SMPTE 2022-6 uncompressed IP I/O. The board is also equipped with two BNC I/O connectors to allow 4K over 1-wire TICO over 3 Gb/s SDI, and 4K uncompressed over 12 Gb/s SDI (available with a future firmware upgrade).

The 4K over 1-wire capability uses TICO light compression to allow 4K signals to pass using a single 10 GigE SFP connection. TICO is a lightweight 4:1 compression format that's ideal for production applications; it's visually lossless even after multiple CODEC passes, and it also offers low latency.

The IP board's use of TICO compression introduces two sample interleave processing to the K-Frame. This offers you an easier method to incorporate standard production wipes to events, while allowing the use of standard 1080p HD signals within those same shows. It is not possible to combine 4K over 1-wire (TICO) signals (interleave) and 4K four-quadrant signals.

The combination of SMPTE 2022-6 and 4K over 1-wire (TICO) IP I/O offers excellent interoperability with Grass Valley's wide range of IP-enabled products in its “Glass-to-Glass IP” solution, as well as many other third-party IP products.

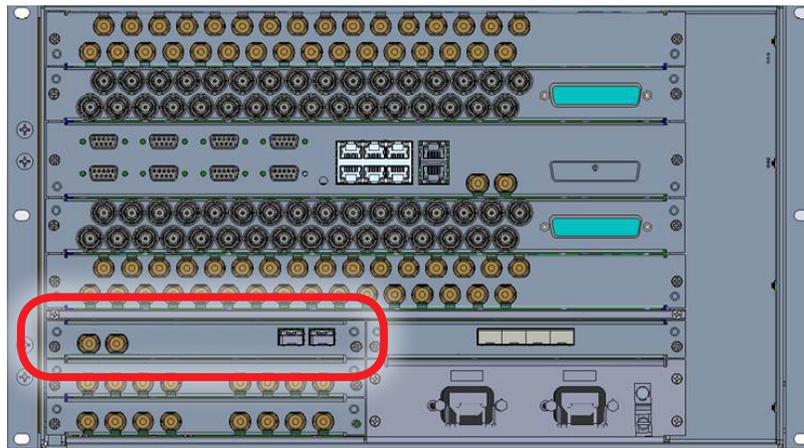
KEY FEATURES

- The K-FRM-IO-10GE IP I/O board for the K-Frame video processing engine offers video-over-IP connectivity for Kayenne and Karrera production switchers, using either uncompressed SMPTE 2022-6 or 4K over 1-wire compressed IP
- IP I/O boards provide up to 32 bidirectional IP signals (standard frame), or 16 bidirectional signals with the compact frame. These IP boards operate alongside existing SDI I/O boards to offer mixed IP/SDI connectivity
- 4K over 1-wire compressed IP signals can be mixed with 1080p SDI, and SMPTE 2022-6 uncompressed IP signals can be mixed with HD-SDI signals
- The K-FRM-IO-10GE IP I/O board is equipped with two 10 GigE connections which provide the 4K over 1-wire compressed IP I/O, as well as SMPTE 2022-6 uncompressed IP I/O. The board is also equipped with two BNC I/O connectors to allow 4K TICO over 3 Gb/s SDI, and 4K uncompressed over 12 Gb/s SDI (available with a future firmware upgrade)
- Each K-Frame IP I/O module provides two SFP connectors, and each connector is 10 GigE for supporting two 3 Gb/s signals, with two in and two out. Each module delivers a four-by-four bidirectional path, with each module acting as four HD-SDI (1.5 Gb/s) inputs and four HD-SDI (1.5 Gb/s) outputs
- The 4K over 1-wire capability uses TICO light compression to allow 4K signals to pass using a single 10 GigE SFP connection
- TICO compression introduces two sample interleave processing to the K-Frame, which offers an easier method to incorporate standard production wipes to events, while allowing the use of standard 1080p HD signals within those same shows

ORDERING

K-FRM-IO-10GE K-Frame 10 GigE IP Module

The K-FRAME Input/Output IP Module adds 4x4 bidirectional signals on two SFP connectors, using SMPTE 2022-6. Each connector is 10 GigE supporting 2 in/2 out. The module can be part of a mixture of modules types loaded in any K-Frame.



The K-Frame video processing engine behind the Karrera and Kayenne production switchers can accept SMPTE 2022-6 uncompressed IP and 4K over 1-wire TICO-compressed IP, as well as SDI I/O boards, to “mix and match” IP and SDI based upon your needs.

Glass-to-Glass IP Solution for Live Production

The K-Frame production switcher is at the heart of Grass Valley's Glass-to-Glass IP solution, which delivers a fully IP-enabled broadcast facility. This solution is called "Glass-to-Glass" because it stretches all the way from the camera to playout monitoring; it's a true end-to-end solution. This highly integrated IP system delivers more flexible, more streamlined & scalable live production infrastructures — ready for 4K and beyond.

In the diagram below, a Grass Valley production switcher is used within an IP live production studio, with signals from camera and servers fed via a COTS IP switch and a GV Node IP processing node, which performs vertically accurate switching and signal monitoring. The IP switching infrastructure is controlled by GV Convergent SDN.

