

IQUCP50

Universal Compute Processor for 50 GbE IP Systems

The IQUCP50 is a user-configurable multichannel video-over-IP transceiver developed for use within low latency and high bandwidth Ethernet IP networks. Using RTP VSF TR-03 (SMPTE ST 2110), TR-04 and SMPTE ST 2022-6 encoding and encapsulation schemes, along with clause 74 FEC, enables the IQUCP50 to encode or decode up to 16 SDI signals and transport them over redundant 50 GbE links (SMPTE ST 2022-7) with either dual or single port options.

To enable hardware processing flexibility, IQUCP50 has a variety of Software Defined Cores (SDCs) available that can be purchased and loaded as operational needs demand. SDCs can be installed via a licensing mechanism and include; essence processing for SDI to IP gateway type applications, signal monitoring for multiviewer style applications, network processing for IP transcoding and NAT firewall applications, and signal processing for broadcast quality conversion and processing requirements.

With its essence processing, SDC IQUCP50 provides frame synchronized SDI outputs along with both uncompressed and compressed (using SMPTE ST 2042 — VC2) modes of IP operation. Encapsulation of signals in an SMPTE ST 2022-6 transport stream is also catered for.

IQUCP50 is fully compatible with Grass Valley's new broadcast-centric IP routing and network management solution designed to migrate broadcasters from a traditional baseband routing and control environment to new hybrid SDI and IP workflows.

Why should you choose this module?

- Re-purpose existing hardware modules for alternate tasks as network needs and requirements evolve
- Using a 50 GbE transport allows many more signals to be sent over a single fiber, thereby reducing the required link count and minimizing dark fiber leasing cost
- Generate signal transport efficiency by running multiple SDI signals over a single Ethernet link and provide the link between existing SDI equipment and future IP network architectures
- Using IGMPv3 source specific multicast allows fast configuration of network routes and provides the basis for clean switching at the destination unit
- Full RollCall and SNMP compatibility allows easy integration with Grass Valley or third party network management systems, providing an all-inclusive monitoring and control solution

KEY FEATURES

- Supports configuration of Ethernet links for maximum signal transport using both SFPs or (for dual link mode) to provide link redundancy as per SMPTE ST 2022-7, and when operating as a receiver will dynamically adapt to any stream presented to it
- Supports unicast as well as IGMPv3 source specific multicast, allowing point-to-point operation or transmission in multicast groups, and forward error correction with clause 74 (Base-R) FEC
- Standards supported:
 - 3G-SDI to SMPTE ST 424/425 level A compatible
 - HD-SDI to SMPTE ST 292/274/296
 - SD-SDI to SMPTE ST 259-C
 - 50G Ethernet to IEEE 802.3
- RollCall control and monitoring compatible with standard logging and reporting features

Essence Processing (EP) Features

- Handles up to 16 SDI signals over dual 50 GbE IP links with dual and single port rear panel options
- Multiple transport types available for each SDI input including:
 - Compressed IP transport using SMPTE ST 2042 (VC2) low-latency high-quality encoding profile
 - Uncompressed video transport using either VSF TR-03 (SMPTE ST 2110) and TR-04 RTP, or SMPTE ST 2022-6 encapsulation
 - PCM audio using TR-03 & AES67
 - SMPTE ST 2110-40 metadata support via IETF standard "RTP Payload for Ancillary Data"

- Supports frame synchronized SDI inputs and outputs, with audio rate adaption, referenced to either IEEE-1588v2 (PTP) network timing (compliant with SMPTE ST 2059-2) or via the IQH3B or IQH4B frame's analog reference bus for blackburst/tri-level syncs
- Includes 4K UHD quad link mode for 3G SQD or 2SI signal transport
- Low delay mode and Independent H & V offset available for each channel along with up to two frames of video delay, and up to 255 ms of audio delay

Signal Monitoring (SM) Features

- Signal monitoring license with 12x4 multiviewer functionality

SPECIFICATIONS

Inputs and Outputs

Signal Inputs/Outputs

SDI: 16x bidirectional, see configuration table

Electrical:

3 Gb/s SDI, SMPTE ST 424

1.5 Gb/s HD-SDI, SMPTE ST 292

270 Mb/s SDI, SMPTE ST 259-C

Connector/format: HD-BNC/75Ω panel jack on standard connector panel

Ethernet Signal

SFP+ Optical: 2x 25G Ethernet

Conforms to: IEEE 802.3cd – 50 Gigabit Ethernet over fiber

SFP+ connected cable: 2x 25G Ethernet

Conforms to: IEEE 802.3 – 50 Gigabit Ethernet over twinaxial cables

Note: SFP type must be ordered in addition to the module.

Controls

Indicators

Power: OK (Green)

CPU: OK (Flashing)

Content Status

Summary:

OK (Green)

Warning (Yellow)

Error (Red)

Electrical

Standards supported: 1125 (1080)/50p (A), 1125 (1080)/59p (A), 750 (720)/50p, 750 (720)/59p, 1125 (1080)/25i, 1125 (1080)/29i, 625 (576)/25i, 525 (480)/29i

Power Consumption

Module Power Consumption: 45.5 PR (B Frames)

Essence Processing SDI to IP Configurations:

IQUCP50 — 50 GbE	Config 1	Config 2	Config 3	Config 4	Config 5
SDI In <> Out	16 > 0	0 > 16	12 > 4	4 > 12	8 <> 8
Codec Support	SMPTE ST 2022-6 TR-03 (2110) TR-04	SMPTE ST 2022-6 TR-03 (2110) TR-04	SMPTE ST 2022-6 TR-03 (2110) TR-04	SMPTE ST 2022-6 TR-03 (2110) TR-04	SMPTE ST 2022-6 TR-03 (2110) TR-04

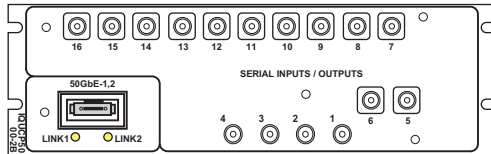
IQUCP50 — 50 GbE	Config 6	Config 7	Config 8
SDI In <> Out	4 > 4	8 > 0	0 > 8
Codec Support	VC2	VC2	VC2

ORDERING

Order Codes for IQH Enclosures*

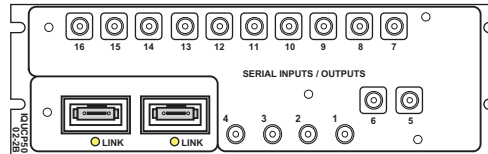
IQUCP5000-2B3

Universal Compute Processor. 16 SDI I/O, 2 50 GbE I/O on single 100 GbE QSFP connector. Suitable for IQH4B frames.



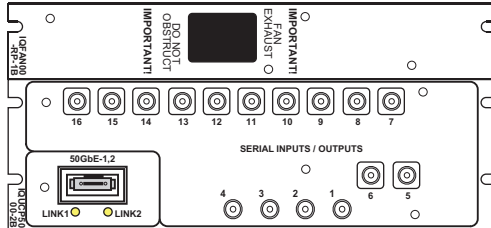
IQUCP5002-2B3

Universal Compute Processor. 16 SDI I/O, 2 50 GbE I/O on QSFP connectors. Suitable for IQH4B frames.



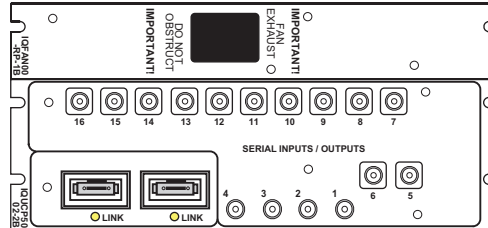
IQUCP5001-3B3

Universal Compute Processor. 16 SDI I/O, 2 50 GbE I/O on single 100 GbE QSFP connector. Includes IQFAN rear panel for additional cooling in IQH3B frame.



IQUCP5003-3B3

Universal Compute Processor. 16 SDI I/O, 2 50 GbE I/O on QSFP connectors. Includes IQFAN rear panel for additional cooling in IQH3B frame.



Software Defined Core Licenses

IQUCP-EP

Essence processing license for SDI to/from IP with synchronization and audio rate adaption

IQUCP-MV

Signal monitoring license, includes 12x4 multiviewer functionality

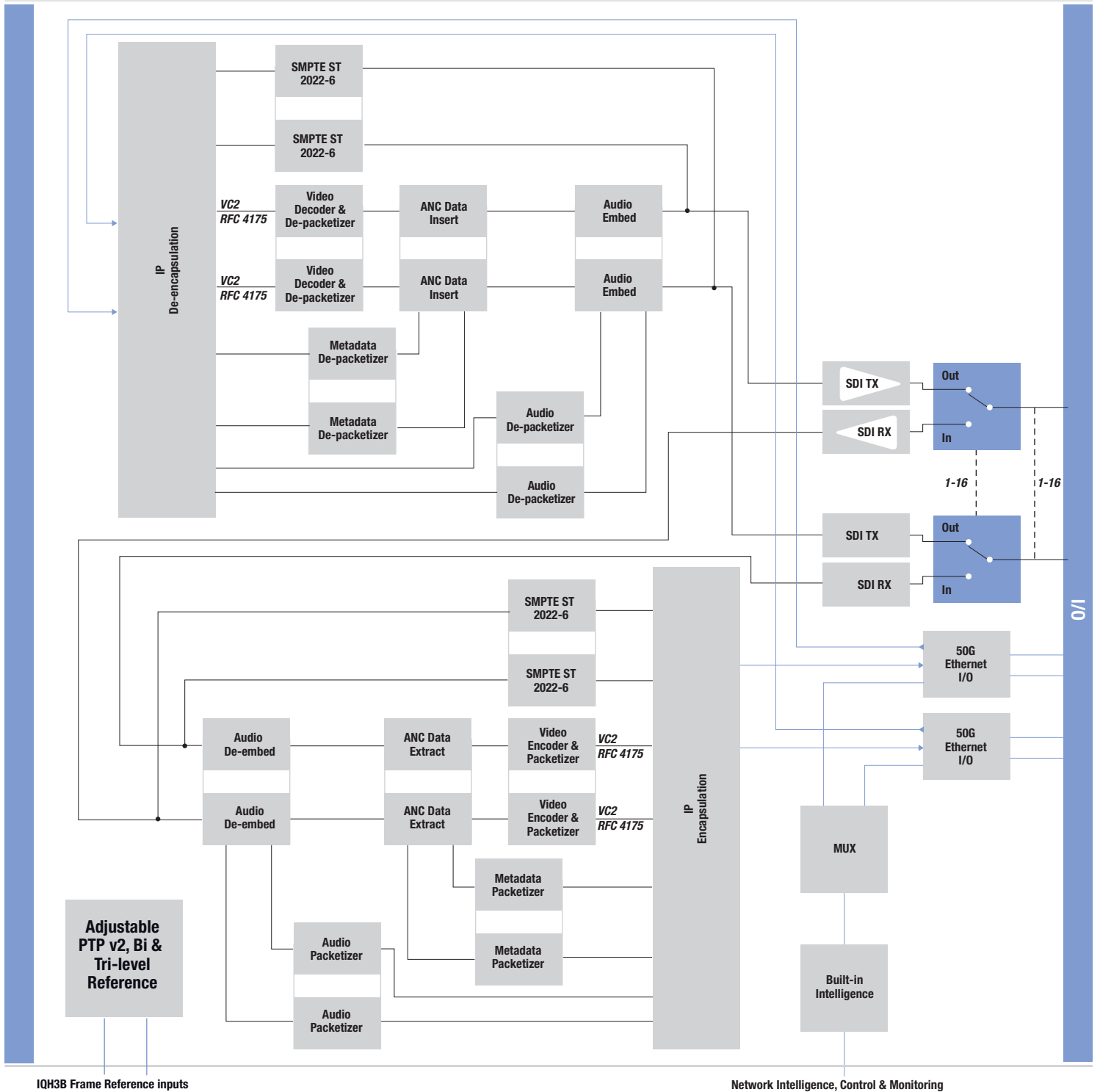
SFP Options

FCQ-100GE-SR4

100GBASE-SR short range SFP for MMF

Note: QSFP type must be ordered in addition to the module.

* Although IQ modules are interchangeable between enclosures, their rear panels are enclosure specific. Order codes 'A' or 'B' may be used when installing modules in a 'B' enclosure. However, order code 'A' must be used when installing modules in an 'A' enclosure. Please take time to ensure that the compatible order code is selected to match the chosen enclosure.



Block Diagram for IQUCP50 with essence processing SDC.

GVB-2-0690A-EN-DS



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