BRIDGE TECHNOLOGIES™

VB440 APPLIANCE

VB440

IP PROBE FOR UNCOMPRESSED VIDEO

The VB440 is a comprehensive set of production tools contained in a single instrument, designed to give technical and creative professionals the insight needed to complete tasks on a fixed, remote and distributed basis.

Providing the right tool at the right time, the VB440 incorporates packet analysis, content visualisation, scopes, audio and deep engineering. VB440 uses monitoring and analytical data to generate visual information that drives in-the-moment decision making: condensing a range of IP production functions into one appliance, accessible from any HTML5 browser, anywhere in the world.

The VB440 gives at-a-glance insight into the full production environment through the intuitive InstrumentView, providing analysis of SD, HD, HD HDR, UHD, 4K and 4K HDR, compressed and uncompressed (including JPEG XS), along with full ST 2022-7 redundancy monitoring. By turning these monitoring metrics into usable information, the VB440 helps to inform production decisions through the intuitive display of deep engineering elements, packet analytics, content visualisation, and a range of colourmetry and audio tools.

Providing browser-based analytics access to 8 simultaneous users anywhere in the world, with the VB440 supporting interface speeds from 10, 25, 40, 50 and up to 100 Gigabit on dual interfaces, even the largest of media networks can be accommodated.

And with simple tab-based access to network, packetflow, video, audio and auxiliary, creatives and engineers can access production metrics in real time with next to no latency.

The VB440 is designed around the concept of a central appliance, situated together with the IP-switched infrastructure in order to access all signals travelling on the network system. With up to dual 100Gigabit Ethernet connectivity, the VB440 can be connected directly to a spine/leaf switched network and can therefore achieve both continuous and momentary monitoring and analysis of individual signals for any individual users of the system.

Because user access is achieved across standard HTTPS and web browsers (and even across public internet, where network capacity is adequate), user location is separated from the core infrastructure location; providing unprecedented flexibility and thus a benefit that cannot be underestimated in the field of remote and distributed production. It achieves the work of a whole rack, whilst taking up only

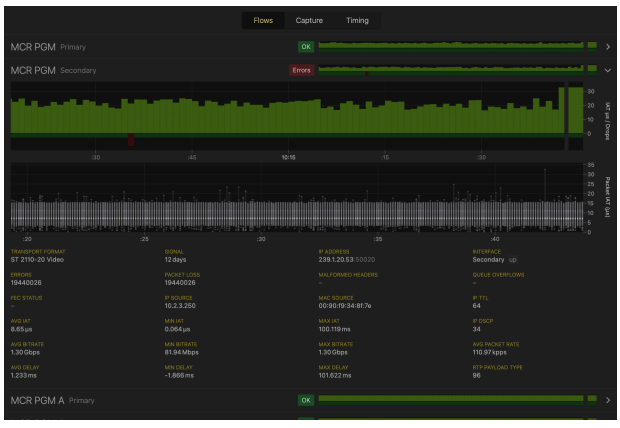
one rack slot, and minimal energy draw.

Instrument View

At the heart of the VB440 lies the Instrument View, giving at-a-click access to network performance and packet flow monitoring, as well as scope and meter visualisations of audio and video. Instrument View turns complex data into simple, intuitive information that directly informs production decisions in-the-moment.

Network Analytics

Ensure seamless network performance and detect errors at-a-glance with simple visualisations of complex data. Covered within the Status, Network and Packet Flow tabs of the InstrumentView, complex packet and timing behaviour can be intuitively understood quickly through the patented MediaWindow; a single, composite graph that displays packet loss and jitter, using waterflow to represent both current and historical data that allows efficient troubleshooting and error detection, along with long-term, strategic decision making. Media metadata, deep packet analytics, signal integrity, redundancy relationships, PTP clock sync, error detection: every metric network engineers need to ensure the smooth running of their studio.



Network Flows

The flow view is intended to provide more extensive information by drilling down into each individual flow. Selecting the desired flow extends the window to see the current status, with the new window containing the MediaWindow IAT graph, packet behaiviour and other detailed and useful flow measurements.

ST 2022-7 Redundant Flows

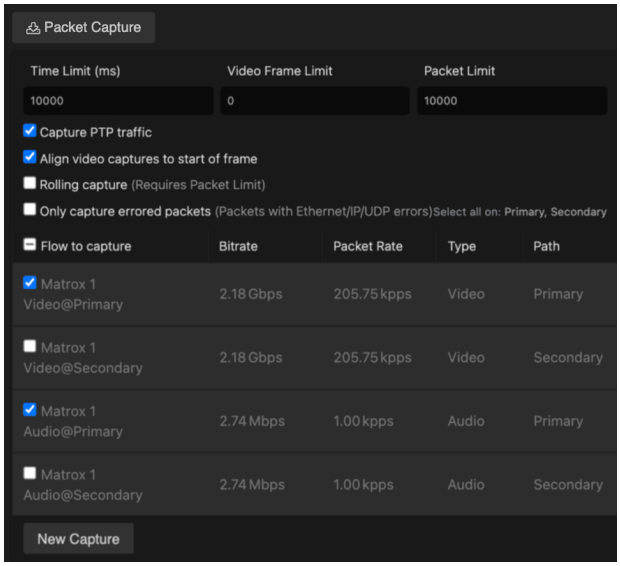
This intuitive real-time readout shows transmission jitter and the time differential that exists between primary and redundancy channels, providing network engineers with the information needed to fine tune receivers and thus accommodate the buffer needed to achieve perfect switchover when required. Display of video, audio and ancillary packets are all selectable through quick-access tabs.

Security

The VB440 uses best practices from the IT industry to ensure continued operational stability and the highest level of protection against attack. It makes use of HTTPS to secure and encrypt the communications channels, thus practically eliminating the possibility of man-in-the-middle attack. In addition, server certificates and signed code updates are employed to ensure only valid software is deployed on the VB440 via the update server. This provides production facilities and outside broadcasters with the ability to architect and use remote production capabilities with confidence and ease.

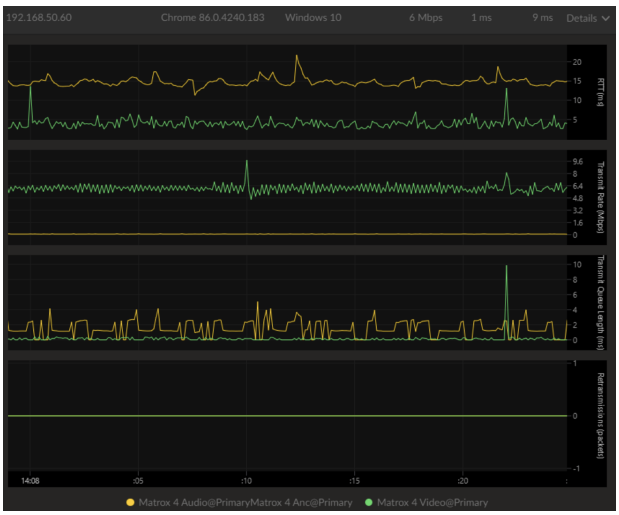
PCAP Packet Capture

Designed to help engineers diagnose and communicate troubleshooting issues to engineers up and down the broadcast chain - including equipment vendors, Packet Capture gives a PCAP snapshot of all the streams of a service to give engineers direct, data-based insight into the problems occurring. The packet capture feature is fully customisable to accommodate rolling capture.



Timing Insight

The VB440 provides three different areas of timing insight to validate that transmitters are behaving as expected. The first two reference the RTP timestamp; with Path Display showing variation between RTP and arrival time, and Align Offset indicating the time difference between RTP and alignment point. In addition, the FTP Margin shows the difference between arrival and first packet read. Flow in the VRX and comparison between average and maximum packets to give insight into network burstiness are also provided. Combined, these visual insights into timing behaviour help engineers to ensure that all data remains in conformance with ST 2110 parameters and specifications.



PTP Status

Keeping tabs on clock sources in the network is vital for successful operation: without a proper timebase, separate media sources as defined in ST 2110 would quickly lose sync.

The VB440 gives a complete overview across all available clock sources adhering to ST 2059-2 on the network, including their accuracy, identity, time delta from current selected source, network domain and vendor information.

This overview is vital in securing the correct clock source presence on both the Primary and Secondary networks in the presence of various equipment that may announce itself as a Grand Master.

PTP overview also gives network status for the individual interfaces and the status of utilisation and time lock.

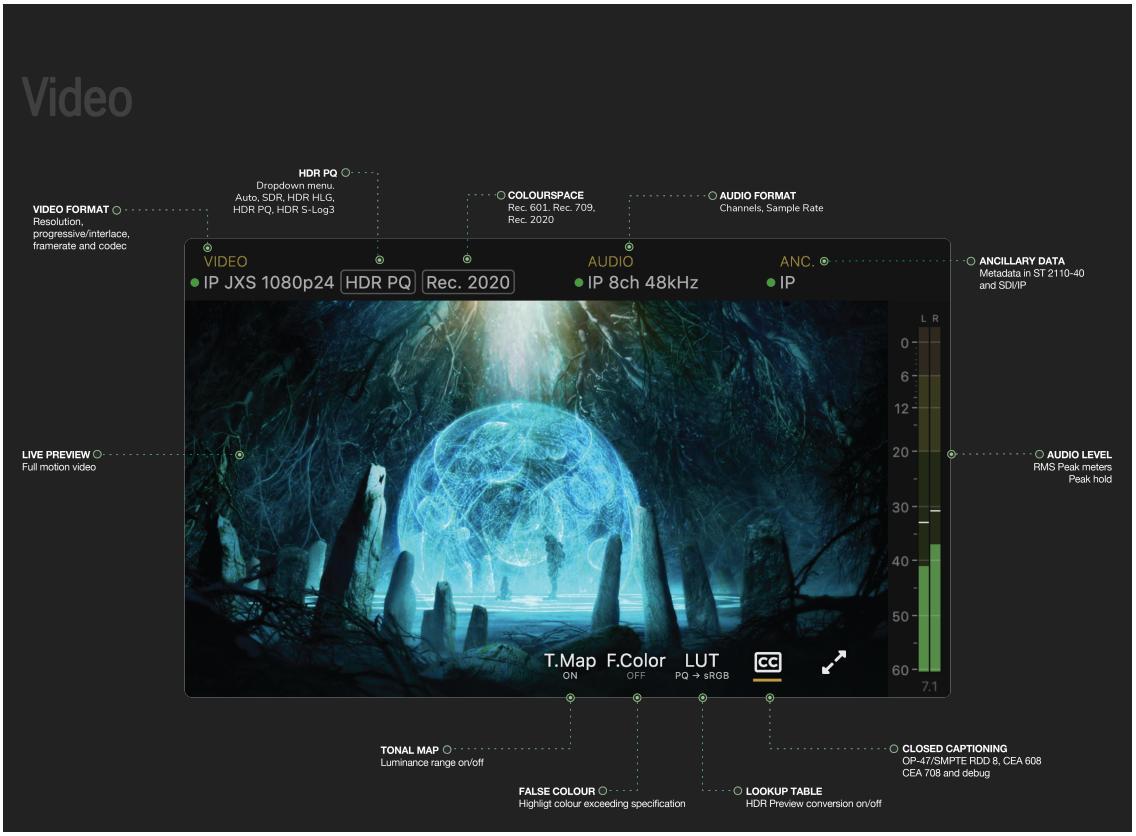
With the VB440 accurately synchronised to the same Grand Master or Border Clock as other sources, absolute path-delay can be calculated and displayed for the services chosen and any deviation is displayed in the intuitive path-delay graph for the individual flows inside a service.

PTP is provided with ST 2059-2 clock analysis, clock source detection/listing and clock accuracy and class, providing troubleshooting and continuous monitoring of this critical infrastructure in a production network – including accurate path-delay for individual flows.

Video Analysis

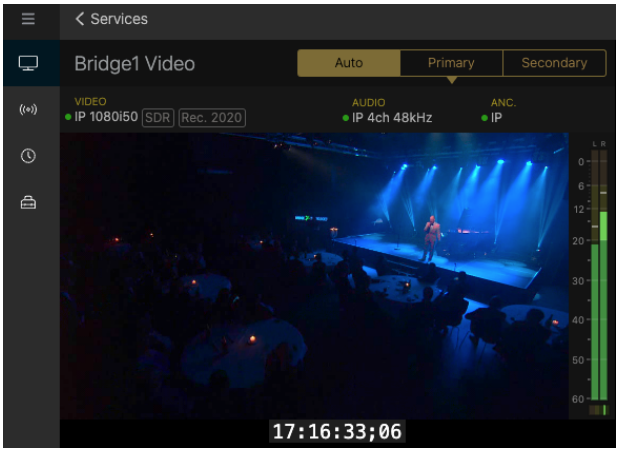
Allowing camera painters, colourists and other image-based creatives to condense their workspace into a single browser, the VB440 eliminates the need for space-consuming specialist equipment, whilst providing all of the functionalities needed to fine tune images, both live and in post-production. Access a full range of colorimetry tools, including waveform, vectorscope, diamond view and chromacity. Preview your image in HDR even on an SDR screen, scale your instruments to match the size of your available screen, and fine tune associated measures. The need for fixed equipment is eliminated with the VB440, because it places monitoring scopes and displays in a single browser space and grants creatives unlimited flexibility in the way they organise that workspace, reducing

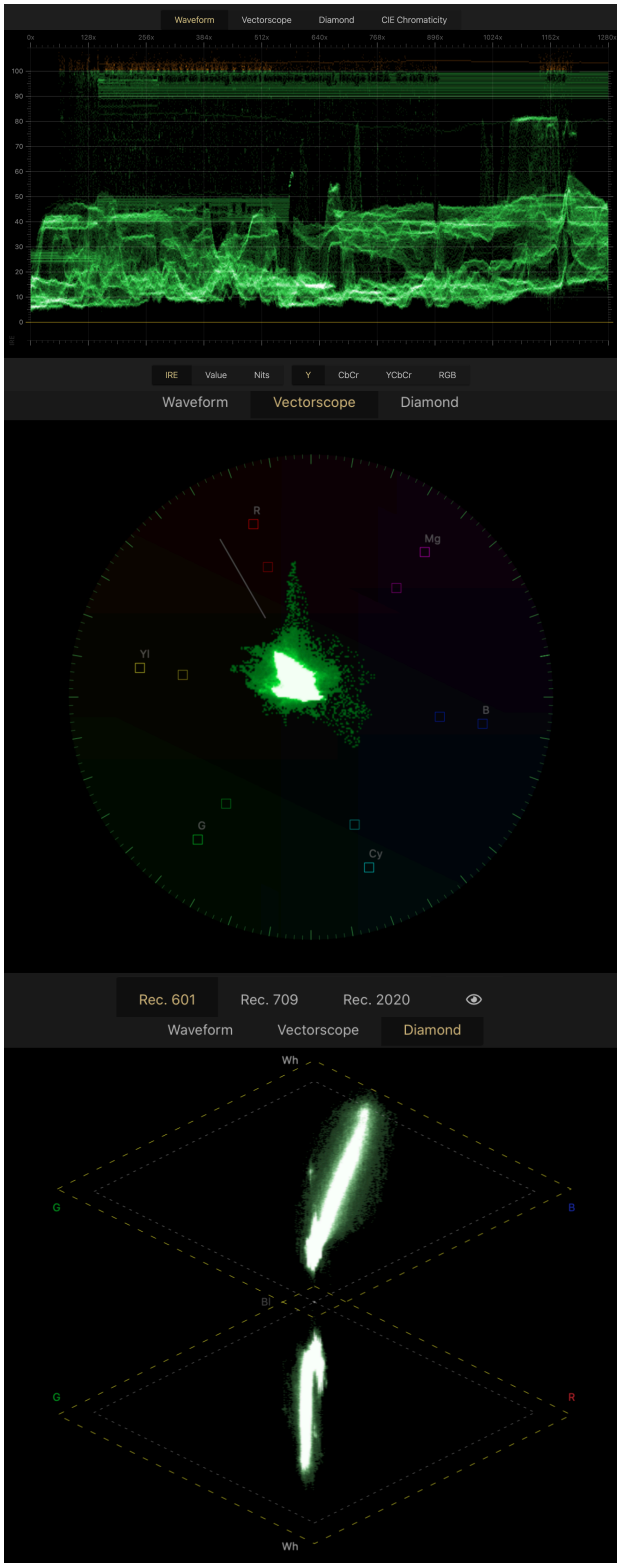
rack and desktop clutter and streamlining remote broadcast environments where space is at a premium. Bridge Technologies' InstrumentView kits and Widglets provide even more versatile setup options in cramped spaces.



Video Preview

Full video preview with next-to-no latency allows production professionals to verify that the signal corresponds with image expectations. For creatives, a range of video overlays can also be applied. In SDR, this includes zebra pattern, and in HDR, False Colour shows the nit value of every pixel to show the brightest points of each image.





Waveform and Vector Colorimetry

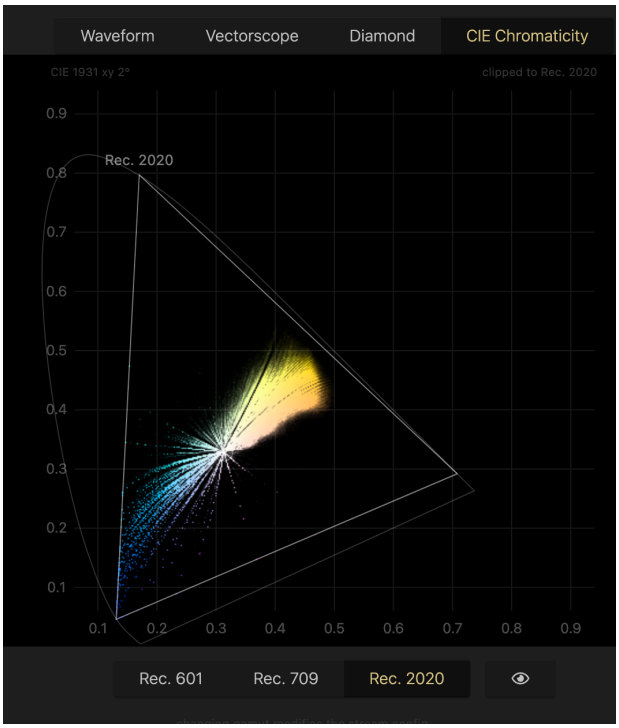
Including a full range of scopes that incorporate Rec.601, Rec.709 and Rec.2020 compatibility, and a waveform which supports graticule for IRE and NITS, camera painters can easily address colour saturation issues at-a-glance. Unlike fixed viewers, the browser-based nature of the creative tools in the VB440 reduce the number of screens required in a workspace, whilst allowing for scopes to be scaled to the space available. Adjustment of measurement scales and line-select capabilities allow camera painters to hone in on individual data points.

HDR Preview

As well as facilitating HDR data within all of the associated scope and metres – including IRE and nits graticules – the VB440 also supports full HDR preview on a non-HDR screen. This is achieved through application of an HDR-sRGB LUT, which allows colourists the ability to see a preview of what audiences at home are seeing. HLG, PQ and S-Log3 are also supported, with auto-detection of HDR from NMOS.

HLG, PQ and S-Log3

In relation to the addition of HDR functionality, the VB440 starts from the point of being able to identify the type of coded stream coming in, be this HLG, PQ, S-Log3, or a number of other standards, either through manual setting or through automatic recognition from ancillary data or NMOS signalling data. The user is then able to access any of the existing wide range of waveform scopes within the VB440 and apply them to this HDR stream. In addition though, the Graticule has been adjusted to accommodate the needs of HDR more comprehensively, including not only IRE but NITS graticules, as well as an ability to adjust Graticule sensitivity. An HDR CIE Chromaticity scope has been added which demonstrates the full colour gamut of a given video, and provides a number of options in order to suit the user's need. Of course, since HDR still represents a transitional standard that has not fully penetrated the market, the VB440 also facilitates data and image visualization according to SDR parameters.

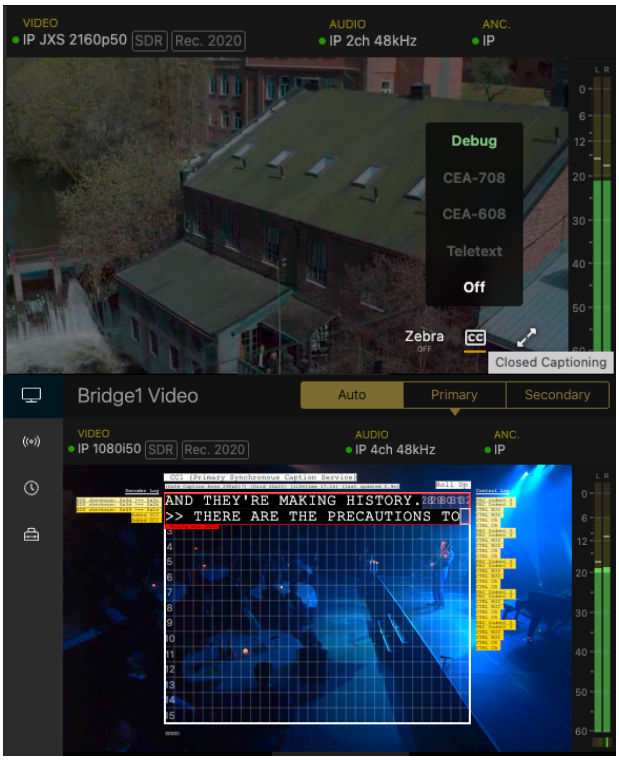


NMOS

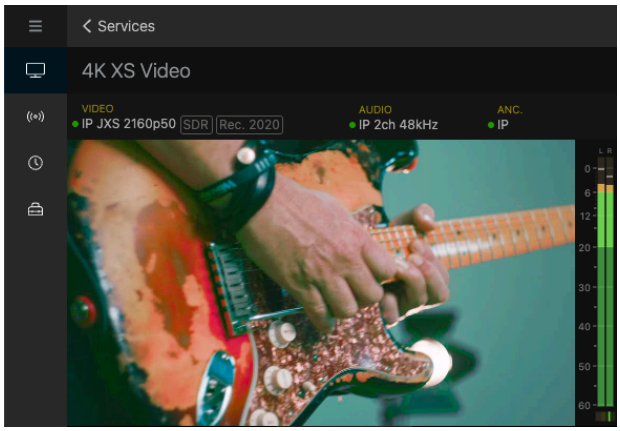
The VB440 incorporates full NMOS IS-04 and IS-05 support in order to allow users to integrate its functionality into their existing workflows. NMOS - a range of APIs with open specifications designed specifically to accommodate IP video - provide the guidelines needed to allow other devices to interpret and integrate each other's functions. Every element of the VB440 is NMOS compliant, meaning that its full range of features can be integrated into existing production workflows. This provides users with the full power of the VB440 – as both receiver and sender – whilst granting incredible levels of flexibility.

Closed Captioning

The Closed Caption review function has been introduced in order to aid broadcasters in their commitment to providing accessible productions which meet the diverse needs of audiences, including those with hearing impairment. The Closed Caption addition to the VB440 will allow the display of Closed Captions (CEA-608/CEA-708) and Subtitles (OP-47), giving visualization of the incoming ancillary data on the output reference video, and further allowing the user to review, control and correct caption placement and characters. Alongside displaying the captions an additional ´debug-view´ functionality provides a deeper insight with decoder logs, encoding errors, field reversal



warnings, and a visualisation of the grid itself. The functionality supports all of the most common incoming caption types, and thus allows operators to ensure that captions are correct before handing off the signal, adding a new layer of protection for the operator.



JPEG XS

JPEG XS delivers a similar level of compression to that of the JPEG 2000 standard – with lossless compression of between 10 and 15 times the original, but with significantly lower latency – thus allowing for responsive, real-time production of broadcasts. The ability of JPEG XS to operate across both PTP and 'traditional' Transport Streams makes it an incredibly flexible compression standard, ensuring exceptional image quality. In essence, JPEG XS allows for broadcast networks to do more with less. As adoption of the standard increases across broadcast providers, its integration into the suite of Bridge Technologies products represents the importance that the company places in staying at the forefront of developing standards.

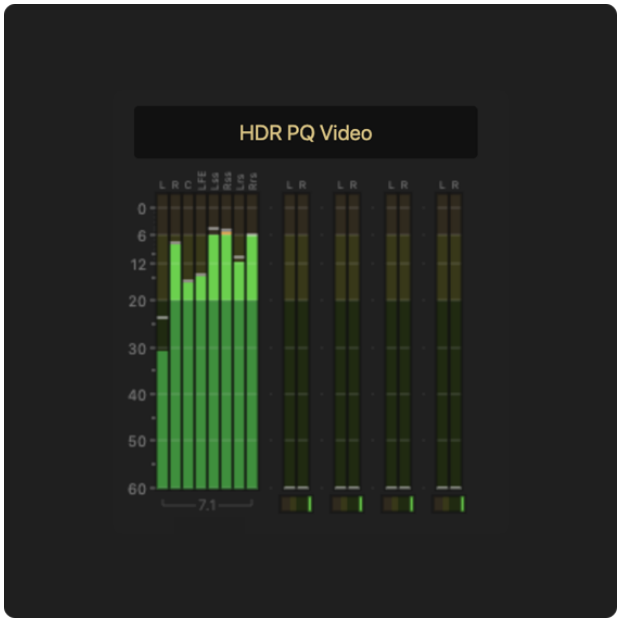
Audio Metering

In OB van and remote environments, audio engineers don't always have the luxury of their own audio space. VB440 tools are built to accommodate their needs, allowing them to work with just browser and headphones, on-site or halfway around the world. The VB440 makes space for sound by giving a compact view that shows a high number of simultaneous audio streams, with customisable channel mapping, the ability to listen to multichannel audio through stereo headphones, and visual insight into each flow with Gonio, LUFS and room meters.

Professional sound engineers

With the VB440, audio engineers are granted the ability to both hear and visualise sounds across the full production, listening to 7.1 and 5.1 outputs over stereo through any browser, whilst monitoring multi-speaker outputs through ‘room’ meters and customised mapping. Simultaneous display of different audio groups supporting 2110 channel order is also included. A full range of professional audio meters are incorporated, designed by audio professionals to meet the needs of sound engineers working on-site, remotely or in a distributed production environment.

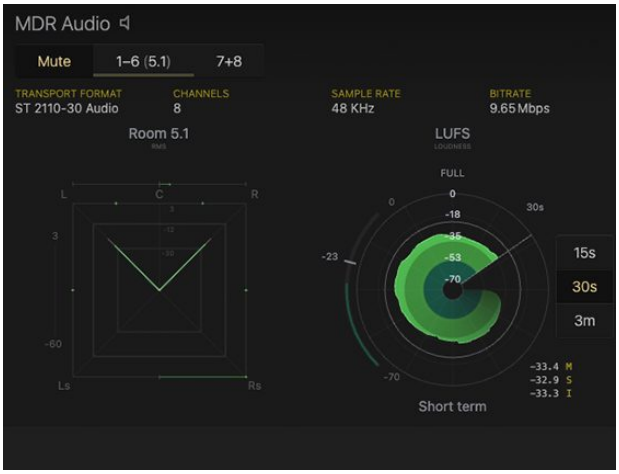
64 channel monitoring



The VB440 facilitates measurement of multichannel audio across 64 channels within one flow. Channel ordering can be signalled as part of AC-3 or E-AC-3 bitstreams or per-stream configured channel order. The compact view shows at-a-glance all simultaneous audio flows, with customisable mapping available for each.

Audio Meters

The VB440 incorporates an extensive rage of audio metering tools, including LUFS, Gonio and room meters. Each represents true PPM long-throw metering with peak hold and proper ballistics for accurate reading of stereo audio levels. The meters have a sub- 5ms fast attack for sharp and fast transients, and conform to the IEC 60268-18 Digital Scale.

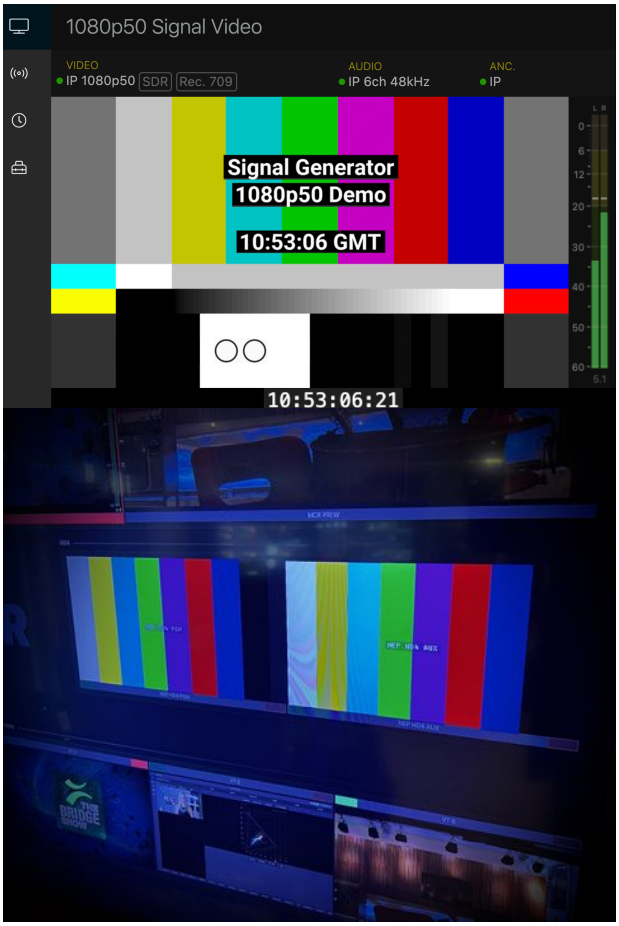


Signal Generation

Equipped with the ability to not only monitor but also generate signals, the VB440 makes studio setup faster and more efficient, allowing studio engineers to check the integrity of all connections.

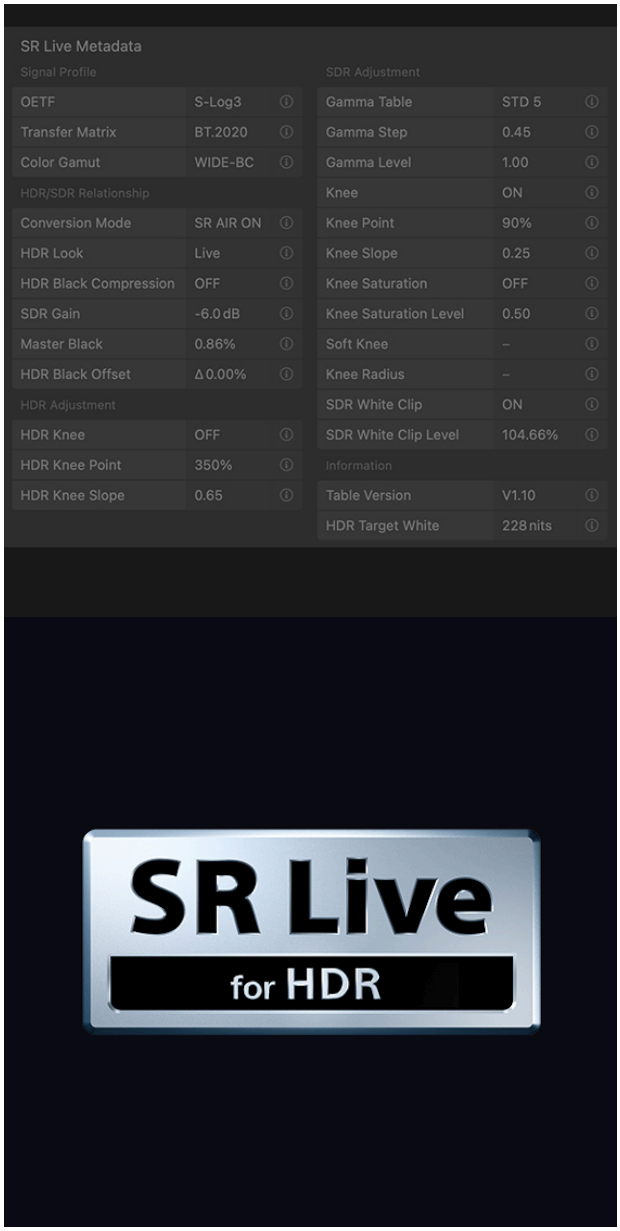
Signal Generator

By generating placeholder reference signals for each auxiliary element, network engineers can more quickly and efficiently test their studio setup, including elements that are not due to be added until later (such as incoming uplinks). Setup is achieved using the GUI itself, or through NMOS – with each element allocated a colour bar and AV ident. Covering signals for any resolution or framerate, including film frames and interlaced formats, for both SDR and HDR signals, the signal general capability allows engineers the ability to test the reliability and security of the network before even unpacking. As such, the VB440's signal generation abilities provide the very apparent advantage of facilitating dramatically more efficient setup times and early error detection.



SR Live Metadata

SR Live for HDR technology represents a growing necessity in the context of both live and post-production broadcast, and is therefore featured within the VB440 in line with Bridge Technologies' commitment to pushing forward developing standards. The addition of SR Live Metadata capabilities thus represents yet one more expansion to the multitude of tools, standards and formats which the VB440 can not only monitor, but turn into meaningful and usable data for creatives to use on-the-fly in remote and live production settings.



SR Live for HDR

SR Live Metadata – a solution proposed by the Sony Corporation - is a group of data required for mutual conversion of HDR/SDR contents in the “SR Live for HDR” solution that simultaneously produces HDR/SDR contents. It can be embedded in SDI signals, MXF files and IP networks, and by combining with compatible products, it is possible to simplify operations and prevent setting mistakes during conversion.

Post-Production

Not only one of the most powerful tools available on the market in the field of live production, the comprehensive set of tools contained within the VB440 can also be applied to the full post-production environment; video views, audio meters, waveform, vectorscope, packet analysis tools and an extensive range of other features.

Post-Production

The application of these tools significantly enhances the quality, precision and speed with which post-production edits can be achieved, whether these are undertaken on-site or remotely, since the visualisation tools can be displayed in conjunction with any editing program of choice through an HTML-5 browser. The data is output from the workstation to the VB440 over IP and returned as visual representations of analytics in real-time, just as it would be in a live production. The VB440 can easily be coupled with powerful workstations accommodating 10 gigabit outputs, facilitating uncompressed and 4K editing. This dual application of the intuitive and highly usable features of the VB440 minimises the learning curve needed for the production team, allowing all team members to work with the same tools, regardless of whether they are operating in a live- or post-production environment.

WIDGLETS© API

With the Widglets API, a user can accommodate multiple cameras with multiple waveform vectorscopes and streams via a single HTML5 video monitor view, which means different people in different places can view all this data, instead of splitting it by location or technician: a clear and apparent advantage in any production setting.

HTML5 EMBEDDED VIDEO MONITOR

Bridge Technologies Widglets™ API HTML5 video monitor for the VB440 allows the probe to become truly multifunctional beyond its current widespread deployment for monitoring IP networks, extending its usefulness well beyond test and measurement.

It achieves this by fundamentally rethinking the world of remote production. Until now, a Multiviewer needed to be run locally, but with Widglets, that Multiviewer functionality is now available anywhere, direct from a browser: full remote access with precision latency and 100% accuracy. Physical distance becomes irrelevant.

The Widglet Multiview is an HTML5 embedded video monitor capable of full-motion, colour accurate playback of uncompressed video content with close to zero latency in a web browser. This enables a blur between location specific events and underpins the full capability of remote production. It eliminates the issues associated with latency in encoding/decoding and travel, and thus eliminates the creative errors often associated with latency; such as the 'overshooting' and 'undershooting' that camera painters sometimes fall victim to. Further, by adding scope functions on a "one-per-camera" basis, operators are granted much needed respite from toggling signals between sources. Widglets make time-critical tasks entirely more achievable.

Orchestration is also significantly improved. With Widglets one can orchestrate different working environments as easily as switching web pages. This allows for an infinite number of setups, recallable at the blink of an eye, and limited only to the scope of the technology itself. Managing displays with inclusion of any known data source is then possible, with users able to share real time statistical viewer data together with full-motion, real-time video. From production crew to channel management teams, everybody is on the same page, in real-time.

Director, Technical Director, Camera Painter, Lighting Director, EVS – all members of the teams can all manage the production from multiple locations across the world. Everyone is connected by the same accurate views, with synchronisation performed on-the-go at the receiver so that all services – combining video, audio and auxiliary data – are always in sync, whether they are positioned next to each other or half a world away.

In this way, Widglets also dramatically increases the number of camera painters involved in a single project. Currently, the number of cameras which can be analysed are logistically limited by both

space and cost, with multiple space-consuming boxes required. Widglets eliminates this, allowing for display on a commentator monitor, iPad or work station, and interfacing with multiple sources and next-to-no latency, without the need for SDI cabling or router control.

This can be taken even further with control through SmartPanel, thus eliminating the need for keyboard or mouse at all. Widglets maintains full NMOS IS-07 support, so control from any device supporting this can be performed, allowing infinite configurability through easy-to-use APIs, and the potential to embed the VB440 Widglet within your own application, giving direct access to full-motion, low-latency video together with any function you need anywhere on your LAN or WAN structure.

With VB440 Widglets, you are the architect, you decide.

Aluminium Kits

The Instrument View Engine (IV), provides deep analytics displays for the VB440 Appliance. The separately designed Instrument View kits use the state-of-the-art Apple iPad Pro (11 inch) to enable the most responsive, powerful and colour accurate touch panel possible. Together with the Instrument View aluminium kits, the VB440's advanced analytics capability becomes more flexible and easy-tp-use than ever.

4RU Rack - VESA Gas Arm - TableTop - Dual Panel

Contained within a stylish aluminium casing for an 11 inch iPad Pro, the PoE+ kits facilitates display of the intuitive, analytical capabilities of the VB440, providing a flexible, portable and stylish HTML5-based visual display of packet behaviours in a way that allows anyone, anywhere to monitor network data.

Most importantly, this 'accessible anywhere' approach is facilitated through the Power over Ethernet Plus (PoE+) technology supplying the unit directly with both its energy and networking needs. Fully redundant wired Gigabit Ethernet connection speed is enabled on the iPad Pro. Because the system harnesses this highly unique PoE+ capability, it provides unrivalled reliability, stability and convenience – and eliminates reliance on the presence of a physical power socket or (often unstable) Wi-Fi connection.

Further, by making use of a readily established and easily available iPad Pro screen type (supplied on a 'Bring Your Own' basis), the aluminium kits exclude the need for expensive production monitors, whilst maximizing ease-of-use through intuitive touch navigation. With ultra-fast GPU and CPU, and HDR capable retina display with high colour accuracy, the PoE+ Aluminum Kits are able to display VB440 outputs with speed and precision.

These robust and flexible solutions have been designed to support the fundamental raison d'être of the VB440; the ability to visually access and assess IP network performance and packet transfer from anywhere in the world, and make use of that information at any point along the creation chain, end-to-end, from production to distribution. The versatility of the Kits gives it an unrivalled form factor in production environments, allowing for discreet, space-saving mounting in whatever configuration is required. Simply purchase the iPad Pro and an Instrument View kit that fits your space requirements, assemble it, and off you go.

IV-Kit 1
19" 4RU iPad Pro mounting kit with PoE (Power over Ethernet)
– typically used in engineering environments where other equipment is located, so the checking of signal integrity can be done immediately when bringing services on-line or performing service modifications.

IV-Kit 2
VESA gas arm iPad Pro kit with PoE (Power over Ethernet)
– utilized in space constrained places such as control rooms, audio engineering work areas and general studio locations where space is at a premium, this form-factor is suited to be mounted on VESA gas arms.

IV-Kit 3
TableTop iPad Pro kit with PoE (Power over Ethernet)
– a beautiful and integrated design made to be used anywhere signal validation needs to be undertaken in office, MCR environments or meeting rooms: any situation where the tools need to be displayed in a subtle and aesthetic way.

IV-Kit 4
Dual Panel 19" 4RU iPad Pro kit with PoE (Power over Ethernet)
– The Instrument View kits come with a fully redundant ethernet adapter that also contains PoE (Power over Ethernet) capability, so the panel can be wired with network and power over a Cat6 A

cable or with dual Cat6 A cables for full redundancy.

Technical specifications

Read more

VB440 APPLIANCE

PHYSICAL SPECIFICATIONS

Form factor 1RU: H (43mm (1.7) W (437mm (17.2) D (503mm (19.85)
Weight: 20Kg (44 lbs)
Operating Temperature Range: 5 – 35 (41 – 95)
Non-Operating Temperature Range: – 40 – 70 (-40 – 158)
Operating Relative Humidity Range: 8% – 90% (non-condensing)
Non-Operating Relative Humidity Range: 5% – 95% (non-condensing)
Power Supply: 400W Redundant PSU
Power Efficiency: 94%
Voltage: 100-240 Volt AC
Input Frequency: 50-60Hz

INSTRUMENT VIEW ENGINE
RTP Errors average, min/max per flow
IAT average, min/max per flow
Bitrate average, min/max per flow
PTP delay average, min/max per flow
Average Packet rate
DSCP QoS parameter setting per flow
Packet TTL (TimeToLive) per flow

SUPPORTED STANDARDS

SMPTE ST 2022-6 – SDIoIP, encapsulated SDI over IP

SMPTE ST 2022-7 – Dual network parallel redundancy

SMPTE ST 2110-10/20/30/40 – SMPTE suite of standards for uncompressed flows of Video, Audio and ancillary data

SMPTE ST 2110-22 – Compressed video

SMPTE ST 2110-316 – AES3 transport containing uncompressed PCM audio or compressed AC-3/E-AC-3 audio

OP-47/SMPTE RDD 8, CEA 608, CEA 708 – Subtitles / Closed Captioning

PTP – IEEE 1588v2, ST 2059-2 (Multicast, mixed SMPTE w/o negotiation)

CURRENT SUPPORTED VIDEO FORMATS

	FORMAT	COLOR SPACE	SAMPLE STRUCTURE	BITS	FRAME/FIELD RATE
SD Standard Definition	480i, NTSC	YCbCr	4:2:2	8/10	59.94
	576i, PAL	YCbCr	4:2:2	8/10	25/50
HD High Definition	720p	YCbCr	4:2:2	8/10	23.98/24/25/47.95/48/50/59.94/60
	1080i	YCbCr	4:2:2	8/10	50/59.94
	1080p	YCbCr	4:2:2	8/10	23.98/24/25/47.95/48/50/59.94/60
UHD Ultra High Definition	2160p	YCbCr	4:2:2	8/10	23.98/24/25/47.95/48/50/59.94/60
	4K	YCbCr	4:2:2	8/10	23.98/24/25/47.95/48/50/59.94/60

SUPPORTED VIDEO FORMATS FOR REMOTE VIEWING

Transport	Pixel Format	Format
ST 2022-6 (SDI/IP)	10-bit YCbCr-4:2:2	SD: 480i, 576 HD: 720p, 1080i, 1080p, 1080PsF, 2Kp, 2KPsF Frame Rates: 23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60 fps
	10-bit YCbCr-4:2:2	All VSF TR-05:2018 formats: 720p Format Group 1080i Format Group 1080p Format Group UHD-1 SDR Format Group Any resolution <= 4K (4096×2160) combined with any frame rate <= 60 fps Any resolution <= 8K (8192×4320) combined with any frame rate <= 15 fps

ST 2110-22 JPEG XS	8-, 10-, 12-, 14- or 16-bit YCbCr-4:2:2.	4K license (standard): Any resolution <= 4K (4096×2160) combined with any frame rate <= 60 fps. 8K license (special interest): Any resolution <= 8K (8192×4320) combined with any frame rate <= 60 fps

All formats support Rec. 601. Rec. 709 and Rec. 2020 color spaces using SDR, HDR PQ, HDR HLG or HDR S-Log3 transfer characteristics

CURRENT SUPPORTED AUDIO FORMATS

	SAMPLE RATE	BITS	CHANNEL ORDERING
SMPTE ST 2022-6 (SDI over IP)	48 kHz	20	Mono, Stereo, Quad, 5.1 Surround, 7.1 Surround
	44.1 kHz, 48 kHz, 96 kHz	24	Mono, Stereo, Quad, 5.1 Surround, 7.1 Surround
	48 kHz	32-bit float from AC-3/E-AC-3	Mono, Stereo, 5.1 Surround, 7.1 Surround
SMPTE ST 2110-30 (AES67)	44.1 kHz, 48 kHz, 96 kHz	16/24	Mono, Stereo, Quad, 5.1 Surround, 7.1 Surround
	88.2 kHz, 192 kHz	16/24	Mono, Stereo, Quad, 5.1 Surround, 7.1 Surround
SMPTE ST 2110-31 (AES3 over IP)	44.1 kHz, 48 kHz, 96 kHz	16/20/24	Mono, Stereo, Quad, 5.1 Surround, 7.1 Surround
	48 kHz	32-bit float from AC-3/E-AC-3	Mono, Stereo, 5.1 Surround, 7.1 Surround

SUPPORTED AUDIO FORMATS FOR REMOTE LISTENING

Transport	Word Length/Codec	Sample Rate
ST 2022-6 (SDI/IP)	20-bit 24-bit	48 kHz 44.1 kHz, 48 kHz, 96 kHz
ST 2110-30 (AES67)	16-bit, 24-bit	44.1 kHz, 48 kHz, 96 kHz (standard)88.2 kHz, 192 kHz (non-standard)
ST 2110-31 (AES3/IP)	16-bit, 20-bit, 24-bit PCM encapsulated in 32-bit subframes	44.1 kHz, 48 kHz, 96 kHz
ST 2022-6 (AES3/SDI) ST 2110-31 (AES3/IP)	Compressed AC-3/E-AC-3	48 kHz

SUPPORTED AUDIO CHANNEL MIXING

Source	Destination/Browser	Mixing rules
Stereo (ST)	Mono	M = 0.5(L + R)
Stereo (ST)	Stereo	Passthrough
Quad (U4)	Stereo	L = 0.5(L + L s)
		R = 0.5(R + Rs)
5.1 Surround (51)	Stereo	L = L + 0.5(C + L s)
		R = R + 0.5(C + Rs)
		The subwoofer (LFE) channel is lost
7.1 Surround (71)	Stereo	7.1 5.1 Stereo
Quad (U4)	Quad	Passthrough
5.1 Surround (51)	Quad	L = L + 0.5C
		R = R + 0.5C
		L s = L s
		Rs = Rs
		The subwoofer (LFE) channel is lost
7.1 Surround (71)	Quad	7.1 5.1 Quad
5.1 Surround (51)	5.1 Surround	Passthrough
7.1 Surround (71)	5.1 Surround	L = L
		R = R
		C = C
		LFE = L FE
		L s = L ss + Lrs
		Rs = Rss + Rrs

Additional mixing rules are supported on request. Channel ordering is derived from AC-3/E-AC-3 metadata, NMOS SDP or the per-stream configured channel order

SUPPORTED ANCILLARY DECODING

Transport	Specification	Comments
ST 2022-6 (SDI/IP)	ST 272	1-16 audio channels over SD-SDI
	ST 299-1	1-16 audio channels over HD-SDI
ST 2022-6 ST 2110-40	ST 12-1, ST 12-2	Time and Control Code
	ST 334-1	Closed Captioning (CEA-708) CDP
	ST 352	Payload Identification Codes
	ST 2010	SCTE 104 Data
	ST 2016-1, ST 2016-3	AFD and Bar Data
	ST 2031	DVB/SCTE VBI Data incl. EBU Subtitles
	ST 2108-1	HDR/WCG Metadata
	OP-47/RDD 8	OP-47 Subtitles
	SR Live Metadata	Sony SR Live for HDR
ST 2022-6 (AES3/SDI) ST 2110-31 (AES3/IP)	ST 337	AC-3 and E-AC-3 compressed audio

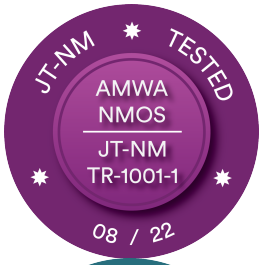
JT-NM Tested

JT-NM TESTED SMPTE ST 2110 AND NMOS/JT-NM TR-1001-1

The JT-NM Tested Program again offers documented insight into how vendor equipment conforms to specific SMPTE standards, AMWA NMOS specifications and selected real-world scenarios. The JT-NM (Joint Taskforce on Networked Media) is a self-coordinating group of industry bodies working together on the development of IP technologies for professional media systems. Admin Group Members include the Advanced Media Workflow Association (AMWA), the European Broadcasting Union(EBU), the Society of Motion Picture and Television Engineers (SMPTE©), and the Video Services Forum (VSF). WEBSITE

August 2022
2022 NMOS/TR-1001 Catalog DOWNLOAD

August 2022
2022 SMPTE ST 2110 Catalog DOWNLOAD



ORDERING CODES

VB440 IP PROBE

VB440-Appliance – High-Performance appliance for Instrument View analytics of ST2110 and ST2022-6, capable of dual stream analysis of complete ST2022.7 redundancy analysis
– Dual 100G QSFP interfaces for 10G, 25G, 40G, 50G 100G connectivity
– 40Gbps data rate
– Two simultaneous Instrument View (IV) users

VB440-40Gbps-OPT – Additional 40Gbps analysis capability spread across the dual interfaces for a total of 2x60Gbps data rate when utilising ST 2022-7 redundancy. (Maximum bandwidth on one interface is 80Gbps)

JPEGXS-OPT – The JPEG-XS option enables monitoring and analysis of the ST 2110-22 standardised low-latency compression JPEG-XS streams (up to 8 in total)

GEN5-OPT – The Signal Generator allows for placeholder reference signals to be generated and test network performance when setting up a studio, OB Van or production environment. Ability to generate up to 5 signals

IV-OPT – Additional IV licenses (up to 8 in total)

IV-KIT-1 – 19” 4RU iPad Pro mounting kit with PoE (iPad Pro 11 inch model, not included)

IV-KIT-2 – VESA gas arm iPad Pro kit with PoE (Arm and iPad Pro 11 inch model, not included)

IV-KIT-3 – TableTop iPad Pro kit with PoE (iPad Pro 11 inch model, not included)

IV-KIT-4 – Dual Panel 19´´ 4RU iPad Pro kit with PoE ((2 x iPad Pro 11 inch model, not included))

For availability, please contact your local representative

Click below to learn more about compatible technology options:

AES67
MediaWindow™
PTP
ST2022-6
ST2022-7
ST2110

Environmental

Eurovironment
RoHS
WEEE
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