

VB440



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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.

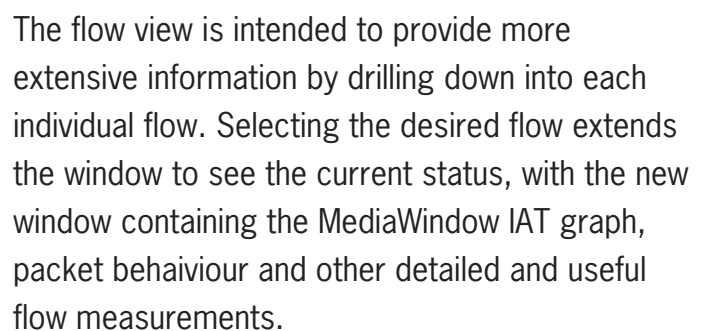
The VB440 gives at-a-glance insight into the full production environment through the intuitive InstrumentView. The VB440 provides analysis of SD, HD, FHD, UHD and 4K (resolution), SDR and HDR (colour), ST2110, ST2022-6, TR-07, TR-08 (transfer formats) along with full ST 2022-7 redundancy monitoring. 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 200 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 200Gigabit Ethernet connectivity, the VB440 can be connected directly to any 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.



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.

 Packet Capture

Time Limit (ms)

10000

Video Frame Limit

0

Packet Limit

10000

☒ Capture PTP traffic

☒ Align video captures to start of frame

☐ Rolling capture (Requires Packet Limit)

☐ Only capture errored packets (Packets with Ethernet/IP/UDP errors) Select all on: Primary, Secondary

Flow to capture	Bitrate	Packet Rate	Type	Path
☒ Matrox 1 Video@Primary	2.18 Gbps	205.75 kpps	Video	Primary
☐ Matrox 1 Video@Secondary	2.18 Gbps	205.75 kpps	Video	Secondary
☒ Matrox 1 Audio@Primary	2.74 Mbps	1.00 kpps	Audio	Primary
☐ Matrox 1 Audio@Secondary	2.74 Mbps	1.00 kpps	Audio	Secondary

New Capture

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.

Whilst error logging has been incorporated within the probe for some time, this itself requires that parameters for inclusion are set. Sometimes, perfectly reasonable parameters may be set which still miss crucial but not critical mistakes on the network, which – if they had been logged – would have helped in diagnosing underlying problems, either preventatively or retrospectively. Event logging instead records every flow change or event occurrence on the network, no matter how seemingly mundane, and does so for the video, audio and ancillary data of any service joined to the VB440. The logging is continuous, and a log of up to 2000 events can be maintained.

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.

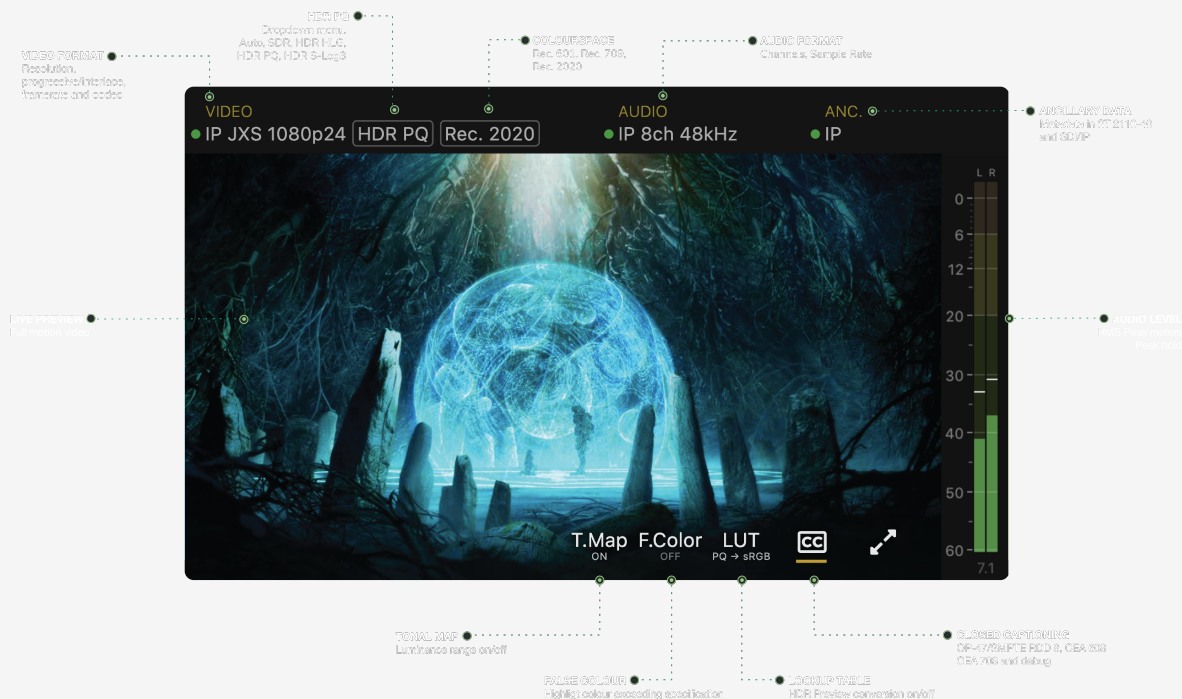
With the VB440 accurately synchronised to the same Grand Master or Boundary Clock as other sources, absolute path-delay can be calculated and displayed for the services chosen and any deviation is displayed in the intuitive path-delay graph for the individual flows inside a service.

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

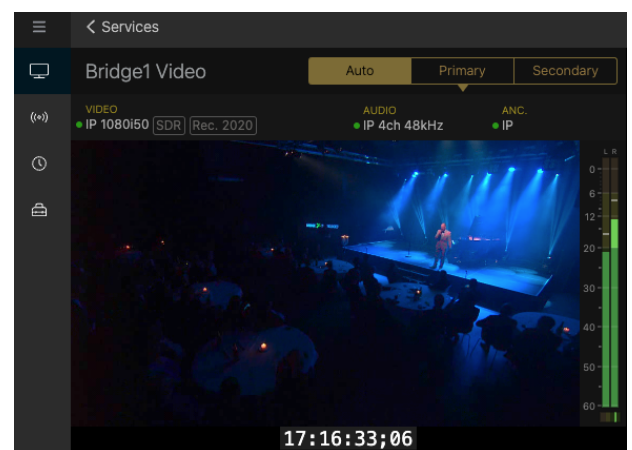
Allowing camera painters, colourists and other image-based creatives to condense their workspace into a single browser, the VB440 eliminates the need for space-consuming specialist equipment, whilst providing all of the functionalities needed to fine tune images, both live and in post-production. Access 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



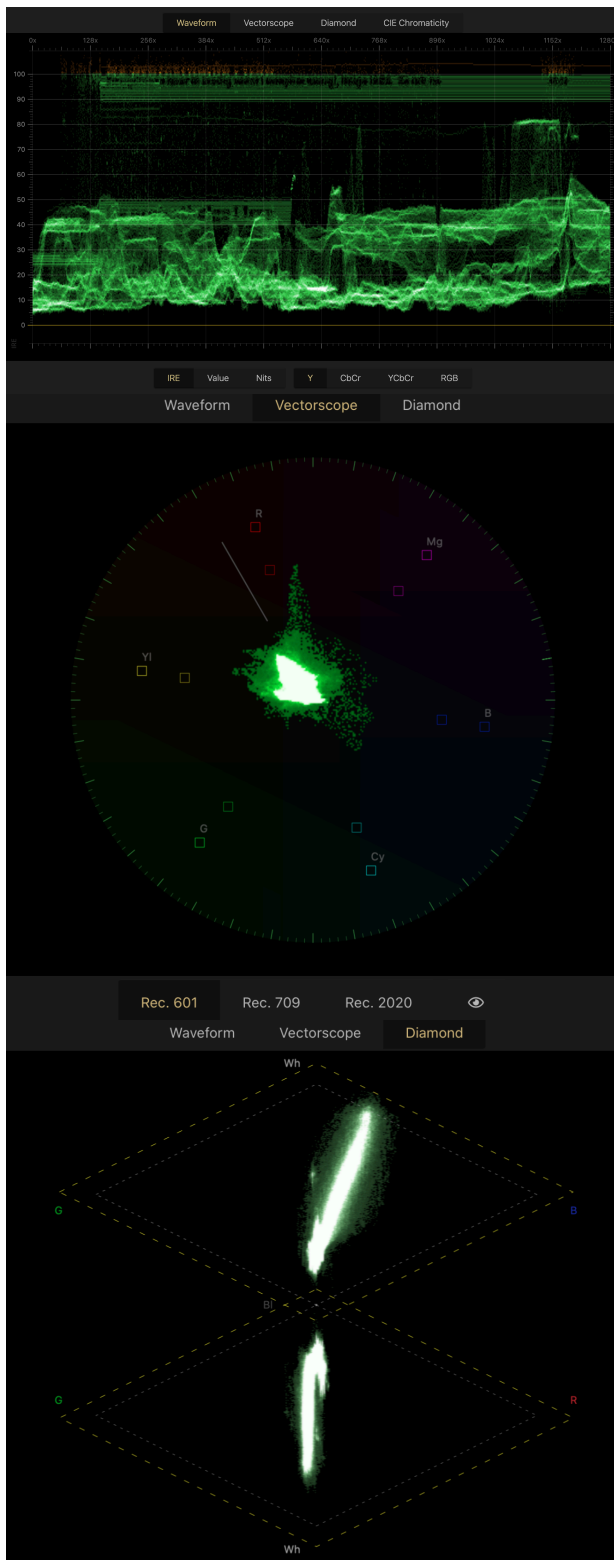
Video Preview

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.

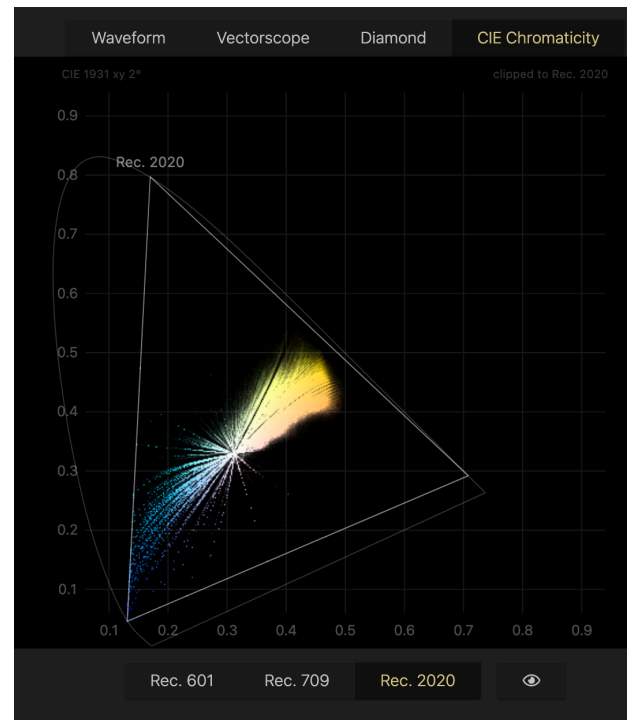
HDR Preview

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 for ST2110 and from ST352 ancillary data for ST2022-6 and TR-07.

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

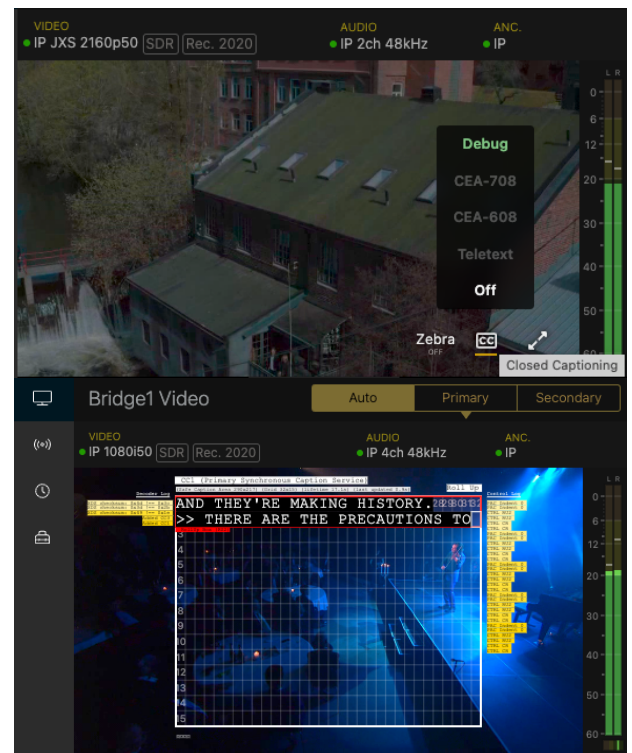
The VB440 incorporates full NMOS IS-04, IS-05, IS-07 for PTP measurements and IS-09 for PTP configuration support, allowing users to integrate

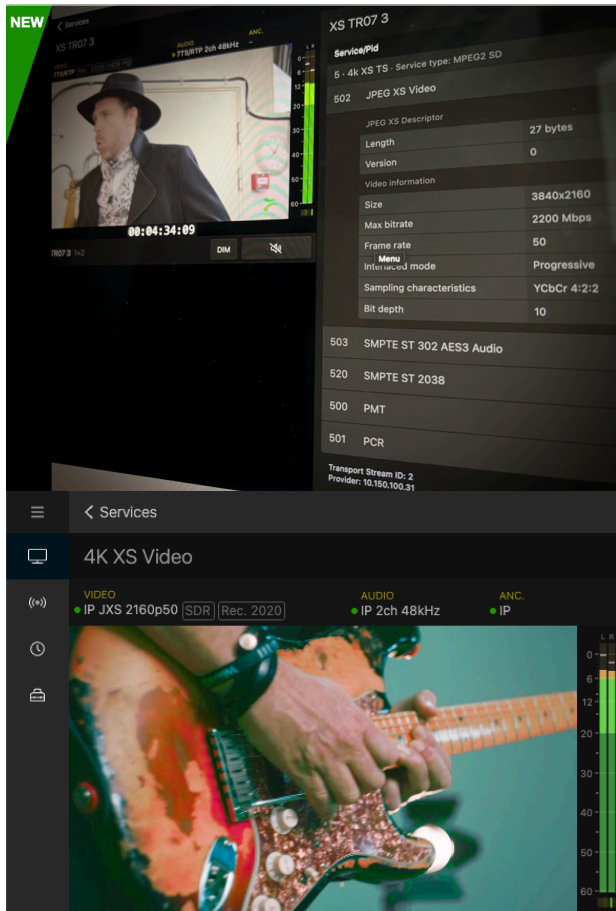


its functionality into their existing workflows. NMOS - a range of APIs with open specifications designed specifically to accommodate IP video - provide the guidelines needed to allow other devices to interpret and integrate each other's functions. Every element of the VB440 is NMOS compliant, meaning 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.





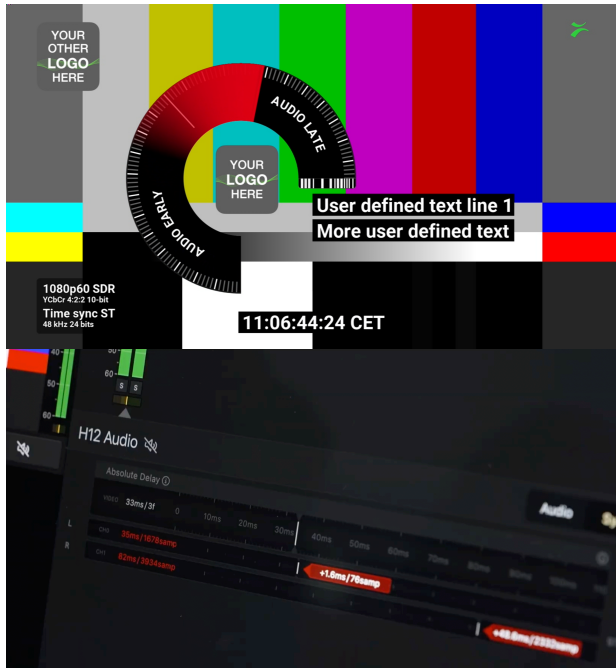
JPEG XS

JPEG-XS is a lightweight codec that offers visually lossless compression at ultra-low latency, making it an efficient alternative to uncompressed video in professional video workflows. JPEG-XS can be transmitted as ST 2110 (VSF TR-08) or encapsulated in MPEG-2 Transport Stream (VSF TR-07). JPEG-XS over TS has full support of decoding and analytics as well as insights into PIDs, PSI/SI tables and other metadata. JPEG-XS differs from the JPEG 2000 codec by using a line-based approach rather than intraframe processing, enabling lower latency and visually lossless quality at compression ratios between 2:1 and 10:1. 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 VB440 represents the importance that Bridge places in staying at the forefront of developing standards.

IPMX

VB440 production probe has received IPMX certification, confirming full compliance with the VSF TR-10 Technical Recommendation. IPMX (Internet Protocol Media Experience) is an open-standard initiative derived from SMPTEST 2110 and adapted for ProAV applications, enabling interoperable IP-based media transport across live events, corporate AV, education and venue installations.

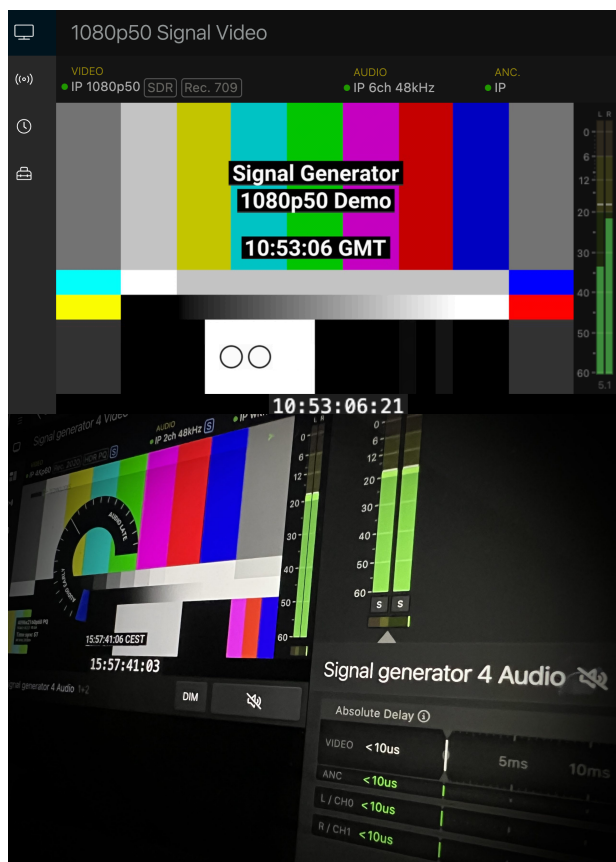




AV Sync Generator

Bridge's transformative AV Sync Generator with Ancillary Data solution for the VB440, addresses one of the industry's most persistent challenges at the point of production. This innovation ensures that live broadcasts, especially those distributed across multiple networks from a centralised OB production point, maintain seamless, frame-perfect alignment of audio and video. The VB440's AV Sync Generator features an on-screen rolling shutter with early and late zones, accompanied by a visual and auditory signal ('blink and beep') to facilitate manual synchronisation. It also displays a range of different colour bar types and allows for the insertion of broadcaster logos on the sync screen. However, its most significant advancement is in its visualisation of synchronisation. A built-in sync client in the VB440 displays, in real-time, the all-time deltas between video and individual audio channels or groups with high precision, enabling speedy correction of sync issues. With the ability to see up to 64 individual channels in a stream, and with stream groups which include immersive audio and even multiple streams, this means that there is no practical channel limit to resynchronisation of audio. In this way, rather than relying on packet-based timestamps, the VB440 embeds machine-readable electronic markers directly into the audio signals and uses a client to read the synchronisation points of the video, thus enabling real-time detection and correction, and ensuring frame-accurate synchronisation with minimal intervention. The AV Sync Generator also provides synchronisation for ancillary data – a function particularly beneficial for ensuring alignment of

metadata such as captions, timecode, and signalling, and thus critical for maintaining consistent video length, accurate start and end points, and precise triggering across complex production workflows. Support comparing AV sync measurements across multiple services is also a key attribute.



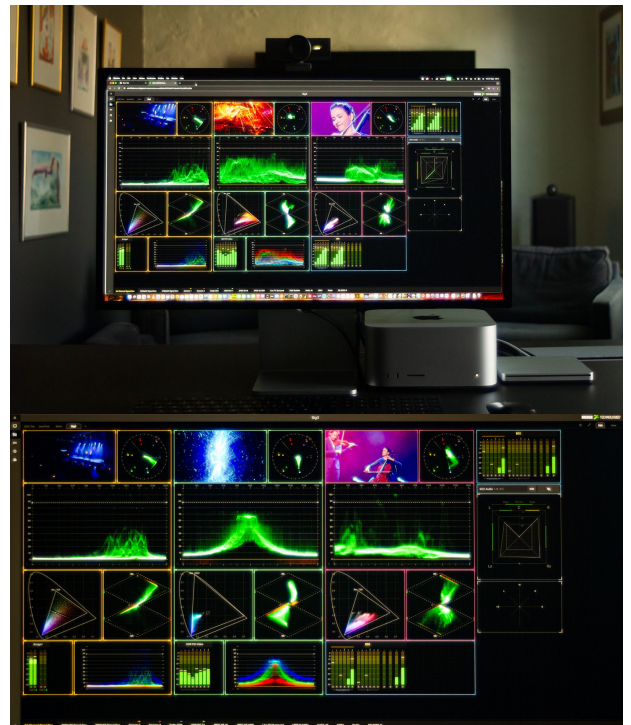
Signal Generator

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.

Canvas Interface

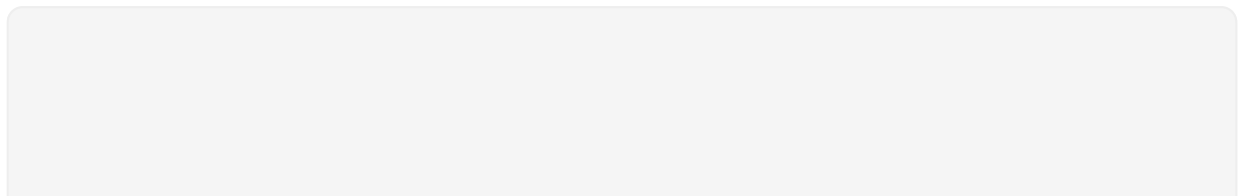
Canvas allows users to completely customise their workspace, combining video and audio previews with a vast range of graphs and visualisations in order to let production professions – be they camera painters, audio engineers or network

technicians – even quicker and easier access to the tools that underpin their roles. In essence, the VB440 gathers network data in an IP production environment, and converts this to usable, intuitive information that can inform almost every part of the production process. Most importantly, it makes this available with next-to-no-latency, using only an HTML5 web browser. Allowing up to eight users simultaneous access to the VB440's extensive set of features, a range of production professionals can use the features of the VB440 to guide their work, simultaneously, live, from anywhere in the world. Users can click-through to access elements including (but not limited to) Gonio, LUFS and room meters for audio; HDR-on-SDR-screen previews, colorimetry with CIE, vectorscopes and waveforms for video (which now includes both YRGB parade and overlay view), and an extensive range of modifiers that allow users to save their selected scopes together with their own designs.

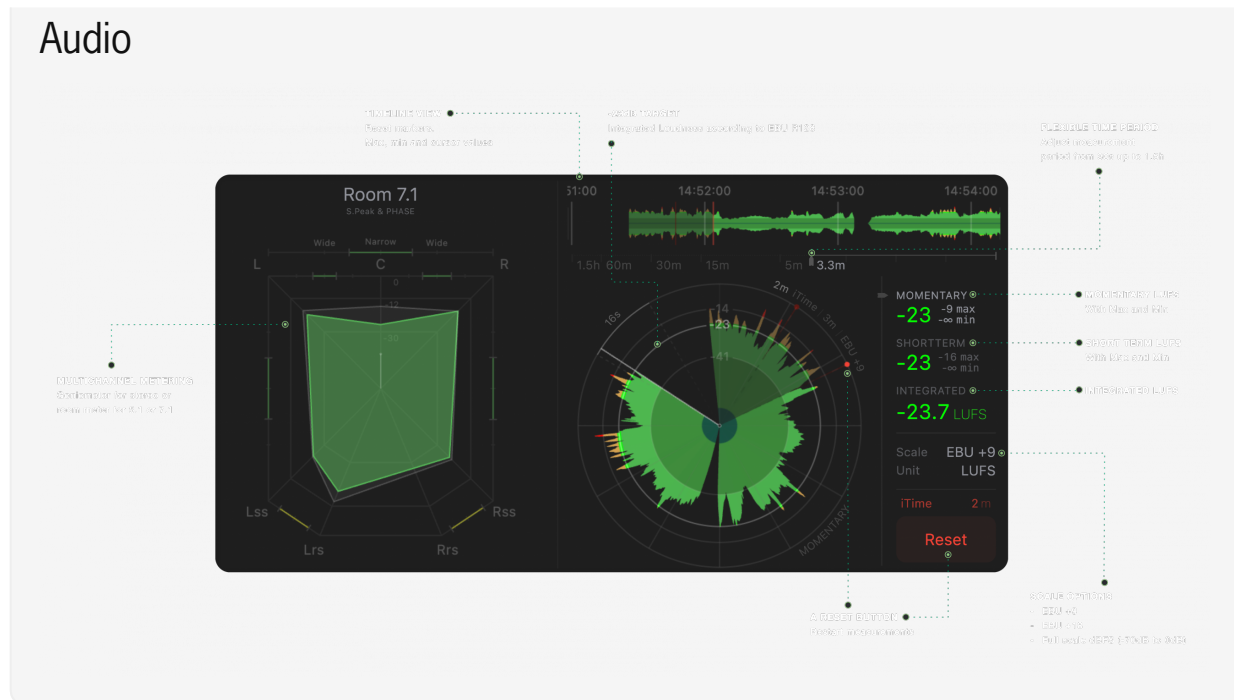


Audio Metering

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.



Audio



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

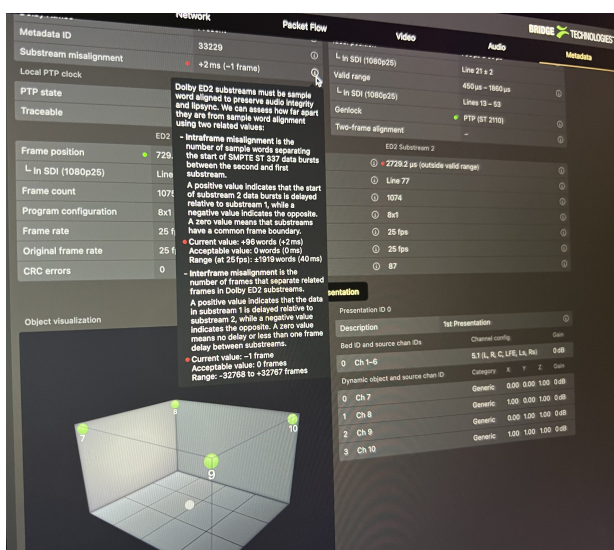
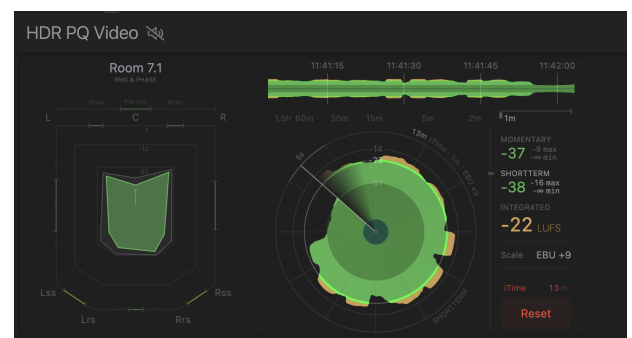
The VB440 facilitates measurement of



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.

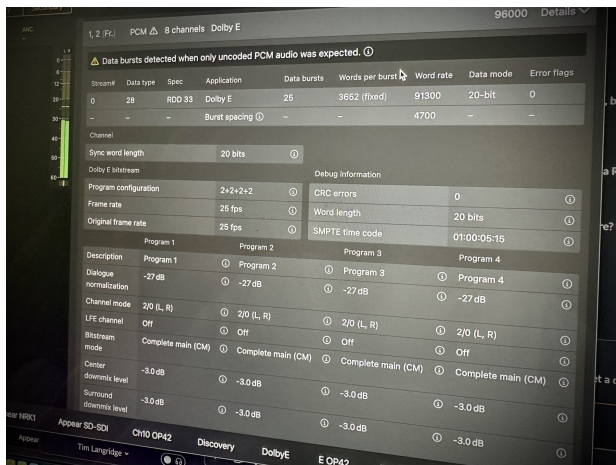
Audio Meters

The VB440 incorporates an extensive range of audio metering tools, including LUFS, Gonio, room, and sample peak meters. The sample peak meters feature peak hold and carefully tuned ballistics for accurate level monitoring, with a sub-5 ms fast attack capturing fast transients. All metering conforms to the IEC 60268-18 digital scale standard.



Dolby® standards

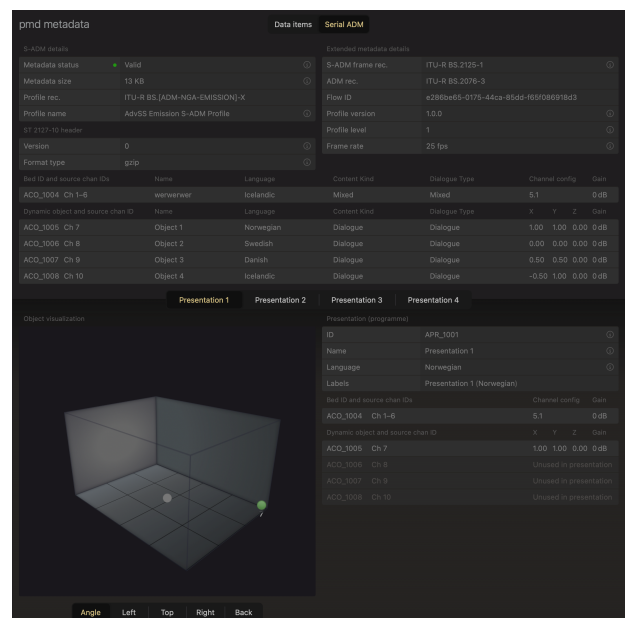
Dolby® has led the way in audio standards for more than half a century, and continues to pioneer new ways of audio listening - particularly with the introduction of Dolby Atmos®. Thus, as the leading monitoring probe for IP production, it is only natural that Bridge's VB440 incorporates monitoring for the full range of Dolby standards, including Dolby E, Dolby ED2, Dolby Digital, Dolby Digital Plus™ and Dolby Atmos®. This monitoring is facilitated firstly through Bridge's range of audio



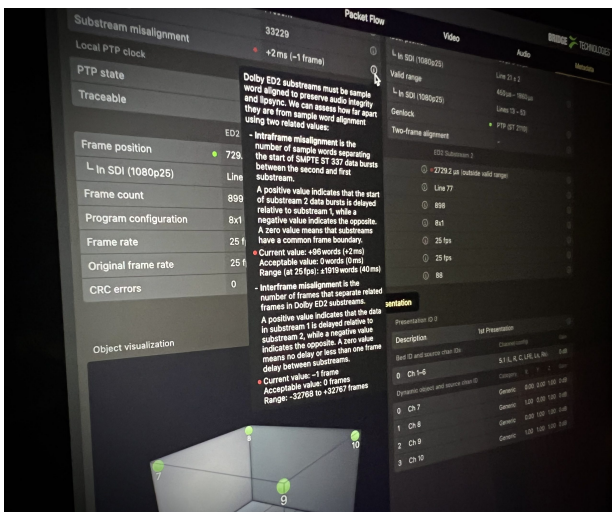
visualisations and room metres, and now covers a practically unlimited number of flows in a service, each capable of maintaining 64 channels in any audio bond grouping, together with presentations and objects. More than this though, it allows for a unique range of listening options, all of which can be easily listened to using just a set of headphones or through any HTML-5 enabled browser. This includes both single channel isolation for precision sound identification, and the creation of a stereo downmix. This means that audio engineers can carry out their work on a remote and distributed basis, using a full range of auditory and visual monitoring tools from anywhere in the world, even in environments not specifically dedicated to sound work.

SADM Monitoring

The VB440 has now included monitoring of ST 2110-31 and -41 SADM for the effective transmission of immersive audio in live, uncompressed production environments. This new capability, which follows on from the incorporation of monitoring for Dolby's full set of audio standards – including ATMOS – is unique to the VB440, and cements the probe's position as the de-facto monitoring probe for IP production environments, particular for broadcasters engaging in immersive audio and live production. In normal cases, immersive audio is rendered and accompanied with an ADM file, which contains the metadata needed to facilitate immersive playback. However, in the case of live production and transmission, the ADM file cannot be constructed and added as a metadata file, it needs to be



serialised in the form of SADP. Two approaches can be used. The first is to use one of the available audio tracks as a data carrier for the metadata. This however carries disadvantages. For uncompressed transmission, the ST 2110-41 standard can be used to construct a separate serialised metadata file and transmit it separately to the audio file, allowing for the transmission of live, uncompressed, immersive audio. However, this approach adds complexity; by separating the audio and its metadata into two transmissions it brings added risk in terms of synchronicity upon delivery. It is exactly this risk which the VB440 is now able to mitigate with its incorporation of ST 2110-41 monitoring and decoding.



Dynamic Explanatory Hovercards

The launch of the hovercards coincides with Bridge's introduction of more in-depth, dynamically changing, readable values, which give a defined numerical value to the status of various IP network components. These change according to the network component being examined (for instance, deep packet analytics, signal integrity, redundancy relationships and PTP clock sync), and are positioned above the array of flow diagrams, waterflow charts and continuous graphs that Bridge has traditionally used to visualize the data. The new Dynamic Explanatory Hovercards sit aside these new numerical readouts, and when accessed give the user the full network component name (rather than its acronym), its purpose and what it signifies about the network, along with real-time, dynamically adjusting formulas which show the method of analysis being

used, and how the actual performance values in-the-moment plug into the equation. Combined with the presence of visual alarms when any of the displayed values exceed parameters, the addition of Dynamic Explanatory Hovercards means that even a non-technician can monitor the outputs of the VB440, keeping an eye on the health and performance of the production network, and understanding not just when an error occurs, but where it is, what it means, and why it matters.

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 Metadata				
Signal Profile			SDR Adjustment	
OETF	S-Log3	ⓘ	Gamma Table	STD 5 ⓘ
Transfer Matrix	BT.2020	ⓘ	Gamma Step	0.45 ⓘ
Color Gamut	WIDE-BC	ⓘ	Gamma Level	1.00 ⓘ
HDR/SDR Relationship			Knee	ON ⓘ
Conversion Mode	SR AIR ON	ⓘ	Knee Point	90% ⓘ
HDR Look	Live	ⓘ	Knee Slope	0.25 ⓘ
HDR Black Compression	OFF	ⓘ	Knee Saturation	OFF ⓘ
SDR Gain	-6.0 dB	ⓘ	Knee Saturation Level	0.50 ⓘ
Master Black	0.86%	ⓘ	Soft Knee	- ⓘ
HDR Black Offset	Δ 0.00%	ⓘ	Knee Radius	- ⓘ
HDR Adjustment			SDR White Clip	ON ⓘ
HDR Knee	OFF	ⓘ	SDR White Clip Level	104.66% ⓘ
HDR Knee Point	350%	ⓘ	Information	
HDR Knee Slope	0.65	ⓘ	Table Version	V1.10 ⓘ
			HDR Target White	228 nits ⓘ

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.



WIDGETS© API

With the Widgets 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 Widgets™ 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 Widgets, 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 Widget 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. Widgets

make time-critical tasks entirely more achievable.

Orchestration is also significantly improved. With Widgets 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, Widgets 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. Widgets 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. Widgets 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 Widget 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 Widgets, you are the architect, you decide.

Aluminium PoE IV Kits

Redefine production workflows by eliminating the need for cumbersome studio equipment with Bridge Technologies' Aluminium kits for the VB440. Leveraging the VB440's browser-based control, these kits transform an iPad Pro into a powerful, intuitive frontend production tool for creatives and engineers alike. With full Gigabit Ethernet networking and powered by PoE+ the power of the iPad Pro accurate touch and XDR screen capabilities flies.

Kits perfect for VB440 data display

The Instrument View Engine provides deep analytics displays gathered directly from the VB440 Appliance. The separately designed Aluminium 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 Aluminium Kits, the VB440's advanced analytics capability becomes more flexible and easy-to-use.

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.

Precision Display, Precision Control. The aluminium iPad kits deliver unmatched accuracy through the iPad Pro's advanced touch screen and XDR-capable retina display.

With the 11" screen option and exceptional colour accuracy, ultra-fast GPU/CPU performance, and a highly responsive interface, users can rely on precise control and flawless visual representation of VB440 outputs. This ensures that every detail, from flows, waveforms to PTP analysis, is rendered with absolute clarity, allowing for confident and informed decision-making.

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 aluminium kit that fits your space requirements, assemble it, and off you go.





POWER OVER ETHERNET (POE+)

With Power-over-Ethernet (PoE+) capability, Bridge's aluminium iPad kits incorporate a wired Gigabit Ethernet connection, eliminating the need for physical power sockets and ensuring consistent, reliable operation even in environments with limited infrastructure. By reducing cable clutter and enabling power and data through a single connection, PoE enhances flexibility and efficiency in tightly configured production spaces like OB vans or remote setups.

Studio production environments and Outside Broadcast Vehicles

Dual Panel 19" 4RU iPad Pro kit with PoE+



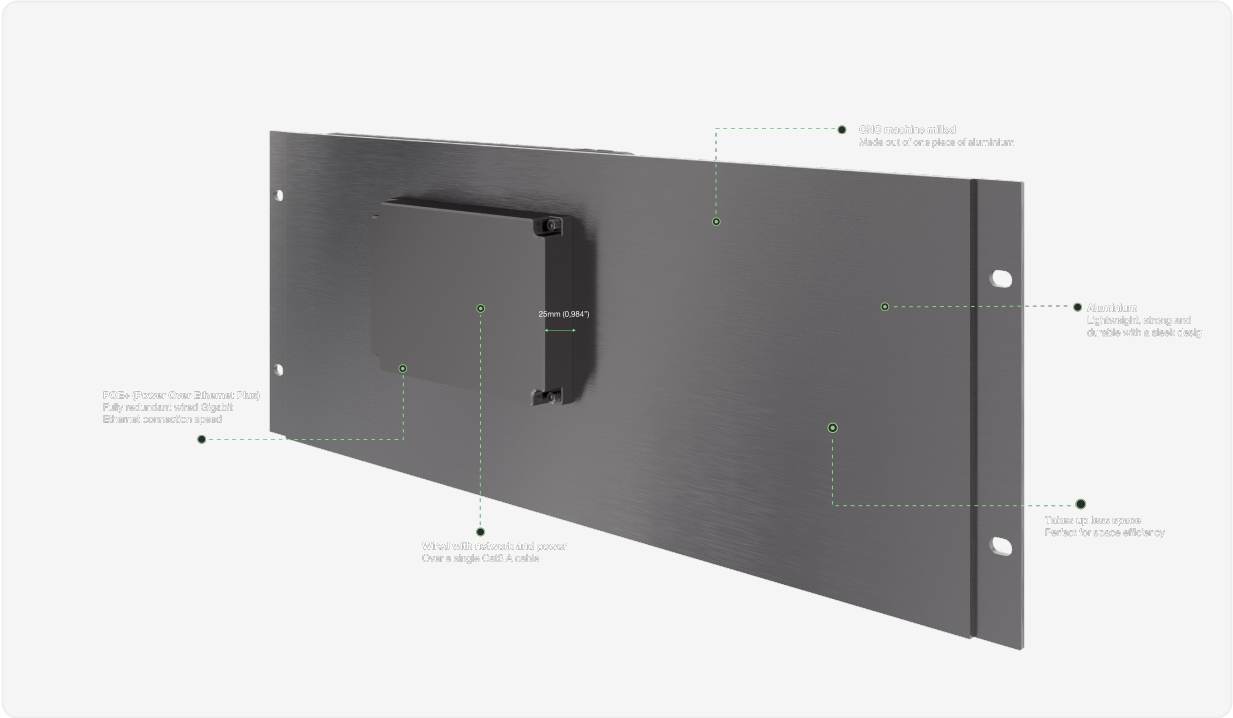
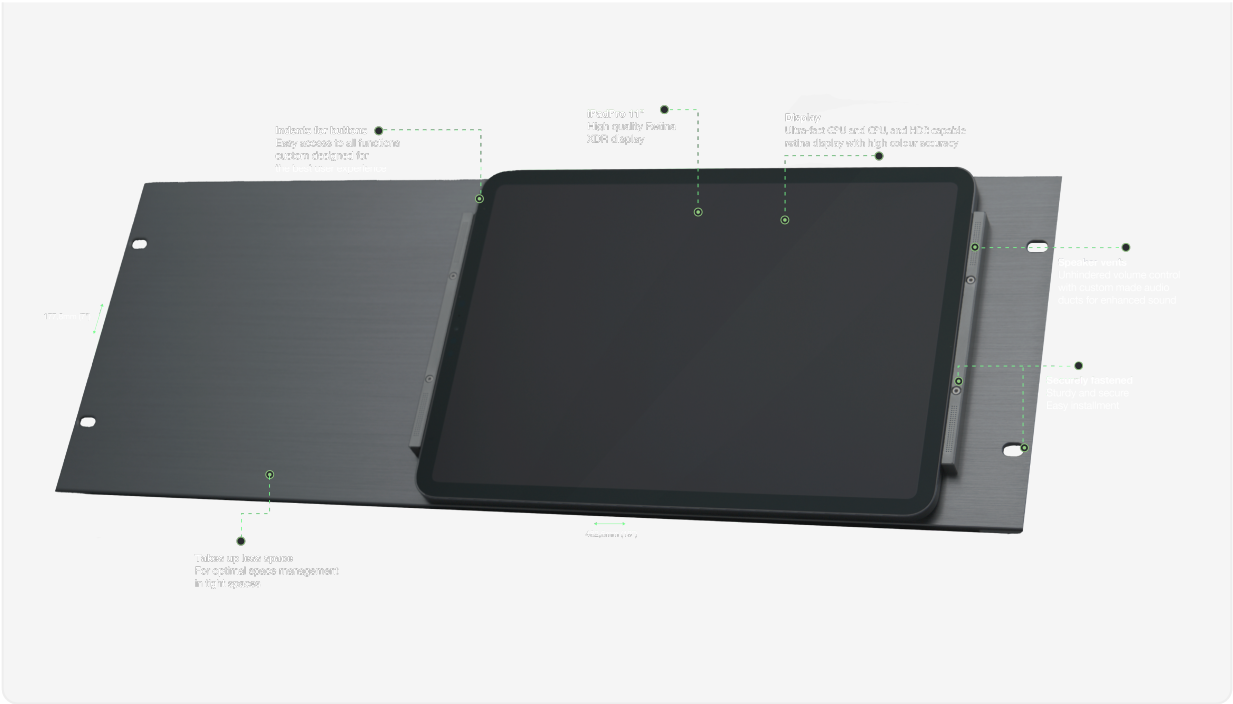
DUAL PANEL

Dual Panel 19" 4RU iPad Pro kit with PoE (Power over Ethernet) – The Instrument View kits come with a Gigabit 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.



Ideal for rack placement in Engineering environments

19" 4RU iPad Pro mounting kit with PoE+



4RU RACK

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.



Control rooms and audio engineering environments

VESA gas arm iPad Pro kit with PoE+

VESA GAS ARM

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. Flexible, space-saving and easy to adjust to any need as you go. When quality and space matters. (Actual gas arm not include)



MCR facilities and remote studio environments

TableTop iPad Pro kit with PoE+





TABLETOP

Award winning original product! TvTechnology "BEST OF SHOW" virtual edition WINNER 2020. – 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.

Seamless Data Networking for Enhanced Performance

A strong and reliable network connection is at the heart of our Aluminium Kits. Designed to take full advantage of advanced networking technology, it ensures your devices remain connected and ready for action at all times.

Reliable Ethernet Connectivity

By leveraging PoE+, our Aluminium Kits provide a stable, high-speed connection, perfect for mission-critical applications like media control rooms, audio engineering work areas, studio locations, OB

vans.

Gigabit Speeds for Maximum Efficiency

With support for Gigabit Ethernet, the Aluminium Kits ensures your iPad Pro 11 operates with lightning-fast data transmission and low latency.

Centralized Network Management

When paired with Power over Ethernet (PoE+), the Aluminium Kits enables centralized control over both power and data. This means you can monitor, update, and manage connected devices easily from your network switch, improving operational efficiency and reducing maintenance time.

Scalability for Expanding Needs

Built with flexibility in mind, our product fits seamlessly into existing network infrastructures and scales effortlessly as your network grows. Whether you're adding more Kits or upgrading your systems, this solution adapts to your needs without disruption.

Enhanced Security

Wired Ethernet connections inherently offer better security than wireless networks, ensuring that sensitive data remains safe. For production teams, our Aluminium Kits provides peace of mind.

A Future-Proof Solution

As technology evolves, our Ethernet-enabled Kits stays ahead of the curve. With industry-standard networking features, it's ready to support next-generation systems and integrations, ensuring your investment stands the test of time.

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

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.

Considering the environment in the design, manufacture and distribution process

Our engineers are encouraged and incentivized to think sustainably in their design process, not only in terms of the function of the product, but in its materials and manufacture. Bridge has sought out manufacturing partners for their full range of probes with a key focus on the environmental credentials of those manufacturers. Mechanized processes designed to maximise efficiency sit at the heart of the manufacturing processes, particularly in relation to PCBs.

Moreover, since 2008, Bridge has shipped all of its equipment to customers using fully recyclable packaging, with organic ink used for all printed materials.

Technical specifications

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

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 – SDI over IP, 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 with JPEG XS

SMPTE RP 2110-25 – Timing

SMPTE ST 2110-31 – AES3 transport containing uncompressed PCM audio or compressed Dolby Audio™ formats

SMPTE ST 2110-41 – Fast Metadata

VSF TR-07/ TR-08 – JPEG-XS can be transmitted as ST 2110 (VSF TR-08) or encapsulated in MPEG-2 Transport Stream (VSF TR-07)

VSF TR-10-0/1/2/3/4/7/11/12 – VSF IPMX suite of standards for uncompressed and compressed flows of Video, Audio and Ancillary data

OP-42/EN 300 706/ OP-47/SMPTE RDD 8/ CEA 608/ ST 334-1/ CEA 708/ SMPTE ST2031 – Subtitles / Closed Captioning

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

Serial ADM – ST 2110-31 data channels according to ST 2116

Serial ADM – support for decoding Serial ADM data items sent using ST 2110-41 Fast metadata according to ST 2127-2

NMOS – IS-04/05/07/09 support

CURRENT SUPPORTED VIDEO FORMATS

Displayed spec info: Format, Colour Space, Sample Structure, Bits and Frame/Filed 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)	8/10/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	1080i	YCbCr	(4:2:2)	8/10/16	50/59.94
	1080p	YCbCr	(4:2:2)	8/10/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	720p	RGB	(4:4:4)	8/10/12/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	1080p	RGB	(4:4:4)	8/10/12/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
UHD Ultra High Definition	2160p	YCbCr	(4:2:2)	8/10/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	DCI-4K	YCbCr	(4:2:2)	8/10/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	2160p	RGB	(4:4:4)	8/10/12/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60
	DCI-4K	RGB	(4:4:4)	8/10/12/16	23.98/24/25/29.97/30/47.95/48/50/59.94/60

SUPPORTED VIDEO FORMATS FOR REMOTE VIEWING

Displayed spec info: Transport, Sampling, Bits and Resolutions

ST 2022-6 (SDI/IP)	YCbCr (4:2:2)	8, 10	SD: 480i, 576i HD: 720p, 1080i, 1080p, 1080PsF, 2Kp, 2KPsF Frame Rates: 23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60 fps
ST 2110-20 TR-10-2 (IPMX)	YCbCr (4:2:2)	8, 10, 16	All VSF TR-05:2018 formats
			Any resolution up to 4K (4096×2160) at any frame rate up to 60
			Resolutions up to 8K at 15 fps
ST 2110-20 TR-10-2 (IPMX)	RGB (4:4:4)	8, 10, 12, 16	Any resolution up to 4K (4096×2160) at any frame rate up to 60
ST 2110-22 JPEG XS	YCbCr (4:2:2)	8, 10, 12, 14	<= 4K (4096×2160) @ 60 fps

All formats support Rec. 601, Rec. 709, Rec. 2020, P3-DCI, and P3-D65 color spaces using SDR, HDR PQ, HDR HLG, HDR S-Log3 or DCI transfer characteristics.

CURRENT SUPPORTED AUDIO FORMATS

Displayed spec info: Sample Rates, Bits and 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

Displayed spec info: Transport, Bits and Sample Rate

ST 2022-6 (SDI/IP)	20-bit	48 kHz
	24-bit	44.1 kHz, 48 kHz, 96 kHz
AES67 ST 2110-30 (PCM/IP)	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	44.1 kHz, 48 kHz, 96 kHz
ST 2022-6 (AES3/SDI) ST 2110-31 (AES3/IP)	AC-3 (Dolby Digital)	48 kHz
	E-AC-3 (Dolby Digital Plus™)	
	E-AC-3-JOC (Dolby Digital Plus™ with Dolby Atmos™)	
AES67 ST 2022-6 (AES3/SDI) ST 2110-30 (PCM/IP) ST 2110-31 (AES3/IP)	Dolby E	48 kHz
	Dolby ED2	

SUPPORTED AUDIO CHANNEL MIXING

Displayed spec info: Source, Destination/Browser and Mixing Rules

Stereo (ST)	Mono	$M = 0.5(L + R)$
Stereo (ST)	Stereo	Passthrough
Quad (U4)	Stereo	$L = 0.5(L + Ls)$ $R = 0.5(R + Rs)$
5.1 Surround (51)	Stereo	$L = L + 0.5(C + Ls)$ $R = R + 0.5(C + Rs)$ 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	$L = L + 0.5C$ $R = R + 0.5C$ $Ls = L$ $Rs = R$ 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	=
		=
		= C
		=
		$Ls = Lss + Lr$
		$Rs = Rss + Rr$
5.1.2 Surround 5.1.4 Surround 7.1.4 Surround 9.1.6 Surround	Audio metering of these surround layouts are supported when signalled via Dolby metadata or S-ADM in current release A future release may add support for transport over PCM via manual configuration or future extensions to SDP channel mappings	
22.2 Surround	Audio metering support	

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 DOLBY AUDIO MIXING/RENDERING

Displayed spec info: Source, Destination/Browser and Mixing Rules

Dolby Digital	Stereo Stereo (Lo/Ro preference) Stereo (Lt/Rt preference) 5.1	Downmix, upmix or rendering according to audio metadata and output speaker configuration Stereo downmix has option for metadata- based or manual selection of Lo/Ro or Lt/Rt
Dolby Digital Plus™		
Dolby Digital Plus™ with Dolby Atmos		
Dolby E		
Dolby ED2		
Serial ADM (S-ADM)		

SUPPORTED ANCILLARY DECODING

Displayed spec info: Transport, Specification and 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
	OP42 / EN 300 706	Teletext subtitles in VBI (SD-SDI only)
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
	RP 165	Error Detection and Handling
	SR Live Metadata	Sony SR Live for HDR
	Private	DID 53h SDID 49h as Service ID (UTF-8)
ST 2022-6 (AES3/SDI) ST 2110-31 (AES3/IP)	ST 337	Any ST 337 data type present in the signal will be listed. Additional processing is performed for Dolby Audio data
AES67 ST 2022-6 (AES3/SDI) ST 2110-30 (PCM/IP) ST 2110-31 (AES3/IP)	ST 337 Annex A	Non-standard carriage of coded audio in PCM channels
ST 2110-31 (AES3/IP)	ST 2116	Serial ADM (S-ADM)
ST 2110-41 (Fast meta- data)	ST 2127-2 (draft), ST 2127-10	

SUPPORTED SIGNAL GENERATOR FORMATS

Displayed spec info: Transport, Format and Comments

ST 2110-20 video YCbCr (4:2:2) 10-bit	1080i: 1920×1080 interlaced	50, 59.94 fields/sec
	1080psf: 1920×1080 progressive segmented frame	23.976, 24, 25, 29.97, 30 frames/sec
	1080p: 1920×1080 progressive	23.976, 24, 25, 29.97, 30, 47.952, 48, 50, 59.94, 60 frames/sec
	2160p: 3840×2160 progressive	
	DCI-4K: 4096×2160 progressive	
ST 2110-30 PCM/IP	16-bit PCM	1–64 channels per stream
	24-bit PCM	
ST 2110-31 AES3/IP	24-bit PCM in AM824/AES3 subframes	2–40 channels per stream Valid channel status word
ST 2110-40 (Ancillary)	ST 12-1 Time code	Time code from PTP time or video burn-in (local time in configurable time zone)

JT-NM Tested

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

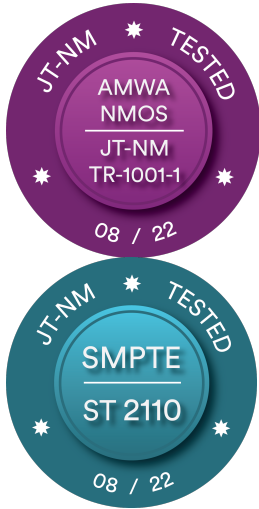
The JT-NM Tested Program again offers documented insight into how vendor equipment conforms to specific SMPTE standards, AMWA NMOS specifications and selected real-world scenarios. The JT-NM (Joint Taskforce on Networked Media) is a self-coordinating group of industry bodies working together on the development 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](#)



iPad Pro MOUNTING BRACKETS FOR IV KITS

11 inch models

Apple sales name	Release date	CPU type	Apple model numbers	Current standard delivery	Mounting bracket/clamps IV-1, 2, 3 (single)	Mounting bracket/clamps IV-4 (double)	Low standoff rebuild kit (IV-4)
iPad Pro 11-inch (M5)	October 22, 2025	Apple M5	A3357, A3358, A3359	Standard	"For 11inch iPad Pro 5th generation M4, IV-1,2,3"	"For 11inch iPad Pro 5th generation M4, IV-4"	IV-4 L
iPad Pro 11-inch (M4)	May 15, 2024	Apple M4	A2836, A2837, A2006	Standard	"For 11inch iPad Pro 5th generation M4, IV-1,2,3"	"For 11inch iPad Pro 5th generation M4, IV-4"	IV-4 L
iPad Pro 11-inch (4th generation)	October 26, 2022	Apple M2	A2759, A2435, A2761, A2762		"For iPad Pro 4th generation IV-1,2,3"	"For iPad Pro 4th generation IV-4"	IV-4 L
iPad Pro 11-inch (3rd generation)	May 21, 2021	Apple M1	A2377, A2459, A2301, A2460		Obsolete	"For iPad Pro 4th generation IV-4"	IV-4 L
iPad Pro 11-inch (2nd generation)	March 25, 2020	Apple A12Z	A2228, A2068, A2230, A2231		Obsolete	Obsolete	
iPad Pro 11-inch	November 7, 2018	Apple A12X	A1980, A1934, A2013, A1979		Not supported	Not supported	

13 inch models

13 inch iPads are supported on request for larger projects. Please contact Bridgetech TSS for details.

Updated February 2027

[PDF – 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 200G QSFP interfaces for 10G, 25G, 40G, 50G 100G, 200G connectivity
- 2 x 40Gbps (80Gbps) data rate, supporting ST 2022-7
- Two simultaneous Instrument View (IV) users

VB440-40Gbps-OPT – Additional 40Gbps analysis capability

- Increased data rate with 40Gbps. From 2 x 40Gbps (80Gbps) to 2 x 60Gbps (120Gbps)
- 2 x 60Gbps (120Gbps) data rate, supporting ST 2022-7

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. Up to 5 signal generators. Total number of streams: 15 (5 video, 5 audio and 5 ancillary data). Signal generators can be configured in either single or dual (ST 2022-7) mode.

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

DOCUMENTATION

CASE STUDIES

ALL Mobile Video US – [Download](#)

Channel 9 Australia – [Download](#)

Liberty University – [Download](#)

For a copy of the VB440 user manual please contact your sales representative

Click below to learn more about compatible technology options:

[AES67](#)

[MediaWindow™](#)

[PTP](#)

[ST2022-6](#)

[ST2022-7](#)

[ST2110](#)

Environmental

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