BRIDGE TECHNOLOGIES™

VB330



VB330 3
VB330 for broadband and media operators 3
VB330 Appliance 4
VB330 Software 4
VB330 SW – with Cloud Virtualisation 5
VB330 Embedded Hardware 5
Content Timeline 6
Concurrent recording of up to 200 streams 7
TS Playout - Ability to playout transport stream (TS) files across IP networks 8
SCTE 104 and SCTE 35 Marker Monitoring 9
MediaWindow™ 10
Stream Overview 10
Multicast Monitoring 11
Traffic - Microbitrate Bursting 12
JPEG-XS contribution monitoring 13
SRT contribution and cloud monitoring 13
Closed Captions Decoding 14
C-CAP/L2TP for DOCSIS 3.0/3.1 14
View thousands of streams in parallel at a glance 15
Testing according to ETR290 15
Gold TS Protection™ 16
Return Data Path 17
IAT - Histogram 17
Redundancy Monitoring 18
Thumbnails 18
CDN monitoring 19
Encoder Boundary Points 19
Audio Meters 19
Technical specifications 21
VB330 21
PHYSICAL SPECIFICATIONS 24
ORDERING CODES 24
DOCUMENTATION 28

BRIDGE TECHNOLOGIES™

VB330

VB330 for broadband and media operators

The VB330 represents one of the most comprehensive media monitoring tools on the market both in terms of capability and capacity. With dual 100-Gigabit Ethernet connectivity and a massive multi-processor architecture the VB330 can deliver monitoring and analysis of thousands of streams and a multitude of technologies in real-time and in parallel.

The VB330 offers platform flexibility. Deploy it either as a pre-configured Appliance server, a telecom-grade dedicated hardware blade or as a pure software solution either on your own server hardware or in the Cloud via cloud hosting services such as AWS. Optimize traits such as power consumption, hardware longevity, scalability and raw performance.

Regardless of the deployment option chosen, feature parity is maintained across all platforms. The intuitive GUI can be accessed from anywhere in the world with next-to-no-latency over any HTML-5 capable browser.

Designed to help media and broadband providers of all types deliver exceptional Quality of Service (QoS) and Quality of Experience (QoE) to their end users, the VB330 represents an indispensable tool in increasingly competitive markets, where margins for technical error are close to zero.

Designed as a multi-purpose tool capable of monitoring IP multicast, video OTT/ABR streaming, video-on-demand unicast, Ethernet trunk micro bursts, PCAP recording, L2TP unpacking and monitoring and general traffic protocol inspection, the VB330 is highly customizable, allowing users to set alarms for a comprehensive range of potential errors according to need.

Some focus areas include OTT/ABR QoS transport and manifests, freeze Frame and signal loss, audio level, QoE MOS score, ETSI TR 101 290 with Gold TS reference, SCTE35/104 ad insertion, IP jitter, packet loss, OTT profile alignment, SRT and closed caption verifications.

VB330 supports the full-range of signal formats found in any media operation, including HDS, HLS, MSS, MPEG-DASH, MPEG TS, as well as all common compression standards – including JPEG XS.

Combined with the Video Bridge Controller (VBC) multiple VB330 probes can quickly and easily be managed with a minimum of setup and configuration effort. Add the management address of the VB330 and instantly gain powerful features such as SLA reports, Dashboards and alarm trending.

The VB330 represents a truly flexible, versatile and comprehensive monitoring solution for networks of any configuration or size.

Choose your platform

The VB330 is deployed either on dedicated embedded hardware, as a pre-configured and pre-installed appliance or as a software-only solution on your own server hardware or in the Cloud. This gives the operator unique flexibility when it comes to tailoring the monitoring solution towards the underlying system architecture in the best possible manner. Feature parity is ensured across the various deployment options, varying only in factors such as scalability, power consumption and longevity. The web-based user experience and feature availability stays the same across all the deployment alternatives

VB330 Appliance



Providing the highest capacity of the three installation options the VB330 Appliance server is highly future proof in terms of scalability due to its massive parallel CPU resources and dual 100Gpbs network interface capabilities. The VB330 Appliance option runs on a pre-selected, Bridge-supplied server platform. The current appliance platform incorporates an Intel Xeon 24-core CPU, 96GB DDR RAM, 960GB solid state disk, Dual 10/25/40/50/100Gbps network interface card and dual PSU. The VB330 Appliance sports a custom-designed aluminium server front – a thing of beauty. The VB330 Appliance provides a maximum of functionality with the minimum of fuss, centralizing monitoring activities whilst still providing next-to- no-latency visualization of the end-to-end media chain.

VB330 Software

The VB330 probe is also available as software that can be installed on suitable server hardware or in virtual machine environments by the end user. This potentially opens up the VB330 probe



to be run on any Intel-based server infrastructure available. Some consideration is required in order to match software driver capabilities against the server hardware to run the VB330 on, especially the network card and the memory.

VB330 SW – with Cloud Virtualisation

The VB330 probe software image makes deployment also in cloud environments possible. A flexible licensing arrangement allows for redundancy scenarios and machine-movable license options. Suitable tailor-made VB330 machine images have been made available for this reason. The ability of the VB330 to operate on a virtualized cloud environment also means that full VB330 functionality will be available through major cloud-based web service providers.





VB330 Embedded Hardware

The VB330 embedded probe is a dedicated dual 10G blade developed by Bridge Technologies that fits the standard 1RU Dual-PSU chassis. The VB330 hardware blade is designed with telecom-grade longevity in mind with MTBF figures in excess of 15 years and a power consumption of less than 35 Watts per blade as key design criteria. Two VB330 blades can be fitted in one 1RU chassis. The embedded VB330 solution presents the ideal option for applications in networks where concerns over energy drawn and rack space might constitute a concern.

QoE & QoS content monitoring

The VB330 provides in-depth analysis for detailed understanding of data for error, jitter, dropped packets, latency and low throughput analysis, producing hard, empirical QoE & QoS data – without the false positives. In the connected media consumption landscape, there's a vast amount of data for you to access, understand – and act on. The enormous volumes of data available need exceptional analytical tools if the data is to make sense.

QoE Content monitoring

Whilst vital to network operations, the listed QoS measures represent only half of the VB330's functionality. What matters to audiences is their ultimate user experience, not the technicalities of network performance. As such, unlike many monitoring solutions in the market, the VB330 places a deliberate focus on established the end user's Quality of Experience (QoE). Positioning itself in the last mile, through Content Extraction it can detect and alarm MOS average, VMAF scoring, freeze-frame/color-freeze error, audio level and stereo phase issues and real-time loudness. It can also engage in closed caption extraction (CEA-608/CEA708), and deliver thumbnail content archiving and timeline visualization.

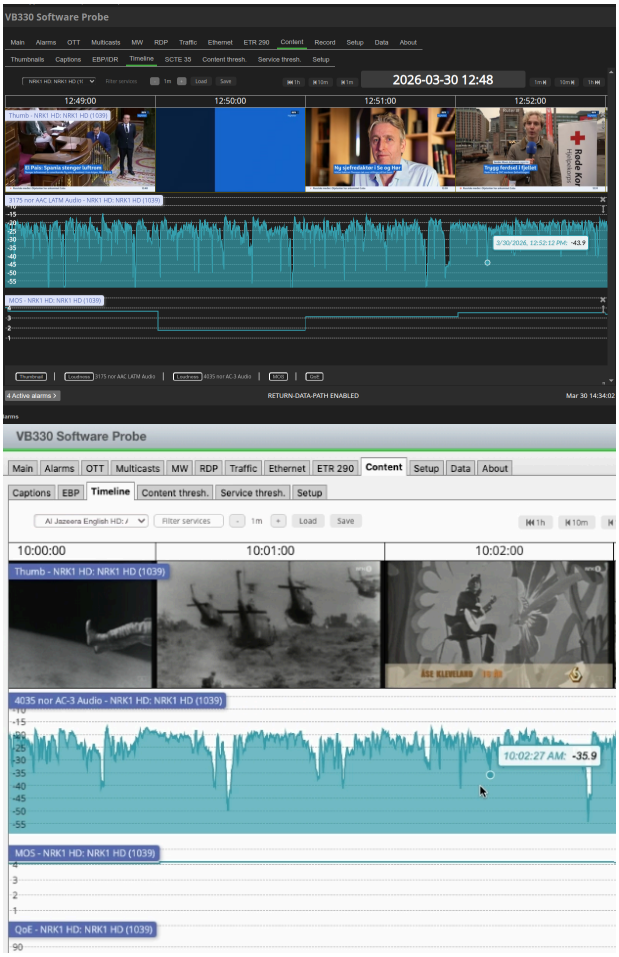
QoS monitoring at the IP and TS level

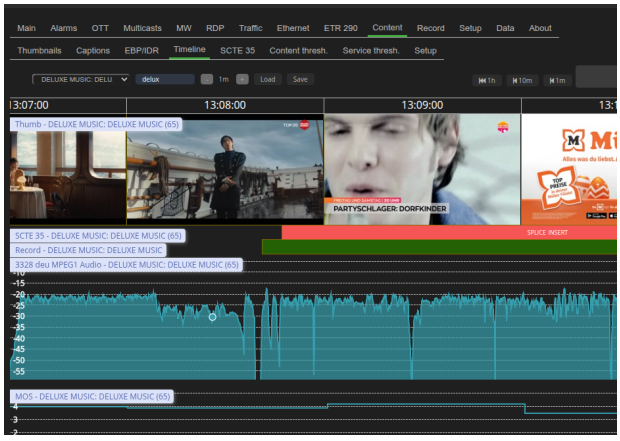
Regardless of whether the video in question is multicast, unicast (OTT/ABR), carried over IP or ASI, through a CDN or directly, and irrespective of compression and TS standard employed, the VB330 incorporates all of the tools necessary to monitor the specific attributes of each type of cast – with insight generated at the IP, TS and Content level. Quality of Service (QoS) monitoring represents the backbone of a comprehensive monitoring solution – understanding network performance along the full media chain; from point-of-origin, through the CDN and across the final mile: uptime, downtime, error rates, bandwidth, latency, profile switching alignment – QoS ensures that network movement is occurring within established parameters, and provides the data that engineers need to identify problem points and engage in strategic improvements.

Content Timeline

The Content Timeline is part of the Content option in the VB330 probe and enables operators to go back and explore, understand, verify and document in complete detail what happened at any given time, or look for patterns over longer

periods of time to identify and eliminate problems. The Timeline shows content thumbnails, alarm markers and all the metrics familiar from the MediaWindow™ displays, making visual navigation through the data simple and quick. Users can drag and drop data tracks to group them in any order for convenience. Engineers can search through the chain of events that led up to service failures, and generate reports for remedial action or fulfilment of regulatory SLA obligations





Concurrent recording of up to 200 streams

The VB330 Appliance and Software solution offers powerful recording of any 200 IP transport streams in parallel. Storage is only limited by disk file system mounted. Each recording can be initiated either manually, by a preset time schedule or by trigger events such as any of the probe alarms or even SCTE35 ad-insert events. For the event triggered recordings a pre-fill buffer is also stored, ensuring the trigger cause itself is captured to the same recording. The concurrent record option comes in steps of 100 up to a total of 200.



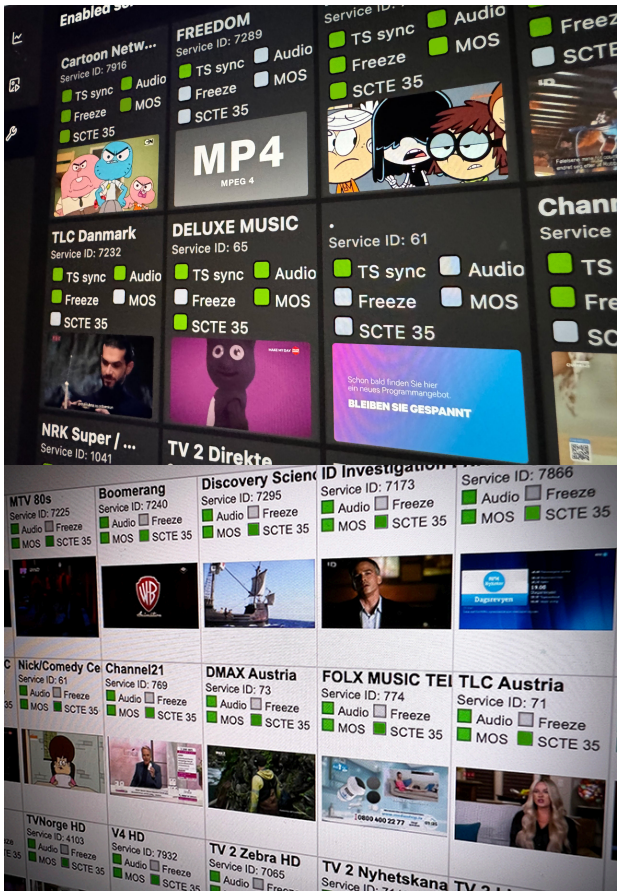
TS Playout - Ability to playout transport stream (TS) files across IP networks





The functionality transforms the VB330-SW probe from a passive monitoring tool into a far more comprehensive, expansive broadcast asset – allowing broadcasters to fulfil a full range of regulatory and compliance activities, as well as vastly improving their technical, operational and strategic decision making. The TS playout feature builds upon the existing recording capabilities of the probe, allowing for round-robin and alarm-triggered recording of up to 200 streams, with an inbuilt clip editor for export. The new TS playout feature expands upon this, taking a recorded stream and playing it out to any TS receiver, supporting bitrates up to 100 Mbps per stream with up to 12 simultaneous playouts and a total throughput of 1 Gbps (or 2 Gbps with ST 2022-7 redundancy activated). The probes support both Single Program Transport Streams (SPTS) and Multiple Program Transport Streams (MPTS), as well as both Constant Bit Rate (CBR) and Variable Bit Rate (VBR) files. Streams can be played once or set to loop with adaptive handling to avoid

continuity counter errors and can be sent to either multicast or unicast destinations. For multicast delivery, the probe can also monitor its own output using its full built-in analysis toolset. Files can be uploaded via the web interface, and recordings made by the probe can be used directly as playout sources.



SCTE 104 and SCTE 35 Marker Monitoring

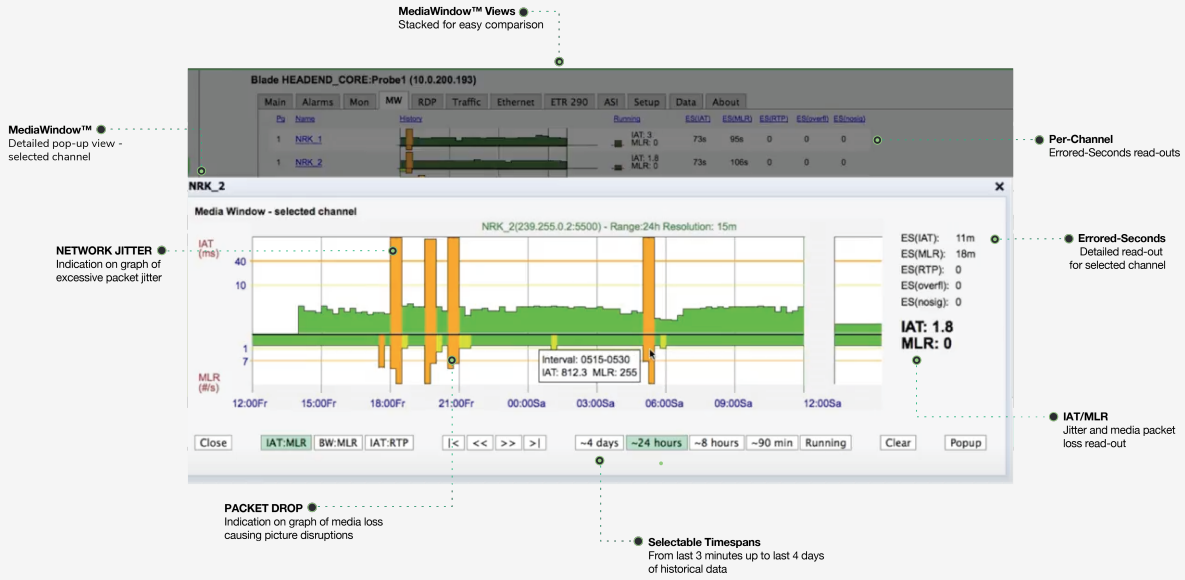
The capability of monitoring ad inserts is of particular importance in order to safeguard the revenue flow of any media operation relying on commercials as an income. Advertising breaks are typically signalled using either the SCTE-104 (uncompressed) or SCTE-35 (compressed) standards. These standards describe messages – or events – that flow together with the main signal telling downstream equipment when to switch in and out advertising content. The VB330 contains full support for monitoring SCTE-104 carried inside ST.2038 or SCTE-35 directly in all the 2000 IP transport streams as well as the up to 1000 ABR/OTT unicast streams. Events are logged internally in the probe and also visualised in the content timeline view. Relevant alarms are generated in case of erroneous syntax or mismatching timing.

Patented Visualisation

The VB330 contains unique visualisation technologies such as the MediaWindow™ and the microETR™. The MediaWindow allows the operator to gain key knowledge about the carriage quality of the media multicasts over time selectable time intervals. Color-coded graphs give an intuitive feel

for how well the signal behaves in terms of QoS parameters such as packet loss and packet jitter. The microETR™ deals with transport streams and allows for the real-time alarm state of hundreds of media streams to be viewed in a single view. This allows for faults to be spotted and pinpointed in seconds. Together these techniques result in a graphical user interface that is packed with essential information, yet intuitive and easy to read.

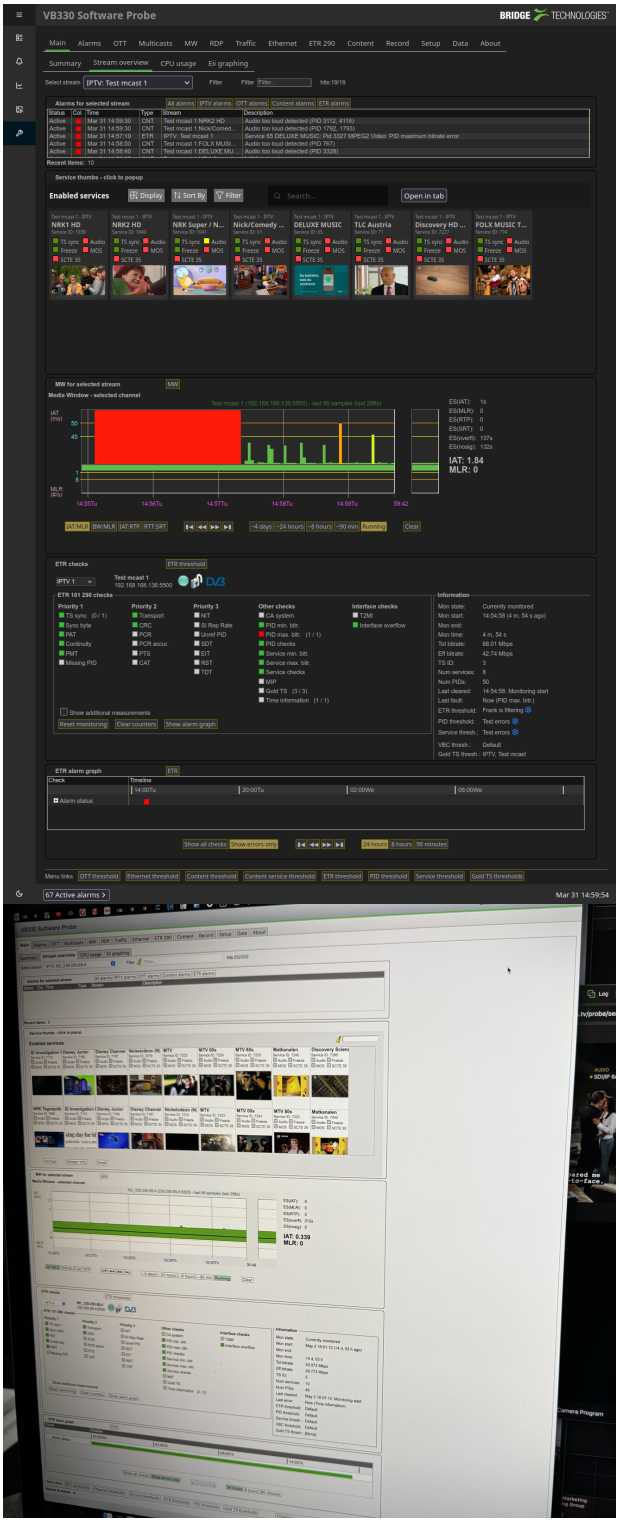
MediaWindow™



Stream Overview

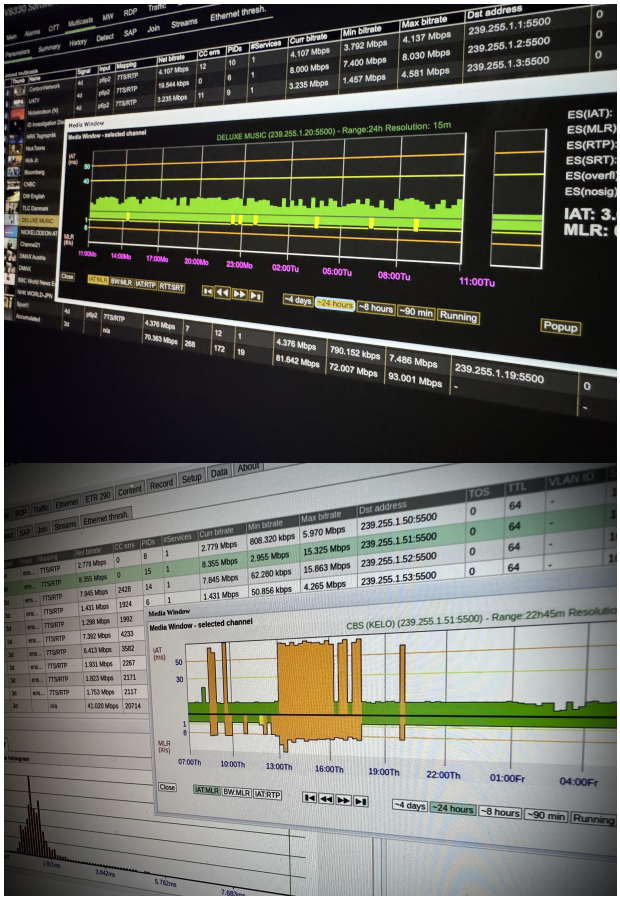
'StreamOverview' functionality, introduced to the VB330 as a part of the version 6.3 upgrade, represents a new way of obtaining at-a-glance insight into the performance of a single channel, so that it can be assessed and troubleshooted as and when problems occur. It provides a simplified view of each channel in accordance with the needs of first- and second-line problem solvers, providing exactly the data required and nothing

more, in a manner that is instantly accessible and highly intuitive. A high-speed search bar and drop-down list allow for the user to instantly target a problem channel and select it, with that channel's information automatically updated to show all relevant monitoring data for that channel alone. The nature of this data changes according to whether the stream in question is RF, IPTV multicast or OTT/ABR. Thus, in the case of IPTV/multicast, the user is presented with a summary of the alarms that have been applied to the channel, their status, a thumbnail and various QoE parameters – including MOS score, along with other relevant data such as the latest SCTE 35 splice events, video resolution, audio/video codecs, and general stream information. In addition, a MediaWindow™ readout is provided, as well as various ETR 290 parameters and a full ETR 290 history graph. For HLS/DASH streams, a summary of alarms is again presented, along with the OTT profile, including information pertaining to elements such as the video resolution and segment numbers, along with an OTT segment overview with profile health over the last 120 minutes.



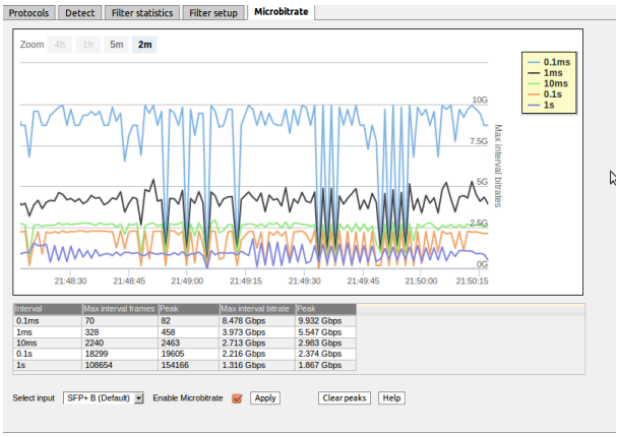
Multicast Monitoring

An extensive range of multicast parameters can be displayed at-a-glance, pertaining to IP, TS,



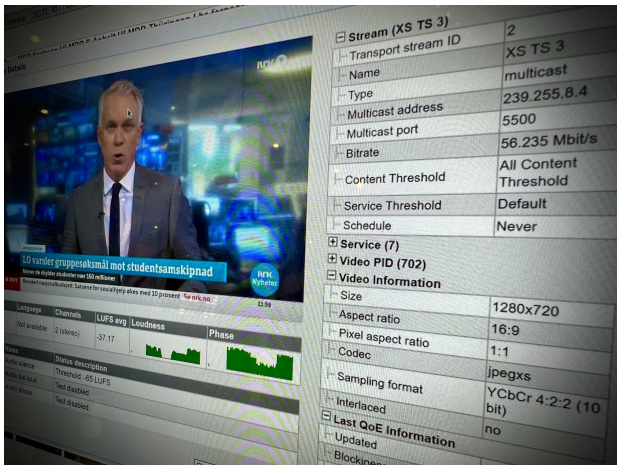
Ethernet, RTP and FEC. Associated thumbnails are also displayed, which can be expanded to produce a more frequently updated single image – or alternatively, display error information in cases where thumbnails cannot be obtained. For each multicast stream, peak and aggregate values for an extensive range of signal, bitrate and packet data are all displayed, up to a duration of four days, customizable according to the user's priorities. The detection and joining of multicasts into the probe is also facilitated in an intuitive and simple-to-achieve manner. The VB330 is capable of monitoring up to 2000 multicast streams concurrently. IGMPv2/3 analysis and logging is provided. Both IPv4 and IPv6 are supported.

Traffic - Microbitrate Bursting



A common problem in any large enterprise or public network infrastructure is the occurrence of packet bursts. These typically happens due to congestion points and resulting packet queues accumulating inside the Ethernet switches and IP routers making up the network. When the network is used to transport video these aberrations can have a particular adverse effect. The VB330 comes with standard built-in support for microbitrate burst monitoring. The feature allows for the whole 10G or 100G Ethernet network trunk to be viewed as one and analyzed for the presence of packet bursts. This unique functionality allows the network engineer to detect the amount of micro bursting and also trend this

over time to spot patterns otherwise very difficult to pinpoint.



JPEG-XS contribution monitoring

The VB330 supports analysis of Transport Streams which incorporate all of the expected JPEG, MPEG and H. compression standards, but crucial to the VB330's market-leading position is its incorporation of developing industry standards across all areas of operation and functionalities. In recent years, in the field of compression, JPEG-XS has risen in significance and market adoption. 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. The VB330 Appliance allows TS monitoring and alarming for bitrate and packet loss analysis, and includes thumbnail decode for validation of the content and multicast data from the JPEG XS stream.

SRT contribution and cloud monitoring

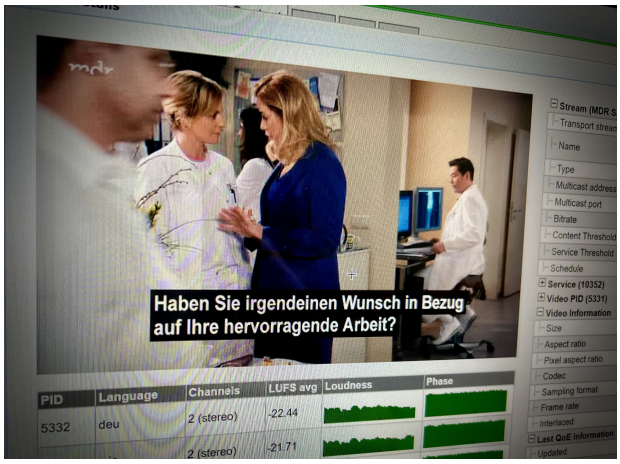
Bridge Technologies is a proud member of the SRT alliance, and recognizes the value that this robust quality, low latency, open source video streaming protocol presents to the industry. The VB330 is capable of receiving up to 200 SRT streams and pass them on to the main monitoring framework for further analysis. This includes MediaWindow visualisation, TR 101 290 analysis, content capture and thumbnail mosaic. Key parameters such as round-time and lost-packets are displayed. The VB330 is further capable of



also sending out two streams formatted as SRT. These are typically used for ad-hoc transport of content for remote viewing and inspection. The VB330 with SRT support is a standard feature of the product.



Alliance for IP Media Solutions

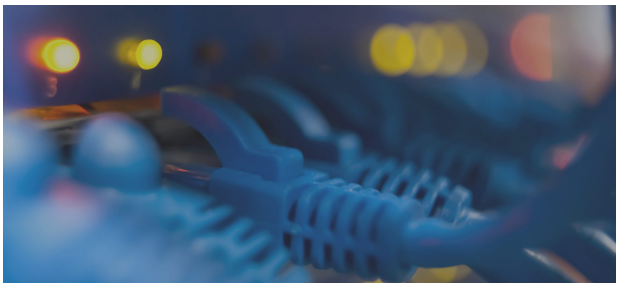


Closed Captions Decoding

Closed captioning CEA-608/CEA-708 are standards relevant to textual description of the content for the hearing impaired. It is mandatory in USA to carry captions on all content and also to ensure that the captions are of technical good quality. The VB330 offers monitoring of CEA-608/CEA-708 captions on all 2000 multicast media streams with logging to database and visualisation in content timeline. Alarms are triggered for a multitude of potential caption fault scenarios.

C-CAP/L2TP for DOCSIS 3.0/3.1

In Cable Networks Remote PHY represents a Distributed Access Architecture option that moves the physical layer from the headend or hub to the edge of the access network, and thus represents an important mechanism for maximizing network efficiency in Hybrid Fiber Coax networks, with the net result being that cable operators are able to achieve higher network performance with lower OpEx, lower CapEx, and an evolutionary path for FTTH. The VB330 comes with full support for Remote PHY/L2TP-based DAAs for IPv4 and IPv6, allowing for the full monitoring of multicasts pointed towards PHY CCAP nodes.



Customisable Alarming and visualization

The VB330 does not simply display in-the-moment network data to network engineers, but allows for the full customization of alarms, thresholds and parameters across nearly every measurement metric available. This allows engineers to prioritise issues and manage their network in the way that best suits their needs. Alarm customization is easy and intuitive, and the readouts simple to understand, and capacity for alarms of different types is maintained independently – with each group maintaining no bearing on the capacity of another; this includes 100 Full Service Monitoring and Microbitrate (FSM) 2500 OTT alarms, 1000 ETR290 alarms, and 2500 System alarms.



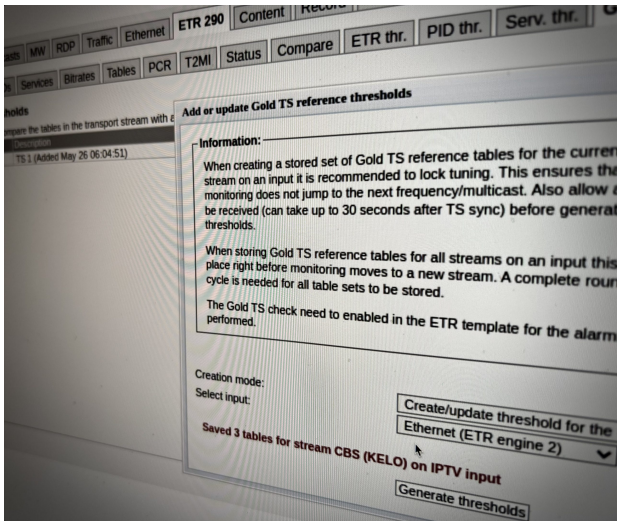
View thousands of streams in parallel at a glance

The microETR™ visualisation technology allows faults to be pinpointed in seconds. The VB330 Appliance and Software solution allows for up to 2000 IP multicasts to be concurrently monitored for QoS-type faults such as packet loss and packet jitter. TR 101 290 analysis can be added on up to 1000 of the IP transport streams in parallel for priority 1, 2 and 3 faults. This includes Gold TS Protection which means a custom PSI/SI table set can be tailored to fit the transport stream and thus reveal faults that would normally not be caught by the standardised TR 101 290 tests. Further, the Content analysis option once activated allows for QoE type monitoring on up to 1000 streams in parallel. This includes MOS scoring, black/freeze-frame alarming, thumbnails in content timeline and audio silence monitoring and alarming. Through license options the VB330 supports monitoring of up to 1000 Channels of OTT traffic with QoE and QoS functionality.

Testing according to ETR290

TR 101 290 testing ensures that the interoperability parameters of TS streams – including intervals, section gaps and tables – are all met. The VB330 maintains capacity for 1000 concurrent ETR290 engines, with the ability for each engine to engage in round-robin testing of four streams for further expansion beyond 1000. It groups errors into Priority 1, 2 and 3 errors, but further allows for the user to fully customize alarming and adapt the thresholds of various ETR290 components.



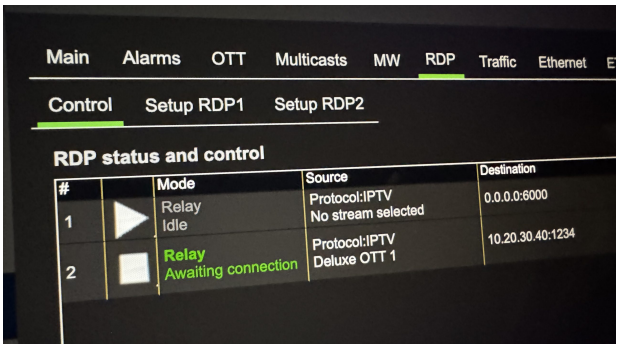


Gold TS Protection™

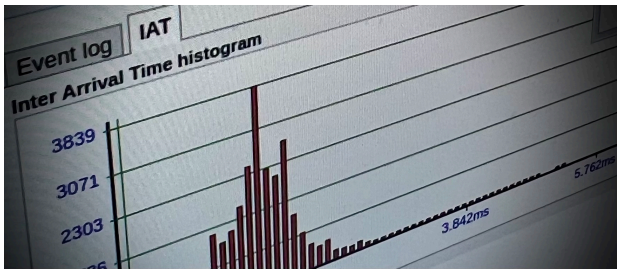
Gold TS protection represents an upgrade on the established TR 101 290 standard, including testing for critical conditions that are not covered under ETR290 testing, whilst also making fault tracking much faster, more accurate and secure. It includes identification of failures – all of which are vital real-world quality assurance elements that have direct effect on end-user subscribers. For operators of digital media services Gold TS saves significant time in setup and diagnosis. Easier setup is facilitated through the use of a much faster calibration process than that associated with ETR290, by capturing an ideal transport stream and setting this as a reference value. Easier diagnosis is achieved by reducing the huge volumes of data that technical staff are required to wade through, instead replacing this with quick flagging and clear presentation of the error condition with deviation from protection values highlighted, and side-by-side presentation of

correct values. The result is a reduction in time-to-resolve errors of a factor between 10 and 15: meaning Op-Ex is reduced by allowing maintenance staff to effectively monitor larger numbers of streams, whilst quality and reliability of service delivered to subscribers is significantly enhanced.

Return Data Path



With the advent of fully duplex technologies as IP transportation, new features for allowing remote access to regional ingress signals are vital. Return Data Path allows the operator to record video locally on the probe or re-route live video monitored by the probe to a central location for decryption and further analysis. Recording is initiated either directly by the operator or automatically based on pre-defined alarm trigger criteria. RDP reduces the need for truck rolls and otherwise necessary on-site visits, by making available centrally signals that are normally only available locally. RDP™ also facilitates a simpler descrambling process for scrambled signals, by transporting the stream to the NOC, head-end or anywhere else for visual monitoring.



IAT - Histogram

The Inter Arrival Time (IAT) histogram gives you a view of how well the timing of the media multicast received is over time. It shows an accumulated count of the number of IAT measurements that fall within each presented bin interval. Vertical green lines indicate the maximum and minimum IAT

values observed. The user can customize the scales.

Redundancy Monitoring

The IP redundancy switching feature enables the VB330 to function as a control unit for an external redundancy switching device, and is integrated easily with the specification of just a few parameters. The VB330 can then be configured to send switching commands to an external device, based on the alarm settings specified.



OTT/ABR monitoring

The VB330 incorporates powerful OTT/ABR analysis engines which can harness active testing to give deep insight into the performance of adaptive bitrate video distribution, particularly in the field of VoD and Live. The OTT option facilitates monitoring of up to 1000 channels each with an unlimited number of profiles.

Supporting analysis of HDS, HLS, MSS and MPEG-DASH, each OTT Engine operates autonomously and only requires knowledge of the URL from which the media is being fetched. The OTT Engine then parses the manifest file provided by the origin or edge-server, extract the different profiles served, validates syntax, checks chunk counters and then does the same for the individual profiles. Support for AES-based decryption is included as well as an innovative method for customizing the expected format of the manifest files received. Moreover, with this high volume of potential traffic generated by the probe as it performs is monitoring activities, either as an end-user requesting content from the CDN, or as a CDN requesting content from the originating server, the VB330 incorporates a number of ways to reduce the network traffic it generates. This includes the ability to switch off chunk downloads, instead simply validating their presence, rather than their content.

Thumbnails

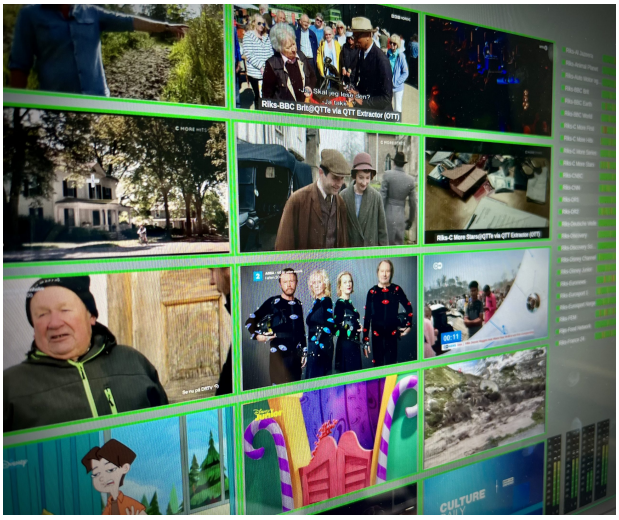
As with the multicast monitoring functionality, thumbnails for every OTT channel are displayed if

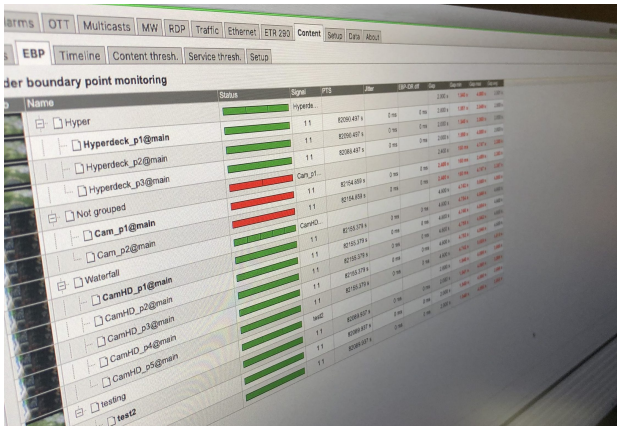


successfully descrambled or available in the clear. These thumbnails can be clicked through to drilled down into for each profile, along with associated data (actual bitrate, expected bitrate, etc) of each profile. Thumbnail update rate is dependent on compression standard and resolution and can be adjusted by the user.

CDN monitoring

The OTT option enables monitoring of up to 1000 OTT channels. OTT engines (depends on license) can operate in parallel, and each engine licensed allows any channels to be analyzed. Each engine analyses channels in series and can be configured with any number of channels up to the maximum allowed by the license.





Encoder Boundary Points

Crucial to the success of OTT VoD delivery is the ability to leverage Adaptive Bit Rate (ABR) streaming, allowing CDNs to provide uninterrupted content delivery to consumers with less manpower and fewer resources. Synchronicity between the various switching profiles is key to this seamless delivery, and the VB330 facilitates full monitoring of the alignment of these profiles through thumbnail analysis and IDR/EBP signalling.

Audio Meters

Audio formats supported on Appliance and Software probes: MPEG1 Audio, AC-3 Audio, E-AC-3 Audio, AAC Audio, AAC LATM Audio, SMPTE PCM Audio Loudness: LUFS/ LKFS According to ITU 1770, ATSC A/85 and EBU R128



Zabbix Integration

Bridge Technologies has successfully completed integration with **Zabbix**, a robust, scalable, and flexible IT monitoring solution that is offered free to users. The integration will now allow Zabbix users ways to access the unmatched depth and breadth of data provided for by Bridge Technologies' monitoring probes, whilst still maintaining the familiarity of the Zabbix platform.

Zabbix is an open-source, enterprise level monitoring solution that offers an overview of IT infrastructure stacks: from servers, virtual machines and network devices to applications, container and cloud infrastructures. Integration with Bridge Technologies allows Zabbix users to access additional metrics on the performance and quality of media services within the context of the overall IT infrastructure, and gain important client-side analysis that can be correlated with that generated by Zabbix's own stack monitoring. Together, they provide for deeper, more comprehensive analytics that facilitate improved fault diagnosis, and provide for historical and trend analysis that can help identify patterns and optimise the performance of media services within the broader IT infrastructure.

Security — Tacacs+

The VB330 uses best practices from the IT industry to ensure continued operational stability and the highest level of protection against attack. The VB330 ensures continued operational stability using HTTPS to secure and encrypt the communications channels, thus practically eliminating the possibility of man-in-the-middle attacks. This provides broadcast facilities with the ability to architect and use IP broadcast capabilities with confidence and ease.

BRIDGE TECHNOLOGIES™

Technical specifications

VB330

KEY FEATURES – VB330 APPLIANCE, VB330 SOFTWARE and VB330 EMBEDDED probes

- Continuous monitoring of up to 2000 IP media multicasts with extraction and monitoring of relevant parameters for the Ethernet, IP, UDP and Transport Stream layers (ETSI TS 102 034)
- MPEG2 (SD/HD), H.264/AVC/MPEG-4 AVC (SD/HD/UHD), MPEG-4p10, H.265/HEVC (8 bit, 10 bit, SD/HD/UHD), JPEG-XS, JPEG-2000 all up to 60fps ***(APPLIANCE and SOFTWARE probes)***
- Support for active testing of up to 1000 OTT/ABR streams ***(500 for EMBEDDED probe)***. No limit on profiles
- TR 101 290 priority 1, 2 and 3 analysis on up to 1000 streams concurrently ***(400 for EMBEDDED probe)***
- Support for Secure Reliable Transport (SRT) with 200 concurrent Receive and 2 concurrent Transmit sessions ***(APPLIANCE and SOFTWARE probes)***
- QoE Content analysis and MOS scoring on up to 1000 streams concurrently with black frame detection and alarming ***(APPLIANCE and SOFTWARE probes)***
- LUFS/LKFS loudness monitoring and alarming on up to 1000 streams ***(APPLIANCE and SOFTWARE probes)***
- Recording option allowing concurrent recording of up to 200 multicast streams for an aggregated bandwidth up to 10Gpbs ***(APPLIANCE and SOFTWARE probe)***
- Innovative multicast collision detect and alarming functionality
- Monitor IEEE 802.3Q VLAN trunks and terminate up to 200 individual VLANs inside probe
- Patented MediaWindow™ visualisation technology for trending packet loss, jitter and bandwidth over time with 4 days of history on all IP multicasts
- Support for IPv4 and IPv6 multicast monitoring and management (IGMPv2/v3 and MLD)
- Passive automatic detection of multicast/unicast streams present on interface
- Active multicast scan and discovery functionality
- Support for Session Announcement Protocol (SAP) for easier multicast stream management
- Protocol hierarchy view with bandwidth and packet count statistics for each active interface
- Web-based management interface for remote access from leading browser platforms

- Security features such as HTTPS using TLS 1.1 and 1.2 with a self-signed certificate
- Limit access to web interface via configurable roles and passwords
- Innovative Remote Data Path (RDP) functionality for relaying any two IP multicasts monitored to central destinations for further analysis. Supports plain TS-into-UDP, TS-into-RTP and SRT (Secure Reliable Transport)
- IGMPv2/v3 protocol logging and analysis framework for multicast fault finding
- Flexible template based alarming system to allow custom configuration of what parameters result in an alarm being generated on a per-TS level
- PCAP capture of up to 2GB of data for further analysis using 3rd party applications such as Wireshark
- Innovative Microbursting jitter analysis for monitoring difficult to detect bandwidth spikes on network interfaces
- MediaKind mediaRoom™ X-bit RTP header extension support
- Alarm on changes to TOS/DSCP and TTL IP header files for detection of changes in network prioritization
- Monitor all received SRT streams using powerful tools such as ETR290 analysis, MediaWindow™ packet drop and jitter analysis, QoE content monitoring and alarming, thumbnail mosaic
- Support for JPEG-XS thumbnail decode and QoE content alarming and analysis ***(APPLIANCE and SOFTWARE probes)***
- Full Service Monitoring of any network device via built-in ICMP and HTTP query agents
- Searchable alarm lists with up to 10,000 alarms stored locally on probe
- Alarm forwarding to 3rd party systems via SNMP TRAP via up to 3 unique destinations or via XML-based polling
- NTP client time synchronization support according to RFC5905 with time zone database download functionality
- DHCP client support on management and video ports according to RFC2131
- Easy web-based software and license upgrade
- XML-based configuration save and retrieval via web
- Powerful and openly available XML-based External Integration Interface (Eii) for 3rd party system integration allowing access to all measurement data inside probe
- Condensed mosaic thumbnail overview of all services monitored with red/green alarm indication
- CMAF HLS and DASH compliance. SmoothStream™, HDS and RTMP support
- Innovative graphical timeline presentation of all OTT/ABR alarms and warnings going back up to 4 days in time
- Transport alarms, HTTP alarms, XML Manifest alarms, QoE content analysis alarms

- Detailed thumbnail view with media structure information and loudness indicators
- Framework for key server access and decryption
- Profile alignment verification with VMAF scoring ***(APPLIANCE and SOFTWARE probes)***
- Innovative Advanced Manifest functionality for 2-step bespoke manifest queries
- OTT/ABR audio Loudness extraction for presentation in Timeline view ***(APPLIANCE and SOFTWARE probes)***
- (EBP) Encoder Boundary points monitoring and Analysis for verification of Segmenter ingest

- Downloads every chunk for analysis
- Unique PTS versus PCR timing analysis for all PIDs within a transport stream for detection of lip sync skew issues
- SCTE35 ad-insert cue tone monitoring, logging and alarming on up to 2000 multicasts and 1000 OTT/ABR streams ***(500 OTT/ABR streams for EMBEDDED probe)***
- Innovative TR 101 290 Gold TS™ Protection with alarming for comparison against pre-recorded stream
- Fully VMware and OpenStack compliant
- Deliverable as ISO installer, OVF image or standalone installer
- Support for L2TP de-encapsulation and TR 101 290 analysis relevant for Remote PHY cable applications as seen in DOCSIS 3.0/3.1 architectures
- Redundancy / 2022-7
- Timeline view with logging going back up to 2 years, depending on storage capacity ***(APPLIANCE and SOFTWARE probe)***
- Timeline zoom levels from 1 second up to 1 hour with date/time selector
- Timeline graphs showing thumbnails, audio loudness, MOS scoring, QoE analysis, SCTE35 events, Recorded files, Caption data, VMAF scoring
- Set up triggered recording based on alarms with pre-trigger buffer fill, configure time scheduled recordings or manually initiate recordings
- Main audio formats supported include MPEG1, AC-3, E-AC-3, AAC, AAC LATM, SMPTE PCM
- Loudness monitoring LUFS / LKFS with alarming according to ITU 1770, ATSC A/85 and EBU R128
- TS RECORD option allows for continuous or alarm-triggered recording of up to 200 transport streams, with an inbuilt clip viewer for file export ***(APPLIANCE and SOFTWARE probe)***
- TS PLAYOUT option supports bitrates up to 100 Mbps per transport stream with up to 12 simultaneous playouts and a total throughput of 1 Gbps (2 Gbps with ST 2022-7 redundancy activated). The probes support both Single Program Transport Streams (SPTS) and Multiple Program Transport Streams (MPTS), as well as both Constant Bit Rate (CBR) and Variable Bit

Rate (VBR) files ***(APPLIANCE and SOFTWARE probe)***

PHYSICAL SPECIFICATIONS

VB330 APPLIANCE

- Operating temperature: 5 to 35
- Storage temperature: -40°C – 70°C
- Operation humidity: 8% – 90% (non-condensing)
- 2 x 100Gbps QSFP Ethernet ports
- 2 RJ45 10GBase-T ports
- 1Gbps RJ45 IPMI port
- Height x Width x Depth: 43 x 437 x 429 mm
- Max power requirement: 400W / 110 – 220VAC / 50-60 Hz
- Weight: 11.2 kg

VB330 EMBEDDED

- Operating temperature: 0 to 45
- Storage temperature: -40 to 70
- Operation humidity: 5% to 95% non-condensing
- 2 x 10Gbps SFP+ Ethernet ports
- 10/100/1000Mbps RJ45 management port
- Initial setup: USB Type A terminal access
- Power dissipated per VB330 module 35W. Up to 2 modules in each 1RU chassis
- Max power requirement fully populated: 80W / 110 – 220VAC / 50-60 Hz
- Standard 19 1RU rack-mount
- W x H x D: 483 x 43 x 400 mm
- Weight: 8.2 kg fully populated

ORDERING CODES

APPLIANCE and SOFTWARE ORDERING CODES

VB330-APPLIANCE

Appliance server assembled and pre-installed ready for use out of the box. Base capacity is up to

2000 multicasts and a total bandwidth capacity of 20Gbit/s

VB330- SW
Software based probe on server and cloud instances provided the underlying hardware is sufficiently dimensioned. (For server specs, please refer to user manual). Base capacity is up to 2000 multicasts and a total bandwidth capacity of 20Gbit/s

PRODUCT OPTION CODES APPLIANCE and SW

VB330-25Gx2-OPT
A new option turning the 20Gbit/s base version into a 50Gbit/s (dual 25Gbit/s) enhanced version. Summation is done across OTT and multicast

ETR290-OPT
ETSI TR 101 290. License for VB330, includes GoldTS, factory ordered

ETR290-UPGR
ETSI TR 101 290. License for VB330, includes GoldTS, upgrade

ETR290-200-OPT
200 engines enabling concurrent TR 101 290 priority 1, 2 and 3 analysis on up to 200 streams. Five of these options can be enabled to give analysis on up to 1000 streams

ETR290-200-UPG
200 engines enabling concurrent TR 101 290 priority 1, 2 and 3 analysis on up to 200 streams – upgrade

ETR290-1000-OPT
For the ultimate in parallel TR 101 290 analysis the ETR290-1000-OPT allows for concurrent priority 1, 2 and 3 analysis on up to 1000 streams

OTT-ENG-OPT
1 engine w/active testing of up to 10 channels, factory ordered

OTT-ENG-UPGR
1 engine w/active testing of up to 10 channels, upgrade

BULK-OTT-OPT
25 engines w/ active testing of up to 250 channels, factory ordered

BULK-OTT-UPGR
25 engines w/ active testing of up to 250 channels, upgrade

T2MI-OPT

DVB-T2MI Encapsulation Synchronisation monitoring option, factory ordered

T2MI-UPGR
DVB-T2MI Encapsulation Synchronisation monitoring option. Upgrade.

SCTE35-OPT
SCTE35 Signalling Analysis and Logging. Factory ordered. Requires v5 sw and ETR Engine

SCTE35-UPGR
SCTE35 Signalling Analysis and Logging. Upgrade. Requires v5 sw and ETR Engine

DATA-LOG-OPT
Offers storage of up to 20000 alarms to disk. Recording of multiple TS and PCAP captures of file size 1500MB to disk. Offers data logging of selected TS measurement parameters to disk

DATA-LOG-UPGR
Offers storage of up to 20000 alarms to disk. Recording of multiple TS and PCAP captures of file size 1500MB to disk. Offers data logging of selected TS measurement parameters to disk. Note: For installation supervision, contact sales rep

CONTENT-OPT
Offers content analysis in the form of QoE monitoring, thumbnail content archiving and timeline visualisation, MOS average alarming, VMAF scoring, freeze-frame/color-freeze detection and alarming, audio level and stereo phase monitoring, real-time loudness monitoring, closed captions extraction (CEA-608/CEA708). Allows for QoE and QoS for up to 1000 streams across OTT and multicast streams pending sufficiently scaled hardware.

CONTENT-UPGR
Offers content analysis in the form of QoE monitoring, thumbnail content archiving and timeline visualisation, MOS average alarming, VMAF scoring, freeze-frame/color-freeze detection and alarming, audio level and stereo phase monitoring, real-time loudness monitoring, closed captions extraction (CEA-608/CEA708). Allows for QoE and QoS for up to 1000 streams across OTT and multicast streams pending sufficiently scaled hardware.

JPEGXS-OPT
The JPEG-XS option enables monitoring and analysis of the JPEG-XS streams embedded in TS

RECORD100-OPT
Triggered recording of 100 concurrent streams. Each probe instance allows for up to two of these for a total of 200 concurrent streams. Total record bandwidth is guaranteed up to 10Gbps.

VB330 EMBEDDED ORDERING CODE

VB330
IP-Probe Blade w/1 active 10GigE SFP+ multimode shipped as standard. NB! Requires EC chassis

PRODUCT OPTION CODES VB330 EMBEDDED

VB33010G2-OPT
Additional 10G SFP+ input for VB330 probe, factory ordered

VB33010G2-UPGR
Additional 10G SFP+ input for VB330 probe, upgrade

ETR290-OPT
ETSI TR 101 290. License for VB330, includes GoldTS, factory ordered

ETR290-UPGR
ETSI TR 101 290. License for VB330, includes GoldTS, upgrade

ETR290-100-OPT
100 engines with testing of ETSI TR 101 290, includes GoldTS, factory ordered

ETR290-100-UPGR
100 engines with testing of ETSI TR 101 290, includes GoldTS, upgrade

OTT-ENG-OPT
1 engine w/active testing of up to 10 channels, factory ordered

OTT-ENG-UPGR
1 engine w/active testing of up to 10 channels, upgrade

BULK-OTT-OPT
25 engines w/ active testing of up to 250 channels, factory ordered

BULK-OTT-UPGR
25 engines w/ active testing of up to 250 channels, upgrade

T2MI-OPT
DVB-T2MI Encapsulation Synchronisation monitoring option, factory ordered

T2MI-UPGR
DVB-T2MI Encapsulation Synchronisation monitoring option. Upgrade.

SCTE35-OPT
SCTE35 Signalling Analysis and Logging. Factory ordered. Requires v5 sw and ETR Engine

SCTE35-UPGR
SCTE35 Signalling Analysis and Logging. Upgrade. Requires v5 sw and ETR Engine

FLASH32-OPT
Flash Storage 32GB Option. Factory ordered

FLASH32-UPGR
Flash Storage 32GB Option. Upgrade

DOCUMENTATION

MANUALS & QSG

Hardware Probe User Manual – **Download**

Software Probe User Manual – **Download**

Quick Start Guide – **Download**

CASE STUDY

NRK Norway (VB330, RDW) – **Download**

Please visit the customer login area next to the main menu for further details and access to software versions

Click below to learn more about compatible technology options:

Eii™
ETR290™
Gold TS
microBURST™
microETR™
OTT
PCAP
RDP
Timeline™

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