

# Qx Series

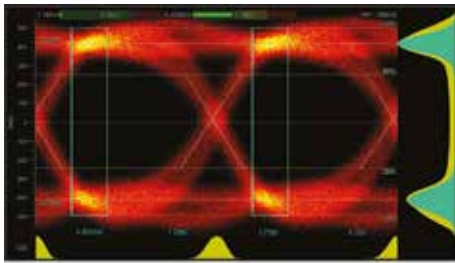
IP/12G-SDI, 4K/UHD, HDR/WCG GENERATION,  
ANALYSIS & MONITORING



# Qx Series

## IP/12G-SDI, 4K/UHD, HDR/WCG Generation, Analysis & Monitoring

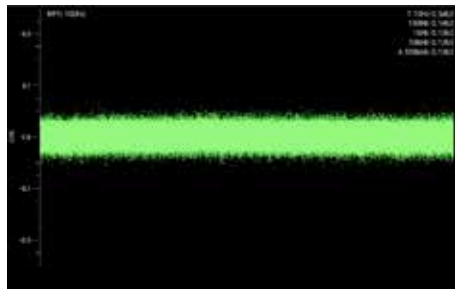
The Qx range brings together all the advanced Test & Measurement tools required for transitioning to the next generation of video formats. The instrument set includes tools for rapid fault diagnosis, compliance monitoring and product development.



### Fast, automated 12G-SDI physical layer analysis

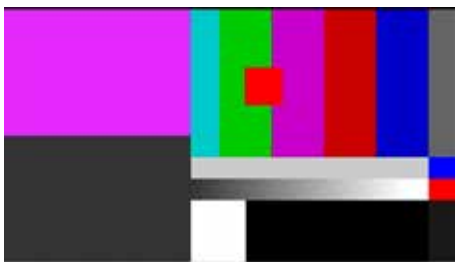
The Qx optional Physical layer Toolset offers the fastest 12G/6G/3G/HD-SDI physical layer testing, with its RTE™ (Real-Time Eye) Technology instantly highlighting any SMPTE compliance issues including eye amplitude, transition times and under/overshoot. Built in automation control allows testing to be performed faster, more reliably and at lower cost.

The real-time eye analysis provides histograms of both the eye Amplitude and Time distributions, and DC coupled automatic measurements of amplitude (mode), positive and negative transition times, jitter health indication and under/overshoot. A single eye with auto centring, or multiple eyes, may be displayed with a choice of color and heat-map overlays and infinite persistence.



The real time SDI jitter analysis tool provides simultaneous monitoring across five specified frequency bands including measurements down to 10Hz, and video trigger options to allow the analysis of time related contributions to the overall jitter measurement.

The advanced SDI-STRESS option is available for stress testing and evaluations of SDI interfaces up to 12G. It includes the ability under automation control to insert SDI clock jitter up to 16 UI from 10Hz to 10MHz, mute any of the SDI outputs, control the SDI scrambler, sync-bit insertion, pre-emphasis, rise time and driver amplitude (+/- 10%). An SDI Pathological Detector provides indication of the rate of generation of pathological conditions, and also the detection of pathological conditions on each active SDI input with real time GPI output for external equipment triggering.



Pseudo-Random Binary Sequence (PRBS) generation and analysis of PRBS-7, 9, 15, 23, 31 allows for deterministic measurement of link Bit Error Rates (BER).

The SDI-STRESS Eye amplitude measurement provides the choice of both Shorth mean and mode with an optional user-defined measurement window for the exploration of eye amplitude.

The Generator Toolset option provides not only the core full screen SDI Pathological SDI stress patterns (Eq, PLL and check field), but also allows the user to define a combination of the SDI stress and conventional generator patterns up to full frame. These patterns can be duplicated on all four SDI outputs.

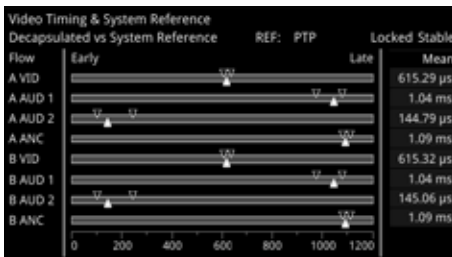
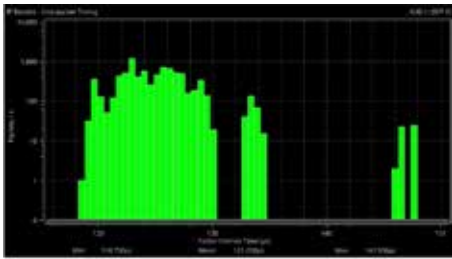
## Hybrid IP/SDI

With the Qx platform you can operate in next generation Hybrid IP/SDI environments that require 4K/UHD (12G/6G/3G-SDI), HD-SDI as well as SMPTE ST 2110, ST 2022-7, ST 2059 (PTP), AMWA NMOS\* and ST 2022-6 formats. Using standard industry SFPs, the core IP toolset provides the user with all of the necessary functionality to request and connect to IP encapsulated media flows and provide the necessary operator confidence status monitoring in an intuitive and accessible manner.

The Qx 2110 “JT-NM Tested”<sup>†</sup> feature set provides ST 2059 (PTP), decapsulation of 1 video, 2 audio and 1 ANC Data flows with support for ST 2110-20 (Uncompressed Video), -30 (PCM Digital Audio), -31 (AES3 Transparent transport) and -40 (ANC Data). ST 2022-7 seamless protection is provided for all four flows over two media network interfaces (two port). Audio reception conforms to 2110-30 Class C with support for 48Khz streams from 1 to 8 channels at packet times of 1ms and 1 to 64 channels at packet times of 125us.

Fast PTP locking time is provided, with a 1PPS GPI output and real-time indication of PTP estimated phase offset. The core 2110 IP toolset also provides indication of the timing relationship of each of the eight 2022-7 flows to PTP with status information, as well as a 2022-7 status tool that reports the health and relative timing skew of each 2022-7 pair. Hardware timestamping ensures accurate timing measurement of incoming packets.

Advanced Qx ST 2110 measurement tools include the provision of up to four simultaneous Packet Interval Timing measurement and displays, detailed data reporting of flow packet, clock rates and PTP timing relationship, as well as IP Receive statistics that includes the measurements of the ST 2110-21 Network Compatibility model (Cinst) and Virtual Receiver Buffer Model (VRX).



## Advanced HDR visualization & analysis toolset

The Qx’s comprehensive High Dynamic Range (HDR) and Wide Color Gamut (WCG) toolset offers instruments to enhance the visualization and analysis of 4K/UHD and HD content to speed workflows. The HDR/WCG tools include a signal generator, CIE chart, Luma false color highlighting or “heat map”, vectorscope and waveform, all supporting Standard Dynamic Range (SDR) BT.709, BT.2020 as well as HDR BT.2100 HLG, BT.2100 PQ and Sony S-Log3 and SR Live. The heat-map provides 7 simultaneous programmable color overlay bands with presets for HDR and SDR ranges (including SR live), plus a user custom preset.

An extensive set of test patterns is provided that include BT.2111 HDR color bars for HLG, PQ and SR live as well as a full set of SDR 709 patterns mapped to each of the four HDR formats for line checks, comparative monitor set-up and the evaluation of HDR to SDR converters. The CIE 1931 x,y display provides overlays for BT.709, BT.2020 and ST.2086 gamut overlays (P3). The Waveform provides a Nits/Cd/m2 graticule along with BT.2048 diffuse white markers.

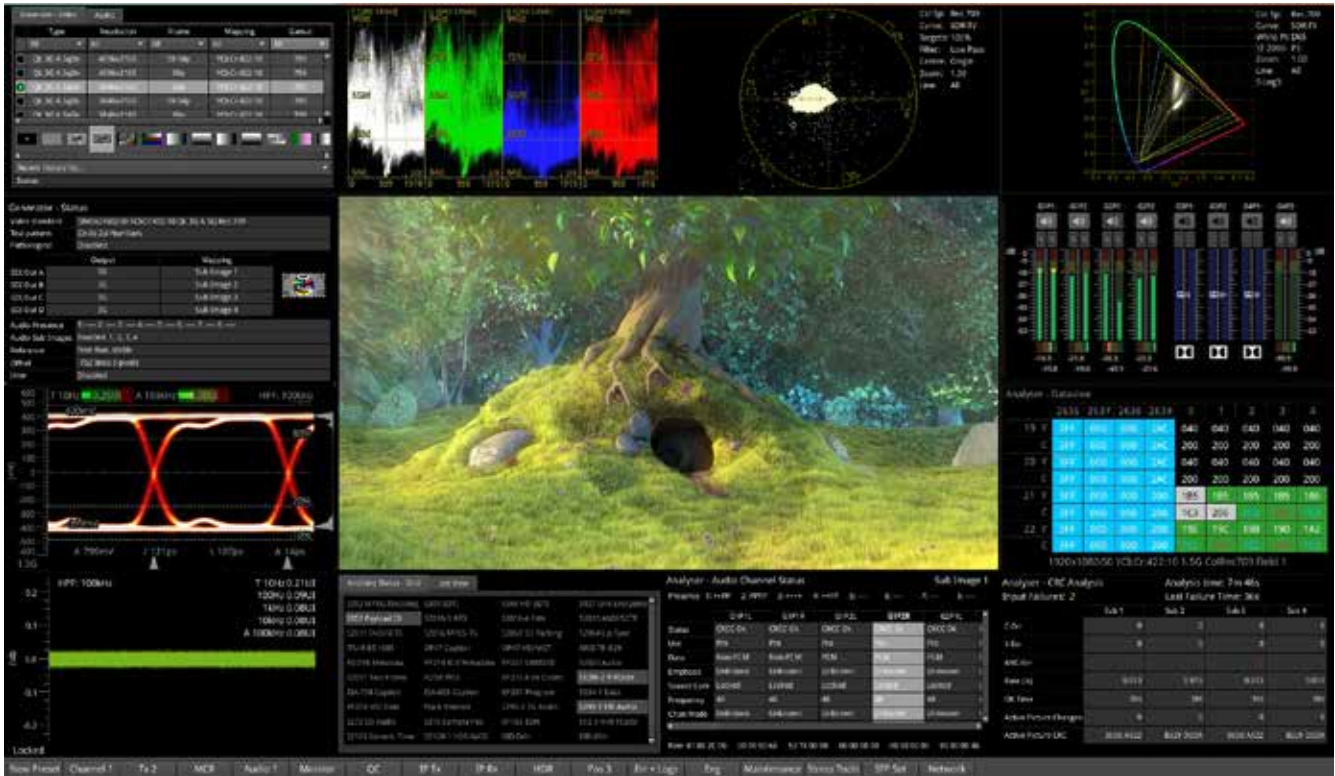
\*Upcoming software release

<sup>†</sup>JT-NM Tested - For more details on the JT-NM Tested program at NAB 2019 and its test results please see [https://jt-nm.org/jt-nm\\_tested](https://jt-nm.org/jt-nm_tested)

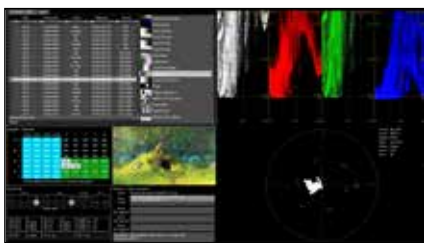
# User-defined Instrument Display Layout

Optimized instrument display with scalable windows to suit individual operators

## SDI Analysis



## Instruments Display



### Display Options

- GUI output rate 50, 59.94, 60 to match video format
- User-selectable colors of window frames for Analyzer and Generator tools
- Brightness control for office or controlled lighting environments

### Presets

- Multiple display layouts can be saved as presets
- This allows users to save bespoke layouts for different operational tasks
- Useful for rapidly changing between different screen layouts eg. Audio, HDR or IP focus

### Up to 16 Instruments

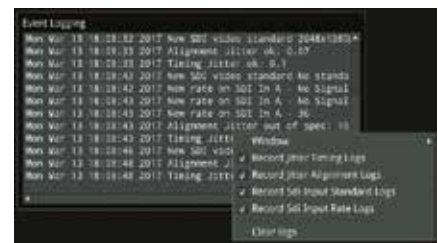
- Fully flexible user-defined instrument layouts
- Display up to 16 instruments on a single 1920x1080 display
- Individual instruments can switch between sixteenth, quarter or full screen (selected instruments)



## IP Analysis



## Control and Logging



### REST API

- The Qx can be controlled remotely over a network via a REST API
- Integrated control, monitoring and automated manufacturer testing

### VNC and Instrument Screenshots

- Interface employs VNC technology to deliver 16 simultaneous scalable instrument windows over a remote network
- SFTP and Browser network access to event logs, screenshots and user presets

### Event Logger

Configurable event log file:

- SDI Input standard/status
- SDI physical layer timing and alignment jitter
- Rest API requests
- IP-Tx, IP-Rx, Flow and SFP records
- Reference Locking
- Audio input presence

# Qx IP

## IP, 3G-SDI + HDR Generation, Analysis & Monitoring



 REAL-TIME EYE

The advanced Qx IP configuration offers hybrid IP/SDI generation, analysis and video/audio monitoring for SMPTE 2110/2022-7 (analysis) with NMOS\* and 2022-6 plus 3G/HD-SDI environments. Designed for IP network traffic analysis and stress testing, the solution is also available with RTE™ (Real-Time Eye) 3G/HD-SDI physical layer testing. Qx IP can be upgraded with a comprehensive HDR/WCG analysis toolset, signal generator and even 12G/6G-SDI performance. An advanced SDI-STRESS option is available for stress testing and evaluation of SDI interfaces up to 12G.

### Key Features

#### IP Generation & Analysis

- SMPTE ST 2110/2022-7 decapsulation and ST 2022-6 encapsulation / decapsulation
- Packet Interval Timing (PIT) analysis histogram for monitoring network traffic
- PIT Logging\* offers effective longer-term network monitoring
- Packet Profile Generator for stress testing video networks (ST 2022-6)
- Stream & network analysis tools
- NMOS IS-04\*, IS-05\*
- Network management multicast support (IGMP v2, v3)

#### 3G-SDI Generation & Analysis

- Simultaneous 3G/HD-SDI generation and analysis
- Waveform monitor for YRGB/YUV monitoring
- Vectorscope for checking color bias / conformity
- Test pattern generation, including Pathological and moving patterns
- 32 channel audio signal generation and embedding
- Video and audio monitoring
- REF locking and timing analysis

#### HDR / WCG Generation & Analysis (option)

- Support for BT. 2100 HLG PQ and Sony S-Log3 and SR Live
- CIE chart (Rec. 709, Rec. 2020, ST 2086)
- HDR Heat-map highlights signals beyond SDR
- HDR test pattern generator
- Waveform with code value and Nits

- Vectorscope with Graticules / Targets for HDR, SDR and Wide Color Gamut
- Waveform ITU-R 2408 diffuse white markers

#### Physical Layer Testing (option)

- HD/3G/6G/12G-SDI RTE™ (Real-Time Eye) options for testing SMPTE compliance issues, including under/overshoot
- Jitter analysis in five specified frequency bands

#### SDI-STRESS (option)

- Advanced Generator tools with PRBS generation, control of SDI driver amplitude and jitter insertion
- PRBS Analyzer
- Pathological Detector

#### System Features

- Logging
- Configuration presets

#### Control

- Remote interface employing VNC technology providing up to 16 simultaneous instrument windows
- TCP/IP interface for remote control and automated testing

#### Form Factor

- Compact ½ 1 RU

\*Upcoming software release

# Qx 12G

IP, 4K/UHD (12G-SDI) + HDR Generation, Analysis & Monitoring



**REAL-TIME EYE**

The top of the range Qx 12G configuration is designed for next generation, hybrid IP/SDI environments using 4K/UHD (12G/6G/3G-SDI) and HD-SDI plus SMPTE 2110 with NMOS\* and 2022-6/7. The high performance Qx 12G offers 4K/UHD-SDI generation, analysis and video/audio monitoring as standard. It's available with ultraresponsive, 12G/6G/3G/HD RTE™ (Real-Time Eye) physical layer testing, and can be upgraded to offer HDR instruments plus advanced IP traffic analysis and stress testing. An advanced SDI-STRESS option is available for stress testing and evaluation of SDI interfaces up to 12G.

## Key Features

### 4K/UHD (12G/6G/3G/HD-SDI) Generation & Analysis

- Simultaneous generation and analysis
- 12-bit YRGB/YUV waveform monitor with H,V zoom
- Vectorscope for checking color bias / conformity
- Test pattern generation, including Pathological and moving patterns
- 32 channel audio signal generation and up to 128 channel embedding
- Video and audio monitoring
- REF locking and timing analysis

### IP Generation & Analysis (option)

- SMPTE ST 2110 and ST 2022-6/7 decapsulation / encapsulation
- Packet Interval Timing (PIT) analysis histogram for monitoring network traffic
- PIT Logging\* offers effective longer-term network monitoring
- Packet Profile Generator for stress testing video networks
- Stream & network analysis tools
- NMOS IS-04\*, IS-05\*
- Network management multicast support (IGMP v2, v3)

### HDR / WCG Generation & Analysis (option)

- Support for BT. 2100 HLG PQ and Sony S-Log3 and SR Live
- CIE chart (Rec. 709, Rec. 2020, ST 2086)
- HDR Heat-map highlights signals beyond SDR
- HDR test pattern generator

- Waveform with code value and Nits
- Vectorscope with Graticules / Targets for HDR, SDR and Wide Color Gamut
- Waveform ITU-R 2408 diffuse white markers

### Physical Layer Testing (option)

- HD/3G/6G/12G-SDI RTE™ (Real-Time Eye) option for testing SMPTE compliance issues, including under/overshoot
- Jitter analysis in five specified frequency bands

### SDI-STRESS (option)

- Advanced Generator tools with PRBS generation, control of SDI driver amplitude and jitter insertion
- PRBS Analyzer
- Pathological Detector

### System features

- Logging
- Configuration presets

### Control

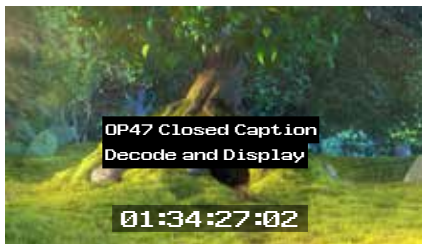
- Remote interface employing VNC technology providing up to 16 simultaneous instrument windows
- TCP/IP interface for remote control and automated testing

### Form factor

- Compact ½ 1 RU

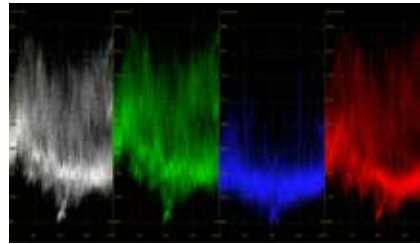
\*Upcoming software release

# Core Toolset



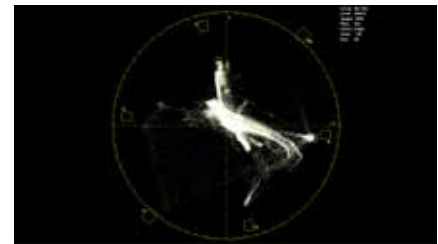
## Analyzer - Picture

- Scaling from 1/16 to Full Screen
- Cursors linked to Waveform and Data View
- Tooltip display of pixel location in the image
- ANC Timecode\*
- Closed Captions OP47, CEA-708-B\*
- 2 simultaneous Closed Caption decode windows\*
- Paint, Pop and Scroll Display Modes\*
- Italic and underlined character sets



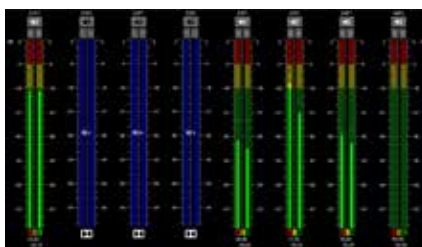
## Analyzer - Waveform

- YCbCr, YGBR and GBR parade modes
- Cursor linked to Picture and Data View
- Single line mode linked to Picture Cursor
- Configurable H and V Graticules
- User markers
- Overlay\*, Stacked\*, Parade, Single line, H & V Mag, Brightness, Persistence and Monochrome controls
- 12-bit processing



## Analyzer - Vectorscope

- 75% and 100% Targets for ITU-R Rec. 709, Rec. 2020 and HDR formats
- User targets linked to Waveform
- 0.5x to 4x Mag, center on chosen target
- Single line mode linked to Picture Cursor
- Tooltip display of Cb, Cr and Hue Angle
- IQ axis on/off
- 12-bit processing



## Analyzer - Audio Meters

- 32 channel audio metering, embedded/AES
- Metering Ballistics: PPM-I, PPM-II, Vu, Vu-Fr
- Scales: dBFS, dBu -18, dBu -20, BBC, DIN45406, NordicN9
- Adjustable peak hold times: Off, 0.1 s to Inf
- Audio pair phase meters, numerical level
- NEW** • Detection of Dolby DE, DD, DD+, DE line pos
- Stereo/mono audio preview bus



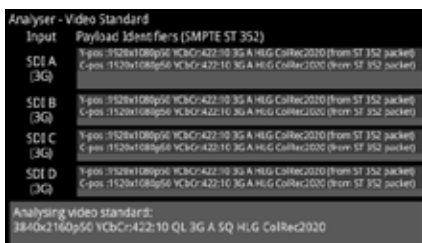
## Audio Status

- 32 channel indication of audio type and presence, PCM, Dolby DE, DD, DD+
- Decoded channel status information for up to 128 channels
- Clear indication of useful audio parameters including CRCC, PCM/data, sample frequency, word length
- Channel Status data view (Hex)



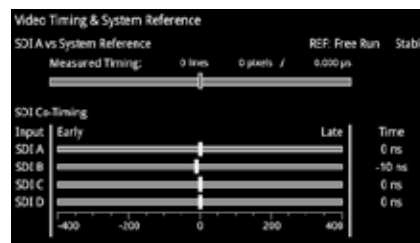
## Analyzer - Ancillary Status

- SMPTE ST 291 VANC/HANC ancillary data presence/status window
- Grid View – clear visual overview, present/absent/fault indication
- List View – ANC present list with location and status information for Checksum, Parity, DBN
- Link to ANC Inspector
- Tool tip provides ST 291 ANC type overview



## Analyzer - Video Standard

- Display of detected SMPTE S352 Payload ID for each SDI Link and Subframe
- Manual over-ride of S352 ID
- Selection of SMPTE video format
- Indication of S352 errors



## SDI Video Timing & System Reference

- Measurement of the timing of inputs against reference
- Indication of reference status and stability
- Indication of the relative co-timing of input SDI channels
- Graphical and numeric display



## Network & Automation

- Reporting of Qx Management/Control Port information and Interface Status
- Reporting of IP and MAC Address and mDNS Hostname
- Reporting of REST API and VNC Server Status and user control enable/disable
- Configuration of Static IP address/Mask, Gateway and DNS Server





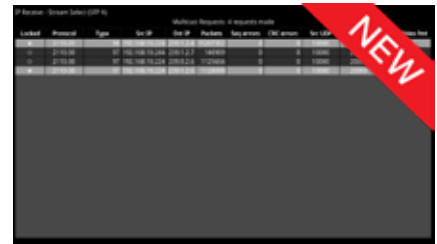
## SFP IP Network

- Reporting of presence of SFPs, SFP MAC and IP addresses (flow source IP address), and interface status
- Tx and Rx packet counters for indication of traffic activity
- User configuration of SFP IP Addresses, Masks and Gateway Addresses



## ST 2110 PTP Info

- Control of PTP domain and communication mode (multicast, hybrid w/o negotiation)
- Indication of lock status
- Grandmaster information including master ID and time source
- Indication of estimated of frequency and phase lock offsets
- Indication of one step or two step traffic



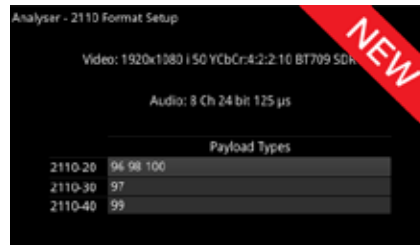
## IP Receive Multi Flows

- Reporting of the IP Flows available to the receiver and user selection of the required flows
- Indication of Qx locked status, Protocol, Src and Dst IP and Port Numbers, SSRC, Packet Counts, Sequence, payload and CRC errors
- Configuration of Multicast Destination IP addresses and subsequent Multicast Join requests



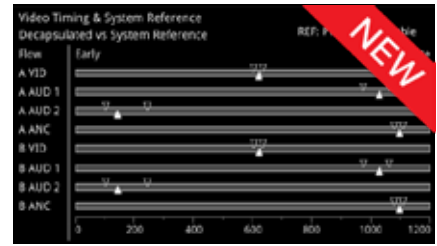
## ST 2022-7 Status

- Indication of the health of ST 2022-7 seamless protection
- Warning of ST 2022-7 flow-pair mis-match
- Warnings of errors on flows and errors on reconstructed output and error rates/second
- Relative measure of Path Differential of flows on SFPB (Blue Network) relative to SFPB (Amber Network)
- Class A, B, C, D markers



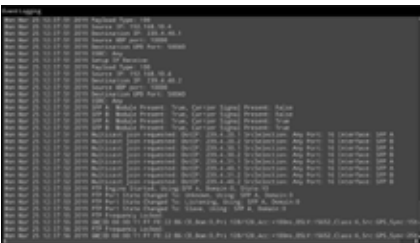
## ST 2110 Format Setup

- User-configurable allocation of ST 2110 packet IDs
- User-configurable video format parameters for ST 2110-20 flows
- User-configurable audio format parameters for ST 2110-30 flows includes packet time and channel count
- Automatic detection of audio format, channel count and packet time



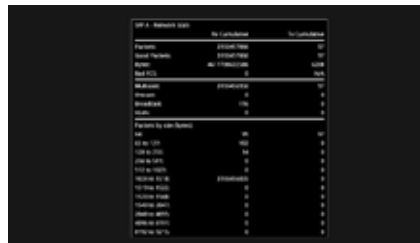
## IP Flow Timing and System Reference

- Measurement of the timing relationship of selected flows against PTP
- Indication of PTP lock status and stability
- Indication of the relative co-timing of the selected flows



## IP Event Logging

- Event logs of: PTP, IP Interfaces, Rx Traffic, Tx Traffic, SFP records



## SFP Network Statistics

- Reporting of SFP cumulative receive traffic
- Indication of packet types : multicast, unicast, broadcast, VLAN
- Indication of packet sizes and cumulative number of packets for each size



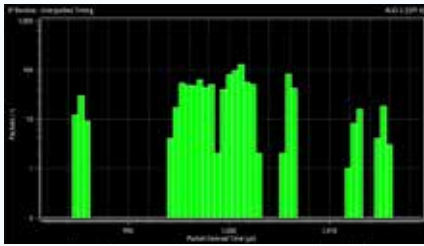
## SFP Information

- SFP Status information for monitoring the physical network connection
- Indication of SFP Vendor part and laser characteristics
- Rx and Tx power for debug of fibre connectivity
- Optical link length indicator

# Optional Toolsets

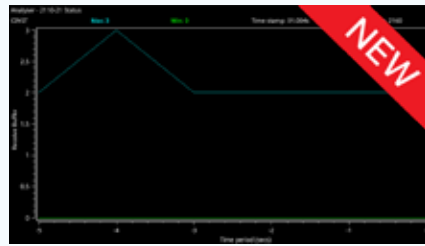


## Network Traffic Analysis [PHQXO-IP-NAT]



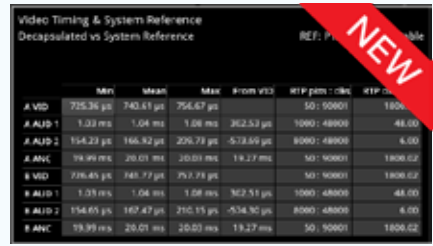
### Inter-packet Timing

- Stream health reporting using histogram to visualise the distribution of inter-packet arrival times
- Packet counts (log or linear scales) mapped against arrival times (us)
- Easy diagnosis of congestion with max, mean and min inter-packet arrival times



### IP Receive Statistics

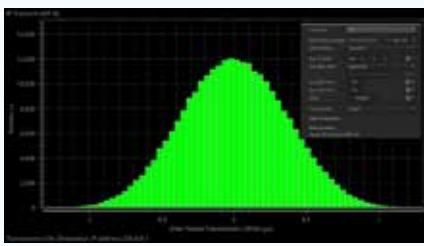
- Reporting of receiver flow video statistics and stability
- ST 2022-6 measurement of total and active samples per line and lines per frame and indication of ST 352 Payload ID
- ST 2110-21 measurement of Network Compatibility Model (Cinst) and Virtual Receiver Buffer Model (VRX)



### Adv. PTP Media Timing

- Data showing the relationship of the transmitter encapsulation and media to PTP
- Measured number of RTP packets and RTP clock rate per second
- Measured RTP clocks per packet per second
- Flow to PTP min and max timing measurements

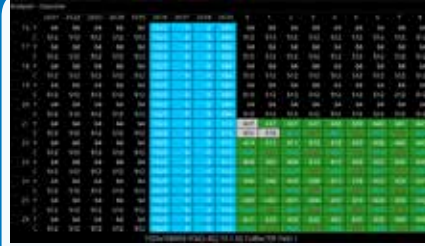
## Network Traffic Generation [PHQXO-IP-NGT] (Requires PHQXO-GEN)



### IP Transmit (ST 2022-6)

- Configuration of Transmission flow addresses, port numbers and SSRC
- Injection of Inter-packet jitter onto outgoing flow
- Gaussian or uniform distribution
- Flow control on/off

## Data [PHQXO-DATA]



### Analyzer - Data View

- Allows analysis of complex faults particularly in an R&D environment
- Detailed view of data words in the SDI stream with tooltip hint
- Navigate function for rapid access to a required line, pixel or TRS word
- Color coding to help identification
- Cursor linked to Picture and Waveform



### ANC Inspector

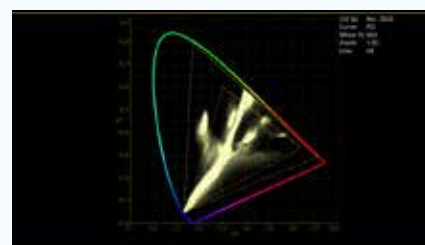
- Ancillary data packet analyzer
- Link from ANC Status window
- User-defined DID/SDID windowed search
- Trigger on error, single shot, continuous
- ANC packet capture with Hex view
- ANC packet decode view

## HDR Toolset [PHQXO-HDR]



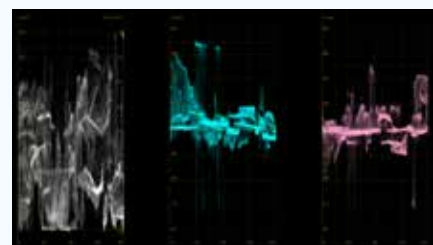
### False Color Highlighting

- Programmable 'Heat Map' to highlight luminance zones providing quick identification of shadows, skin or mid-tones or specular highlights
- 7 simultaneous programmable color overlay bands
- Presets for HDR and SDR ranges plus user custom



### Analyzer - CIE Chart

- CIE 1931 x,y display
- Single line mode linked to picture cursor
- Pan and zoom
- ITU-R BT. 709, BT. 2020 and ST 2086 gamut overlays
- Tooltip co-ordinate display
- Support for BT. 1886, BT. 2100 HLG and PQ, Sony S-Log3, SR Live



### HDR Waveform and Gen.

- Waveform HDR gratitudes with Nits (Cd/m<sup>2</sup>)
- BT. 2408 diffuse white markers
- SDR patterns mapped to HDR Rec. BT. 2020 containers – useful for like for like set-up of HDR and SDR monitors and line checks
- Full Rec. 2020 patterns
- Support for BT. 1886, BT. 2100 HLG and PQ, Sony S-Log3, SR Live

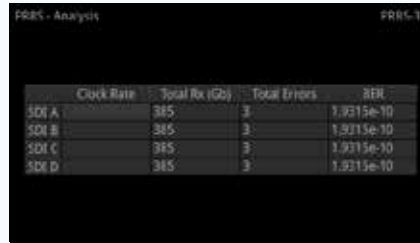


## SDI-STRESS Toolset [PHQXO-STRESS]



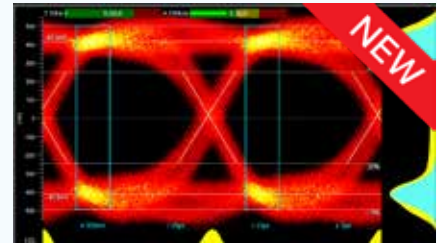
### Adv. Generator Tools

- Generation of PRBS-7, 9, 15, 23, 31
- SDI scrambler and sync bit Insertion on/off
- Control of SDI driver amplitude +/-10%
- Control of jitter insertion frequency, amplitude and type
- Control of pre-emphasis, rise/fall time



### PRBS Analyzer

- Indication of PRBS cumulative received data and PRBS type
- Reported cumulative errors
- Calculated Bit Error Rate (BER)



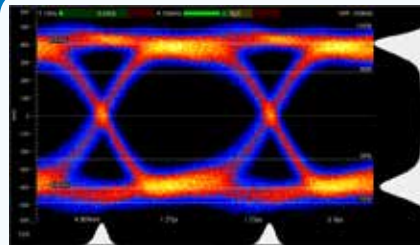
### Advanced Eye Analysis

- Choice of Shorth Mean or Mode amplitude measurements
- User-definable time measurement window for amplitude measurement



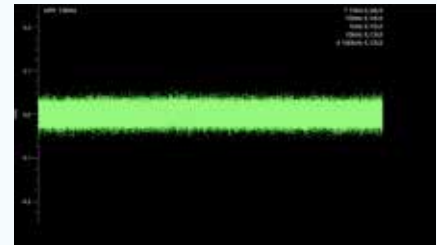
### Pathological Detector

- Generator status indication of rate at which the video pattern generator is creating SDI pathological conditions
- Indication of PLL and EQ pathological rates/second
- Detection on each active SDI link
- Realtime GPI outputs of pathological detect for external equipment triggering



### SDI EYE Analysis

- Real-Time Eye (RTE) for testing SMPTE compliance
- DC coupled and automatic measurements of: amplitude, rise and fall time, jitter and under/overshoot, visual rise time indication
- Amplitude and time histograms
- Single or multiple eyes with choice of color and heat-map overlay and infinite persistence



### SDI Jitter Analysis

- Realtime SMPTE jitter measurements down to 10Hz
- 10Hz, 100Hz, 1kHz, 10kHz, 100kHz filters
- H, 2H, F, V Trigger
- Infinite persistence modes
- +/- 0.25 to +/- 8 UI vertical scale adjustment

## Generator Toolset [PHQXO-GEN]



### Video Generation

- 12G/6G/3G/1.5G 4K/UHD and 2K/HD SDI signal generation
- Support for Single, Dual and Quad links with single, square and 2SI sub-images, Level A and B
- Moving test patterns
- 422, 444, 4224 and 4444, YCbCr and RGB Formats
- Import and display of TIFF images



### Audio Generation

- 32 channel audio generation, 128 channel embedder
- Choice of fixed tones or chromatic scale – to help with channel identification
- Choice of fixed or ramp levels – to help with channel identification
- Custom config of number of active audio groups and channels
- Master gain control



### Pathological Generation

- SDI pathological stress patterns, Eq, PLL and CheckField
- User-definable combination of SDI stress and conventional patterns up to full frame

# Specifications



## Qx IP

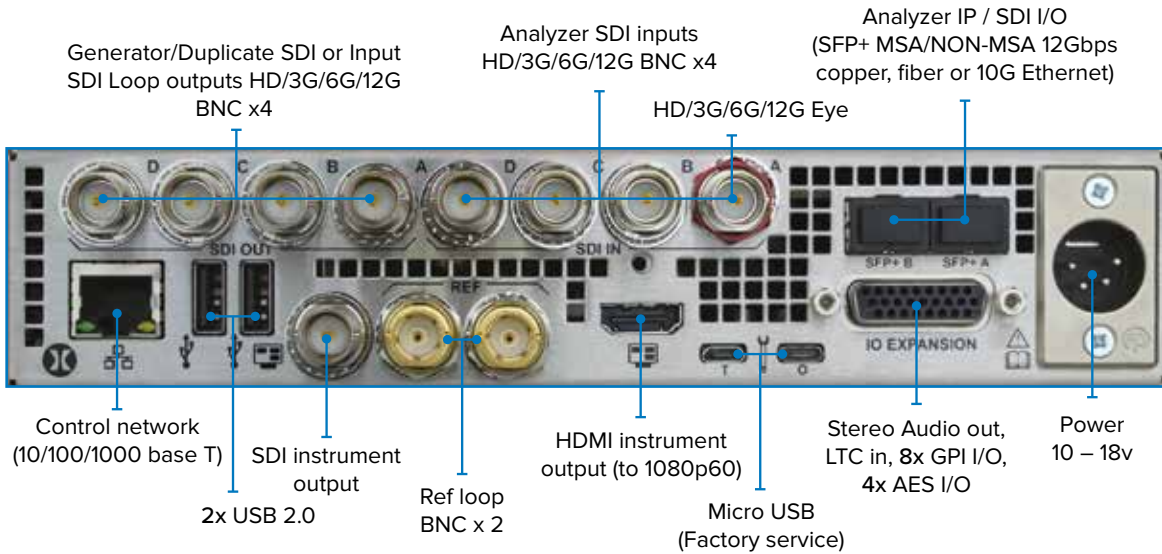
## Qx 12G

Formats supported (generation, analysis & monitoring)		
IP SMPTE 2110/2022-7	●	○
IP SMPTE 2022-6	●	○
3G/HD-SDI	●	●
12G/6G-SDI	○	●
Video inputs / outputs		
4 x SDI inputs, HD/3G, 75 Ohm terminated BNC	●	N/A
4 x SDI inputs, HD/3G/6G/12G, 75 Ohm terminated BNC	○	●
4 x SDI outputs, HD/3G, 75 Ohm BNC	●	N/A
4 x SDI outputs, HD/3G/6G/12G, 75 Ohm BNC	○	●
RTE Real-Time Eye input (12G/6G/3G/HD-SDI) x 1 (SDI input A) BNC	○	○
SFP+ MSA/NON-MSA 12 Gbps copper or fiber SDI, 10 G Ethernet	○	○
Audio inputs / outputs		
4 x 75 Ohm AES selectable I/O (26 pin high density 'D' Type socket)	●	●
1 x Stereo analog audio output (26 pin high density 'D' Type socket)	●	●
8 channel 48kHz PCM audio on HDMI and SDI Instrument output	●	●
User interface		
HDMI 1.4 instrument output, 1920 x 1080, 4:4:4 RGB, Type A	●	●
Reference		
2 x 75 Ohm BNC high impedance looping reference input, tri-level or B&B with cross lock	●	●
Networking & control		
10/100/1000 BASE-T	●	●
8 x bi-directional GPI (26 pin high density 'D' Type socket)	●	●
Monitoring		
Internal Beeper	●	●
Form factor		
Size (Width x Height x Depth - excluding projections)	253 x 44 x 211 mm	253 x 44 x 211 mm
Weight	1.9 kg	1.9 kg
Electrical		
Power consumption	50W typical, 70W max	50W typical, 70W max
4 Pin XLR power connector	12V nominal (10V-18V)	12V nominal (10V-18V)
AC Power adapter	90-264VAC, 120W	90-264VAC, 120W
Warranty		
Warranty (1 year)	●	●
Extended Warranty Package (3 - 5 years)	○	○

● Standard  
○ Optional

\*Upcoming software release

# Rear panel



## Ordering

### Qx IP

PHQX01-IP	Qx IP hybrid IP/SDI analyzer for ST 2110, 2022-6 and 3G/HD-SDI (1RU, ½ rack)
PHQX01E-IP	Qx IP hybrid IP/SDI analyzer for ST 2110, 2022-6 and 3G/HD-SDI with Eye / Jitter toolset (1RU, ½ rack)

10G Ethernet SPFs must be ordered separately for Encap and Decap, see PHSFP-10GE-SR

#### Options

PHQXO-IP-NAT	IP network traffic analysis toolset
PHQXO-IP-NGT	IP network traffic generation toolset (Packet Profile Generator) – requires Video signal generator (PHQXO-GEN)
PHQXO-DATA	Data View Analyzer and ANC Inspector
PHSFP-10GE-SR	10G Ethernet SFP+, short range up to 300m (Qx IP supports 2 x SFP+)
PHQXO-HDR	HDR/WCG toolset with CIE 1931 chart, HDR Heat-map
PHQXO-GEN	Video signal generator for IP and SDI
PHQXO-UHD	UHD (12G/6G-SDI) support
PHQXM-01E	Eye / Jitter toolset upgrade for PHQX01-IP (return to factory upgrade)
PHQXO-SDI-STRESS	Advanced SDI-STRESS Toolset [requires PHQXO-GEN, PHQXO-UHD and PHQXM-01E]
PHQXK1	19" rack mount kit for 1x Qx IP
PHQXK2	19" rack mount kit for 2x Qx IP
PHQXK3	9.5" rack mount kit for 1x Qx IP
PHQXK4	10.5" rack mount kit for 1x Qx IP

#### Extended Warranty

PHQX-3YEAR	3 Year Warranty for Qx IP*
PHQX-5YEAR	5 Year Warranty for Qx IP*

### Qx 12G

PHQX01	Qx 12G UHD/HD-SDI analyzer / generator (1RU, ½ rack)
PHQX01E	Qx 12G UHD/HD-SDI analyzer / generator with Eye / Jitter toolset (1RU, ½ rack)

#### Options

PHQXO-IP-DEC	IP license for ST 2110/2022-6 Decap+
PHQXO-IP-ENC	IP license for ST 2022-6 Encap+
PHQXO-IP-NAT	IP network traffic analysis toolset
PHQXO-IP-NGT	IP network traffic generation toolset (Packet Profile Generator)
PHQXO-DATA	Data View Analyzer and ANC Inspector
PHSFP-10GE-SR	10G Ethernet SFP+, short range up to 300m (Qx 12G supports 2 x SFP+)
PHQXO-HDR	HDR/WCG toolset with CIE 1931 chart, HDR Heat-map
PHQXM-01E	Eye / Jitter toolset upgrade for PHQX01 (return to factory upgrade)
PHQXO-SDI-STRESS	Advanced SDI-STRESS Toolset [requires PHQXM-01E]
PHQXC-1	12G-SDI Test Cable, 1m
PHQXK1	19" rack mount kit for 1x Qx 12G
PHQXK2	19" rack mount kit for 2x Qx 12G
PHQXK3	9.5" rack mount kit for 1x Qx 12G
PHQXK4	10.5" rack mount kit for 1x Qx 12G

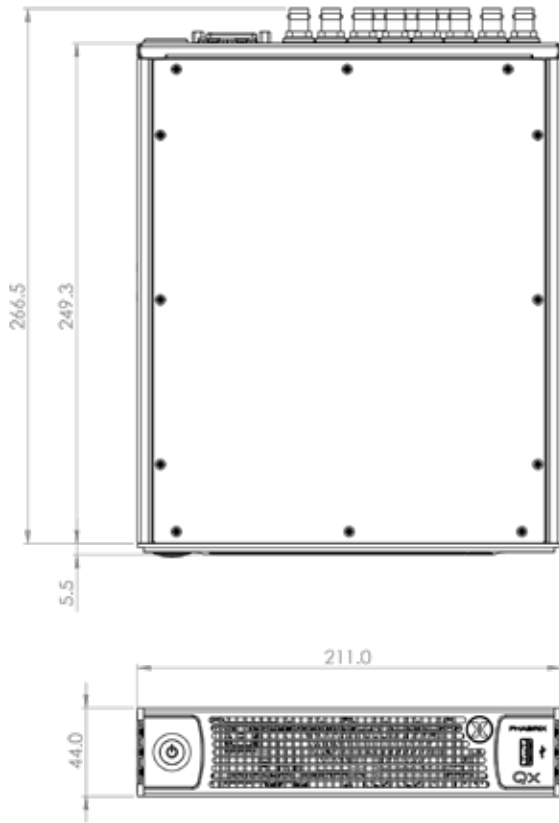
#### Extended Warranty

PHQX-3YEAR	3 Year Warranty for Qx 12G*
PHQX-5YEAR	5 Year Warranty for Qx 12G*

\* One year warranty included as standard  
+ Requires 10G Ethernet SFP+ module (PHSFP-10GE-SR)



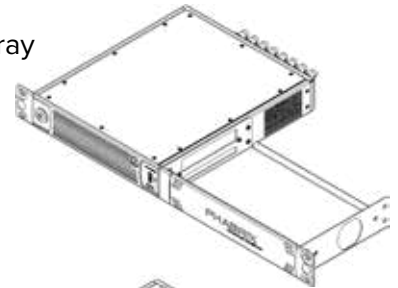
# Dimensions & Installation



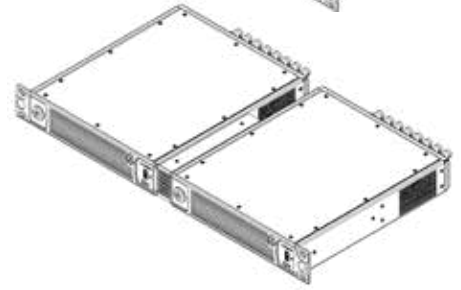
Desktop



Single Rack mount tray with cover  
PHQXK1



Dual Rack mount  
PHQXK2





PHABRIX®

For more information about IP,  
4K/UHD and HDR contact:

[www.phabrix.com](http://www.phabrix.com)

