PHABRIX®
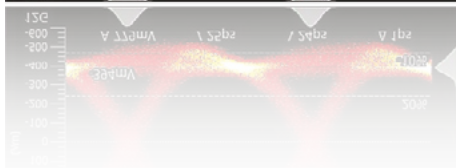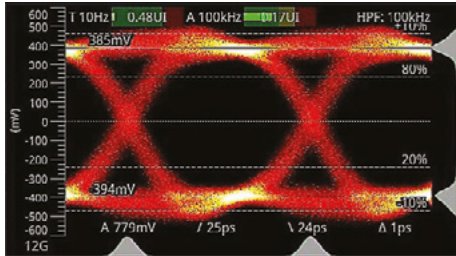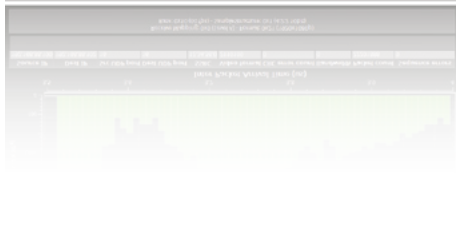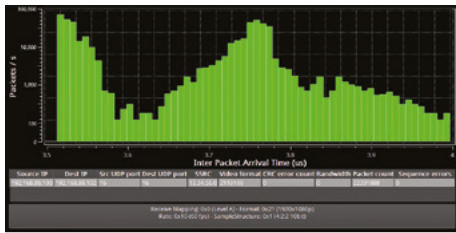
Qx IP | Qx 12G

IP, 4K/UHD + HDR generation, analysis & monitoring

Qx IP | Qx 12G

IP, 4K/UHD + HDR generation, analysis & monitoring

The Qx range brings together all the essential tools for product development, infrastructure compliance testing and 4K/UHD content monitoring using the next generation of IP and SDI video formats.
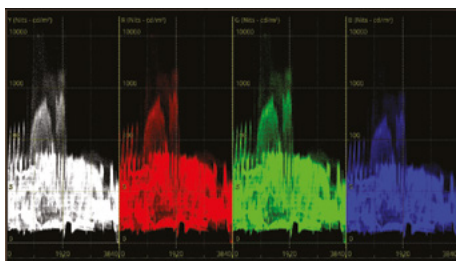
Single device for IP, 4K/UHD & HDR

With the Qx range, you no longer need multiple test & measurement devices for IP, SDI and HDR / WCG.

A single Qx can perform signal generation, analysis and monitoring across SMPTE 2022-6 IP and HD, 3G, 6G and 12G-SDI formats.

TR03, AES67 and PTP (ST 2059-2), as defined in the draft SMPTE 2110 specification, will be supported with upcoming software releases.

Fast, automated 12G physical layer analysis

Qx offers the fastest 12G-SDI physical layer testing, with its RTE™ (Real-time Eye) technology instantly highlighting any SMPTE compliance issues, including eye under/overshoot.

Advanced 12G/6G-SDI physical layer tools include Jitter waveform, Jitter Insertion, Jitter FFT analysis, and pathological test patterns.

Built-in automation control allows testing to be performed faster, more reliably and at lower cost.

Ideal for live production

Highly compact and ultra-quiet, Qx weighs less than 2Kg and uses just 50W. This makes it ideal for live production applications.

A flexible, easy to use control interface provides unlimited instrument layering, and is ideal for fast moving operation.

For challenging environments, Qx can be fitted with a replaceable air filter.

The Qx range can be quickly configured for IP, 4K/UHD or HDR / WCG generation and analysis

Qx IP

IP, 3G-SDI + HDR generation, analysis & monitoring

The entry-level Qx IP provides all the essential tools for hybrid SMPTE 2022-6 IP and 3G-SDI environments, including generation, analysis and video/audio monitoring.

Key Features

SMPTE 2022-6 IP generation & analysis
- SPMTE ST 2022-6 encapsulation/de-encapsulation
- PIT (Packet interval timing) histogram for monitoring network traffic
- Packet transmission interval timing generator
- Network management multicast support (IGMP2,3)

3G-SDI generation & analysis
- Simultaneous generation and analysis
- Waveform monitor for YRGB/YUV monitoring
- Vectorscope for checking colour bias / conformity
- Test pattern generation, including Pathological
- Video and audio monitoring
- REF locking and timing analysis

HDR / WCG generation & analysis
- Dolby PQ HDR supported (HLG and SLOG3 standards with future upgrade)
- CIE chart (Rec. 709 and Rec. 2020)
- HDR Heat-map highlights signals beyond SDR
- HDR test pattern generator
- Waveform (log scale to 10,000 NIT) with Wide Colour Gamut support

Field Upgrades
- 12G/6G SDI standards
- SMPTE ST 2059-2 (PTP)
- TR03, AES67, SMPTE ST 2110
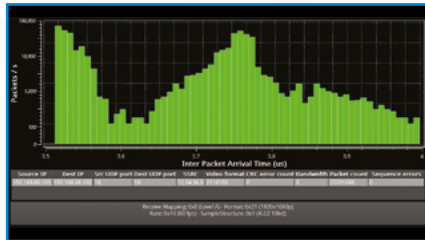
System Features
- Logging
- Configuration presets

Control
- TCP/IP based control
- Automation port for remote control and automated testing

Form factor
- Compact ½ RU
- Air filter option for live production

Qx 12G

IP, 4K/UHD (12G-SDI) + HDR generation, analysis & monitoring

REAL-TIME EYE

The top of the range Qx 12G is designed for multi-rate 4K/UHD, including Physical Layer testing of 12G, 6G, 3G and HD formats. It can also provide all of the SMPTE-2022-6 IP and HDR/WCG generation and analysis capabilities of the Qx IP.

Key Features

4K/UHD (12G/6G/3G/HD-SDI) generation & analysis
- Simultaneous generation and analysis
- Waveform monitoring for YRGB/YUV monitoring
- Vectorscope for checking colour bias / conformity
- Test patterns, including 12G Pathological
- Video and audio monitoring
- REF locking and timing analysis

SMPTE 2022-6 IP generation & analysis
- SPMTE ST 2022-6 encapsulation/de-encapsulation
- PIT (Packet interval timing) histogram for monitoring network traffic
- Packet transmission interval timing generator
- Network management multicast support (IGMP2,3)

Field Upgrades
- SMPTE ST 2059-2 (PTP)
- TR03, AES67, SMPTE ST 2110

Physical layer testing
- 12G Real-time Eye (RTE) for testing SMPTE compliance issues, including under/overshoot
- Jitter insertion
- Jitter FFT

HDR / WCG generation & analysis
- Dolby PQ HDR supported (HLG and SLOG3 standards with future upgrade)
- CIE chart (Rec. 709 and Rec. 2020)
- HDR Heat-map highlights signals beyond SDR
- HDR test pattern generator
- Waveform (log scale to 10,000 NIT) with Wide Colour Gamut support

System Features
- Logging
- Configuration presets

Control
- TCP/IP based control
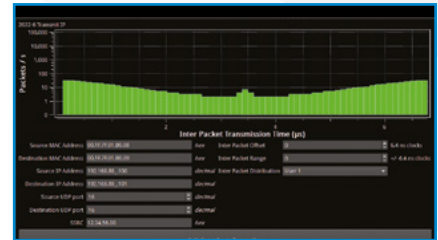- Automation port for remote control and automated testing

Form factor
- Compact ½ RU
- Air filter option for live production

SMPTE 2022-6 IP tools

Inter packet arrival time analysis

- Packet interval timing histogram for monitoring network congestion
- Packet counts mapped against arrival time (μS)
- Packet transmission interval timing to test impact of infrastructure on IP stream

IP network analysis

- Transmission and receive traffic analysis
- Monitoring packet types and sizes

Packet transmission

- Instrument provides 2022-6 IP signal generation
- Create different packet interval timing distribution profiles to simulate IP network congestion conditions

SFP status monitoring

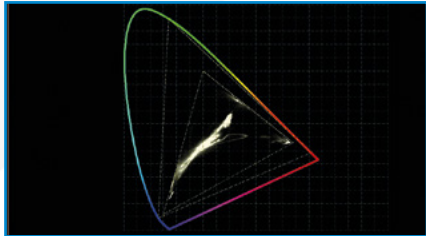- SFP status for monitoring physical network connection

TR-03
AES67
PTP

Emerging IP standards

- PHABRIX is engaged in the development of IP with AIMS
- Emerging standards will be supported with upcoming software releases, including TR03, AES67 and PTP (ST.2059-2) , as defined in the draft SMPTE 2110 specification
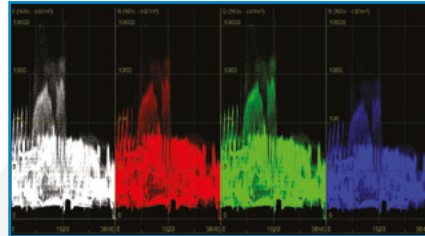
HDR (Dolby PQ) / WCG tools

CIE chart

- CIE 1931 X Y chromacity plot
- Rec. 709 and Rec. 2020 support
- Overlay shows Gamut boundaries

Waveform monitor

- Wide Colour Gamut support for Rec. 2020
- PQ scale to 10,000 NITs
- Pan and zoom
- YCbCr, YRGB, RGB

Vectorscope

- Coefficients adjusted for analysis of HDR
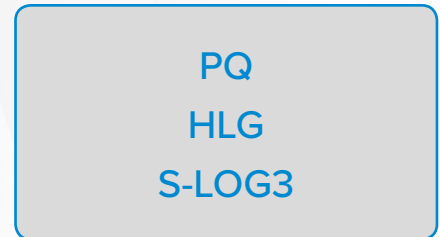- 75% or 100% graticules
- Zooming

HDR Heat-map

- Highlighting 'heat map' above SDR 709, where HDR is impacting brightness
- NIT level scale, with upper/lower thresholds
- Cursors

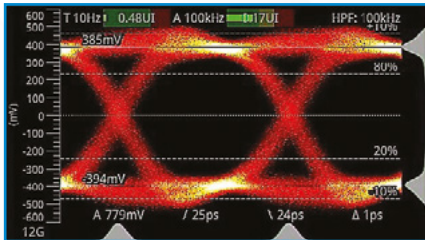## Generator

- HDR test pattern generator

PQ, HLG and SLOG3

- HDR tools support Dolby PQ standard
- HLG and SLOG3 HDR tools will be available with future software releases
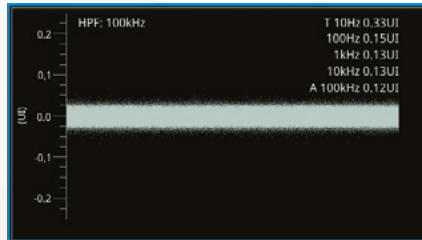
PQ
HLG
S-LOG3

12G/6G/3G/HD-SDI

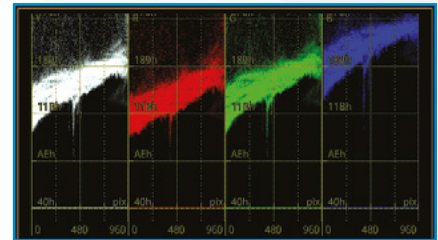## Physical layer and signal analysis tools

Real-time Eye

- Instant, Real-time Eye (RTE) for testing SMPTE compliance issues, including under / overshoot
- Rise time and fall time
- Amplitude histograms
- Single or multiple eyes

Jitter waveform

- Real-time jitter measurements
- 10, 100, 1k, 10k, 100k filters

Waveform

- Up to 4 waveform traces at full 12-bit resolution
- Configurable H and V graticules
- Single line, H-mag, V-mag, brightness, colour and monochrome controls

Vectorscope

- 12-bit processing
- Magnification (0.5x to 4x)
- 75% and 100% targets
- 5% +/-5 degress boxes
- IQ axis on/off, perimeter rose, brightness, gamma, raw, persistence, low pass and interpolate trace modes
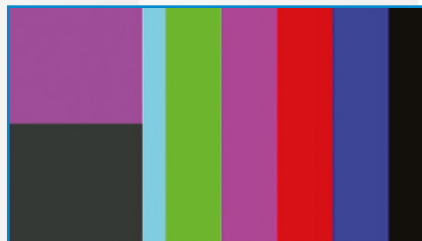
Signal generation

- 12G/6G/3G signal generation, including pathological test patterns for stress testing
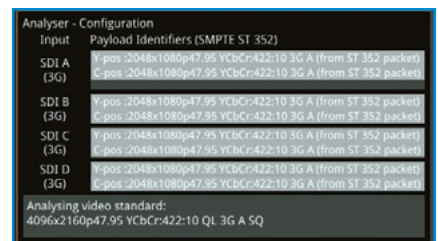
Input standards selection

- Easy SMPTE standards selection
- Payload indicators simplify the use of 4K/UHD with more than one carrier signal (4 x 3G or 2 x 6G)

Picture display

- Scaling from 1/16 to full screen
- Colour borders to simplify identification
- Cursors linked to waveform and data view

Pixel pan and zoom

- Picture magnification, zooming and pixel panning
- Ideal for checking 4K/UHD quadrant intersections
- Grid display offers 1x, 2x, 4x, 8x and 16x pixel sizes
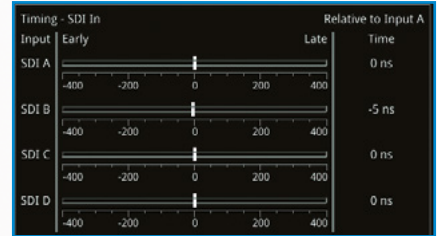

Picture Quad 3G alignment

- Relative timing tools for 4K/UHD based on 4 x 3G signals
- Graphic and numeric values

Audio monitoring

- 32 channel audio monitoring
- Input selection of audio groups, and sub-image audio for 12G
- Metering Ballistics options include PPM Type I, PPM Type II, Vu and VuFr
- Audio pair phase meters
- Stereo pair & mono monitoring

ANC detect and ancillary status

- Colour coded signal conditions for present, lost, and error
- Toolset to edit DID and SDID values

SDI data view

- Presents the raw data in the signal as hex, decimal or binary
- Pixel value shown by frame and line value
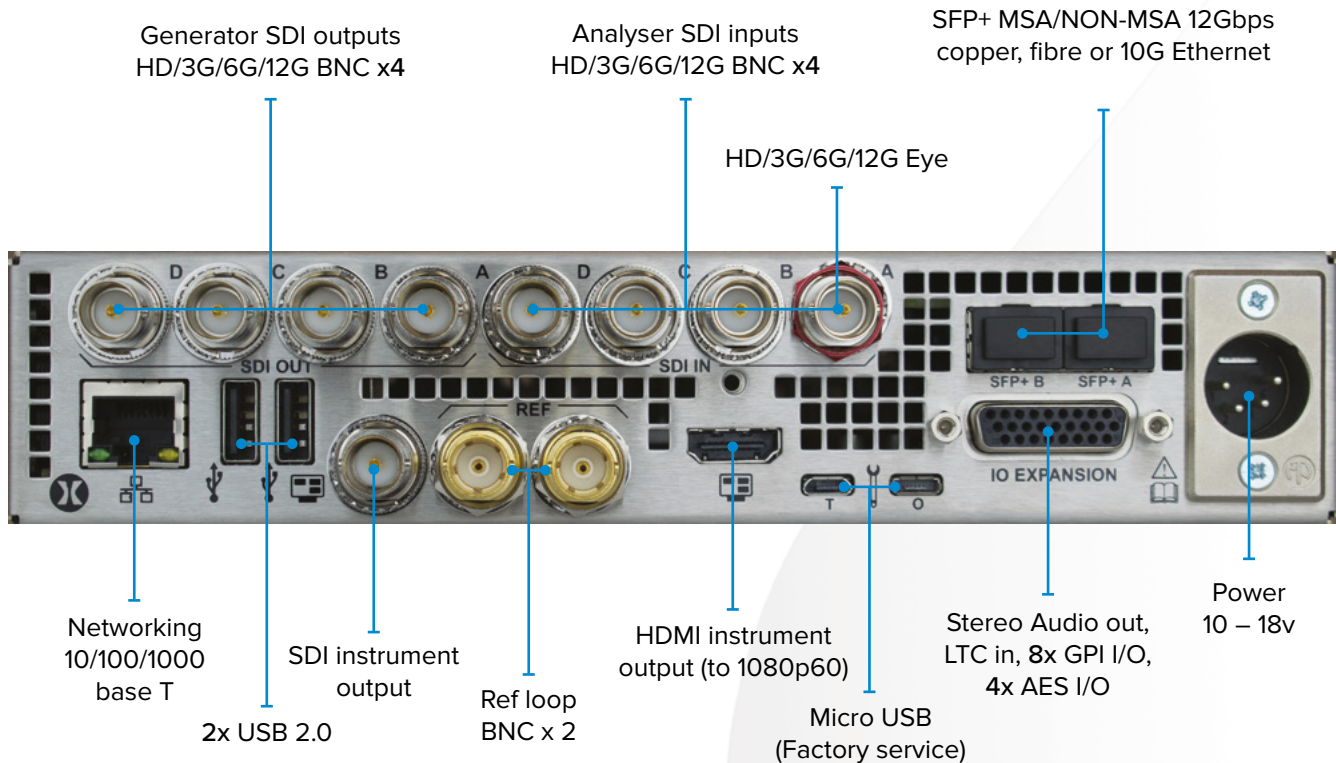- Presents entire frame with active video, TRS words & blanking data

Specifications

	Qx IP	Qx I2G
Formats supported (generation, analysis & monitoring)		
IP SMPTE 2022-6	●	○
3G/HD-SDI	●	●
12G/6G-SDI	○	●
Video inputs / outputs		
4 x SDI for HD, 3G, 6G, 12G 75 Ohm terminated BNC Inputs	●	●
4 x SDI for HD, 3G, 6G, 12G 75 Ohm terminated BNC Outputs	○	●
RTE Real-time Eye input (12/6G/3G/HD/SDI Gbps) x 1 (SDI input A) BNC		○
SFP+ MSA/NON-MSA 12 Gbps copper or fibre 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 analogue 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 loudspeaker Beeper	●	●
Form factor		
253 x 44 x 211 mm (width x height x depth) excluding projections	●	●
1.9 kg weight	●	●
Electrical		
Power consumption 50W typical, 70W max	●	●
4 Pin XLR power connector, 12V nominal (10V-18V)	●	●
AC Power adapter (included), 90-264VAC, 120W	●	●
Warranty		
Warranty (1 year standard increased to 3 - 5 years with Extended Warranty package)	●	●

● Standard
○ Optional

Rear panel

Generator SDI outputs
HD/3G/6G/12G BNC **x4**

Analyser SDI inputs
HD/3G/6G/12G BNC x4

SFP+ MSA/NON-MSA 12Gbps
copper, fibre or 10G Ethernet

HD/3G/6G/12G Eye

Networking
10/100/1000
base T

2x USB 2.0

SDI instrument
output

Ref loop
BNC x 2

HDMI instrument
output (to 1080p60)

Micro USB
(Factory service)

Stereo Audio out,
LTC in, **8x** GPI I/O,
4x AES I/O

Power
10 – 18v

Ordering

Qx IP

PHQX01-IP	Qx 1U ½ rack 3G IP/SDI analyser (SMPTE 2022-6)

Options

PHQXO-IP-NET	IP network traffic analysis tools
PHSFP-10GE-SR	10GBASE-SR Ethernet short range SFP+
PHSFP-10GE-LR	10GBASE-LR Ethernet long range SFP+
PHQXO-GEN	Audio video signal generator
PHQXO-UHD	UHD 12G/6G-SDI standards
PHQXO-HDR	HDR/WCG standards
PHQX-3YEAR	3 Year Warranty
PHQX-5YEAR	5 Year Warranty

Qx 12G

PHQX01	Qx 1U ½ rack 12G-SDI UHD analyser/generator
PHQX01E	Qx 1U ½ rack analyser/generator + 12G eye/jitter

Options

PHQXO-IP-LIC	IP Encap/De-encap license (SMPTE 2022-6)
PHQXO-IP-NET	IP network traffic analysis tools
PHSFP-10GE-SR	10GBASE-SR Ethernet short range SFP+
PHSFP-10GE-LR	10GBASE-LR Ethernet long range SFP+
PHQXO-HDR	HDR/WCG standards
PHQX-3YEAR	3 Year Warranty
PHQX-5YEAR	5 Year Warranty

PHABRIX®

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

www.phabrix.com