

BA-1600

1.6T BIT ANALYZER

- World-class, high-performance electrical BER tester for 1.6T design validation, including thermal testing.



KEY FEATURES

Full lifecycle validation for 1.6T, 800G and 400G across lab, fab and live environments

Superior hardware design: native electrical interface, excellent signal quality, clean eye diagram and low error floor

High-performance signal integrity and BER testing for validating compliance and performance in next-gen 1.6T designs

Flexible, cost-effective: choose 8-channel unit for transceiver testing, or 4-channel unit for high-speed component testing

User-friendly GUI streamlines workflows, and reduces learning curves

PAM4 support for validating high-speed signaling performance

FEC generation and analysis testing to ensure data integrity over ultra-fast connections

Real-time FEC analysis: testing of pre/post FEC BER, symbol error distribution and FEC margin

BLER: Block error ratio statistics and an efficient FLR estimation mechanism, addressing the time constraints of ultra-low BER measurements

Powerful equalizer and channel simulator: powerful equalizer includes CTLE

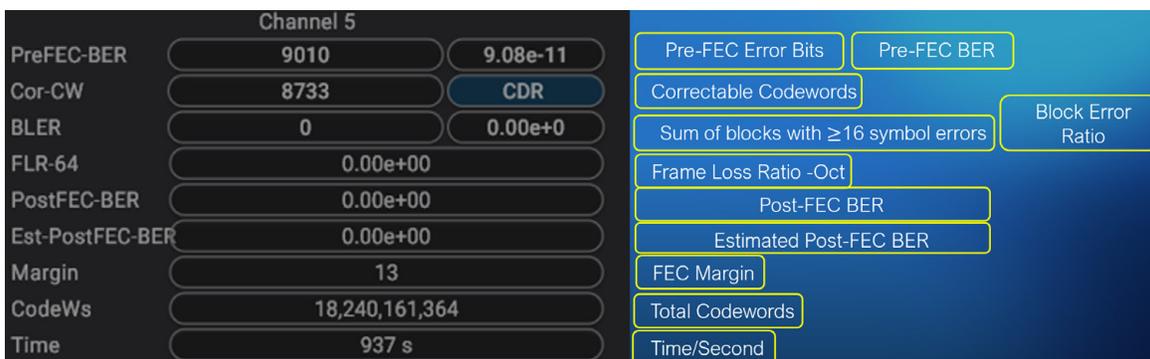
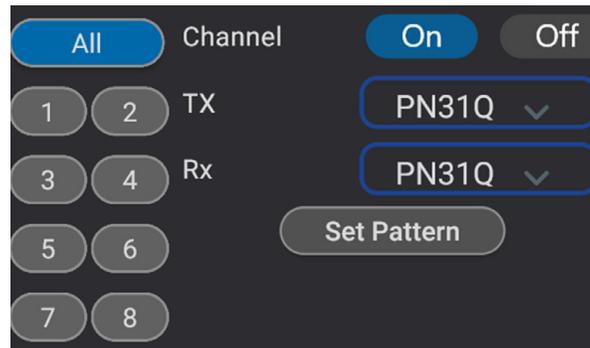
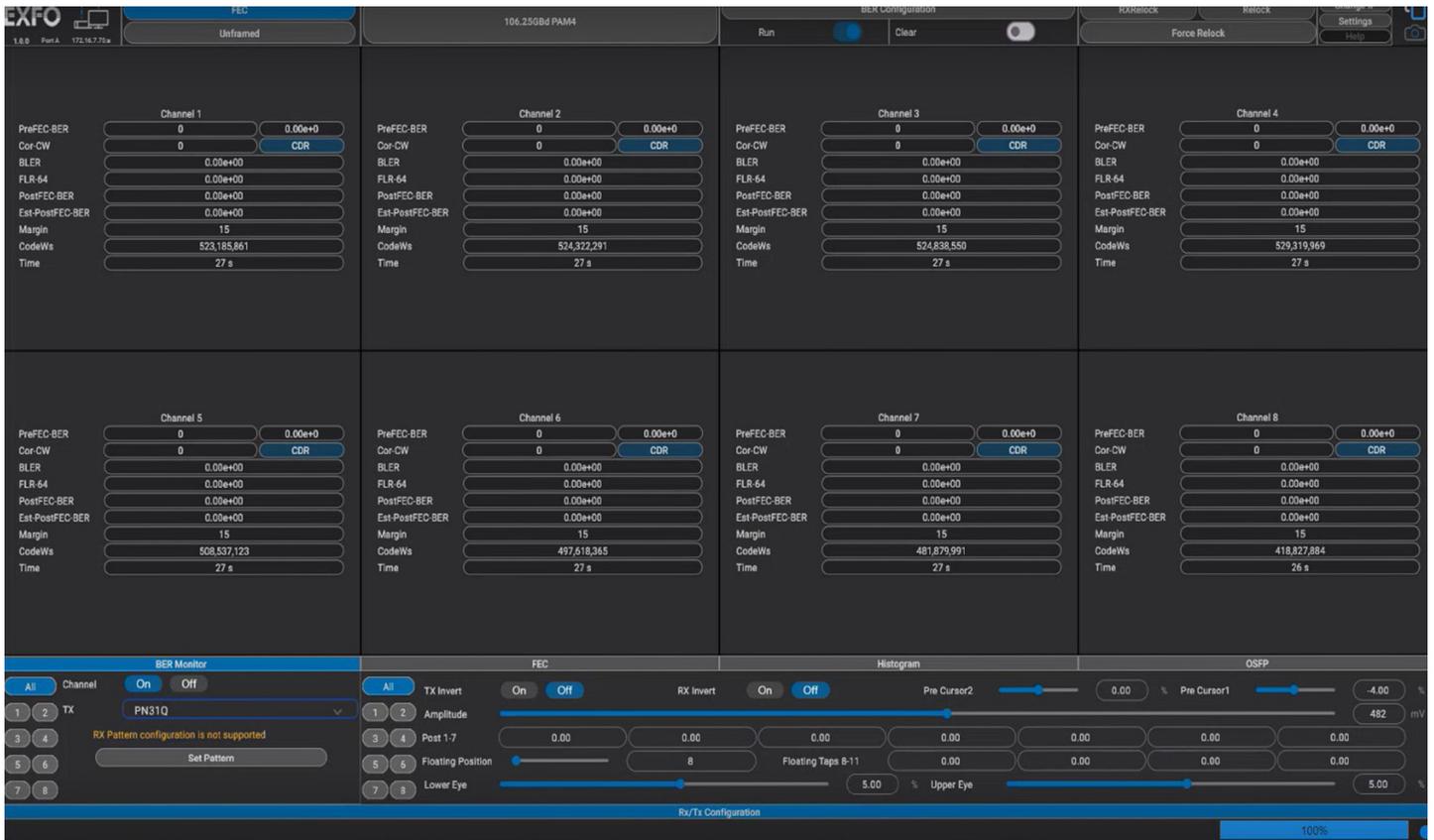
I²C register read/write access enables the direct control and monitoring of device parameters for fast, low-level diagnostics and efficient debugging

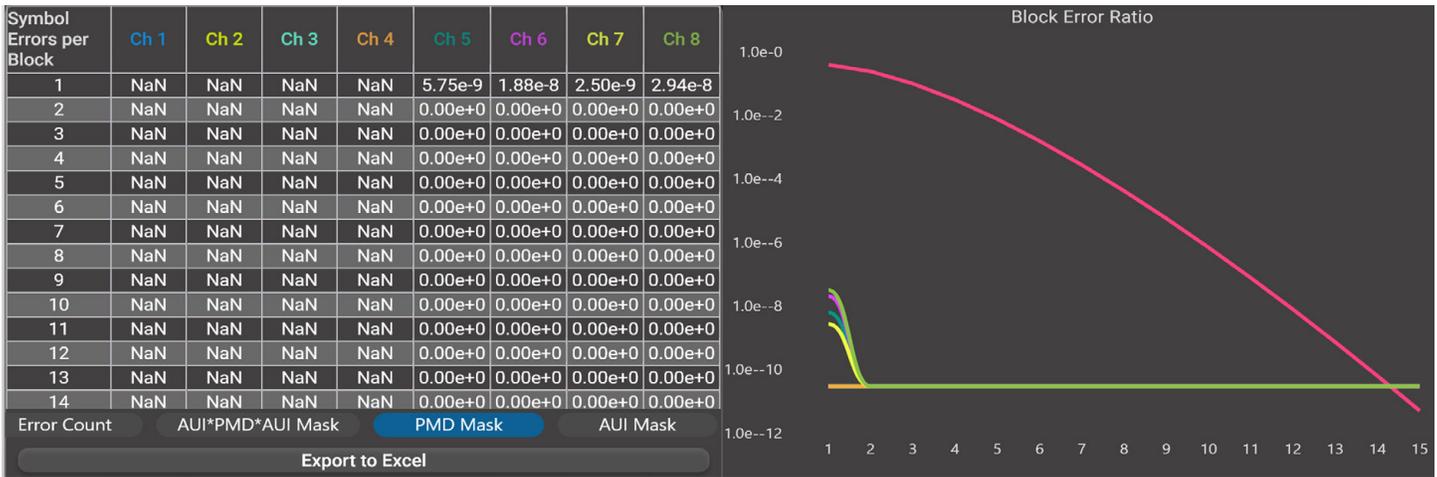
“Save-and-load” functionality for all applicable parameters reduces valuable time and ensures test consistency

Automation simplifies complex test configurations and speeds up validation using a complete API suite

POWERFUL AND SIMPLIFIED USER INTERFACE

The BA-1600 graphical user interface (GUI) provides simplified and real-time test results per channel. It requires an external Windows-based PC with Ethernet capability to run the GUI and API.





FEC channel distribution and BLER mask testing

Board Type: OSFP QSFPDD

Power Supply: V

HW Signals: LPWn RSTn PRSn Int High(3.3v) Low(ground)

I2C register: Address Value R W

MCB control

Clock Ratio: Rate/2 Rate/4 Rate/8 Rate/16 Rate/32

Enable output Clock: Channel 5 Channel 6 Channel 7 Channel 8

Clock output Channel: Channel 1 Channel 2 Channel 3 Channel 4 Channel 5 Channel 6 Channel 7 Channel 8 CDR: BER: Errors: Sync: # Bits: # Bits: # Bits: # Bits: Time: Time: Time: Time:

Reference clock

WITH PAM4 CODING, A SIMPLE BER TEST IS NOT ENOUGH

Channel 1

Pre-FEC-BER:

Cor-CW:

CER:

FLR-64:

Est-CER:

Est-FLR:

Margin:

CodeWs:

Time:

FEC symbol error margin

BA-1600 Application

EXFO 106.25Gb/s PAM4

Unframed Clock Rate: 8

BER Configuration: Run Clear Force Relock Settings Help

| Number of Symbols | Ch 1 | Ch 2 | Ch 3 | Ch 4 | Ch 5 | Ch 6 | Ch 7 | Ch 8 |
|-------------------|------|------|------|------|------|------|------|------|
| 1 | 0 | 0 | 0 | 0 | 10 | 33 | 3 | 64 |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Error Count: AUI*PMD*AUI Mask PMD Mask AUI Mask

BER Monitor: Channel All TX Invert RX Invert Invert Dursor2: 0.00 % Pre Cursor1: -4.00 %

Amplitude: mV

Post 1-7:

Floating Position:

Floating Taps 8-11:

Lower Eye: Upper Eye:

FEC symbol error distribution plot

BA-1600 Application

EXFO 106.25Gb/s PAM4

Unframed Clock Rate: 8

BER Configuration: Run Clear Force Relock Settings Help

SNR:

Slicer1:

Slicer2:

Slicer3:

Slicer4:

Thid: 2/2:

Thid: 1/2:

Thid: 0/1:

Histogram Mon: Sequential Concur

Scale: Linear Lo

BER Monitor: Channel All TX Invert RX Invert Invert Dursor2: 0.00 % Pre Cursor1: -4.00 %

Amplitude: mV

Post 1-7:

Floating Position:

Floating Taps 8-11:

Lower Eye: Upper Eye:

Error Injection:

Channel histogram

TX Invert: RX Invert: Invert: Dursor2: % Pre Cursor1: %

Amplitude: mV

Post 1-7:

Floating Position:

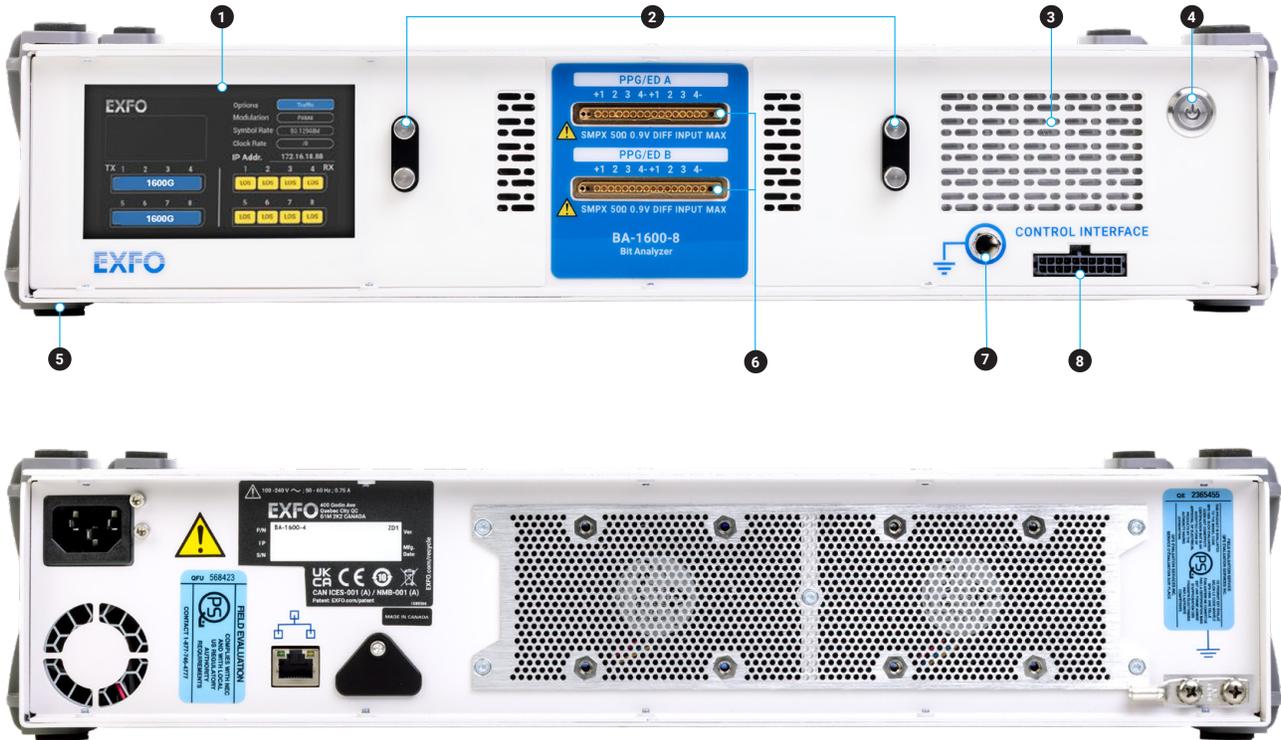
Floating Taps 8-11:

Lower Eye: Upper Eye:

14-tap mode

DESIGNED FOR HIGH-SPEED AND MULTISERVICE

- 1 Display 4.5 inch
- 2 MCB support bracket mount (optional)
- 3 Air inlet
- 4 Power button
- 5 Foot rest
- 6 RF user connectors (SMPX)
- 7 Grounding jack
- 8 MCB interface connector



SPECIFICATIONS

| SPECIFICATIONS | |
|---|--|
| Number of channels | 8 or 4 |
| Data rate per lane (GBd) | 106.25, 53.125 and 26.5625 |
| Data rate adjustment (ppm) | ±250 |
| PAM4 coding | Gray code |
| Pattern supported by PPG and ED | PPG: PRBS 7Q/9Q/10Q/11Q/13Q/15Q/20Q/23Q/31Q/49Q/58Q/SSPRQ/SQUARE_WAVE ED: PRBS 7Q/9Q/10Q/11Q/13Q/20Q/23Q/31Q/49Q/58Q ^a |
| PG maximum amplitude (mV _{ppd}) | 900 |
| Jitter RMS (mUI) | ≤23 |
| EOJ03 (mUI) | ≤25 |
| JH4u (mUI) | ≤135 |
| ED maximum level (mV _{ppd}) | 1200 |
| ED damage level (mV _{ppd}) | 1300 |
| TX multi tap pre-emphasis support | 10 fix taps + 4 floating taps ^b |
| Rx sensitivity (mV _{ppd}) | ≥300 ^c |
| Connector type | SMPX 1x16 |

| GENERAL SPECIFICATIONS | |
|------------------------|--|
| Size (H × W × D) | 115 mm × 465 mm × 300 mm (4.5 in × 18.3 in × 11.8 in) |
| Weight | ≤ 10 kg (22 lb) |
| Temperature | Operating: 5 °C to 40 °C (41 °F to 104 °F) Storage: -20 °C to 70 °C (-4 °F to 158 °F) |
| Relative humidity | 20% to 80% |
| Power | 100 Vac to 240 Vac (47 Hz to 63 Hz) 55 W typical / 80 W max. |

| MODULE COMPLIANCE BOARD (MCB) | |
|-------------------------------|--|
| Part number | EXFO- Wilder WMCB-OSFP-1.6T MCB SMPX-to-SMPX |
| Interface | OSFP1600 support |
| Direct SMPX connection | BA-1600-8 and BA-1600-4 |
| Power class | Class 4 and higher pluggable with cooling system |
| CMIS | CMIS control and I ² C read/write |

a. Only 13Q, 20Q, 23Q, 31Q, 49Q, 58Q patterns are supported in RX at 106.25 GBaud.

b. Max 14 UI away from fix taps.

c. BER <e-11 for the below channel conditions:
 - BA TX → 150mm Cable → Junction → 150mm Cable → BA RX
 - Optimal Transceiver tuning for the channel is applied
 - BA TX mV amplitude is then decrease from 900mV until BER hit e-11 (PRBS31Q)



ACCESSORIES

| | |
|---------|--|
| GP-3273 | RF loopback cable SMPX to SMPX 1×16 (qty: 1) |
| GP-3274 | RF fanout cable SMPX 1×16 to V 1.85 mm male (length = 15 cm) (qty: 1) |
| GP-3275 | RF fanout cable SMPX 1×16 to V 1.85 mm male (length = 30 cm) (qty: 1) |
| GP-3276 | BA-1600 MCB cable assembly (this is the low-speed CMIS control cable) (qty: 1) |
| GP-3277 | 19" relay rack mounting bracket + screws/HW |



GP-3273



GP-3274



GP-3275



GP-3276

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