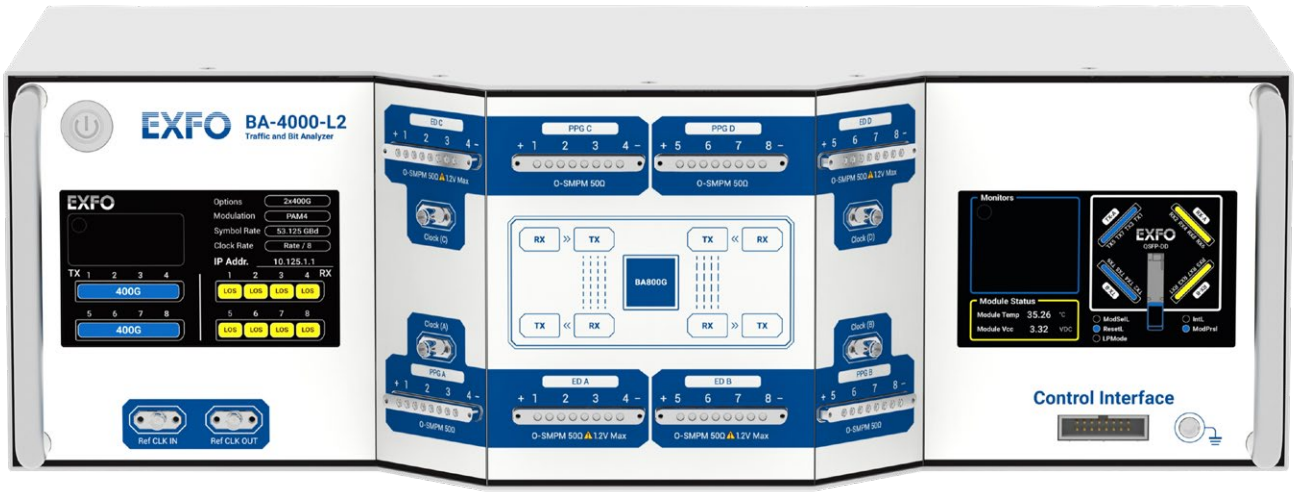
SPEC SHEET

BA-4000-L2 Traffic and Bit Analyzer

ADVANCED 800G TESTER OF L2 TRAFFIC PLUS L1 BER

- Combined L1 BER tester and L2 traffic analyzer for 800G transceivers including DR4/FR4/LR4 and linear-drive pluggable optics (LPO).



KEY FEATURES

- Inherits BA-4000 signal integrity and BER test function
- Powerful and user-friendly graphical user interface (GUI)
- L2 frame test
- Real-traffic FEC analysis
- Supports breakout cable testing scenario
- Latency testing for AI/ML transceiver
- Supports various frame sizes from 64 to 16000 bytes
- LPO testing supported by RCNC option

BA-4000-L2 READY FOR ADVANCED 800G TESTING

The BA-4000-L2 is an industry-leading 800G traffic analyzer and BER tester from L2 system view.

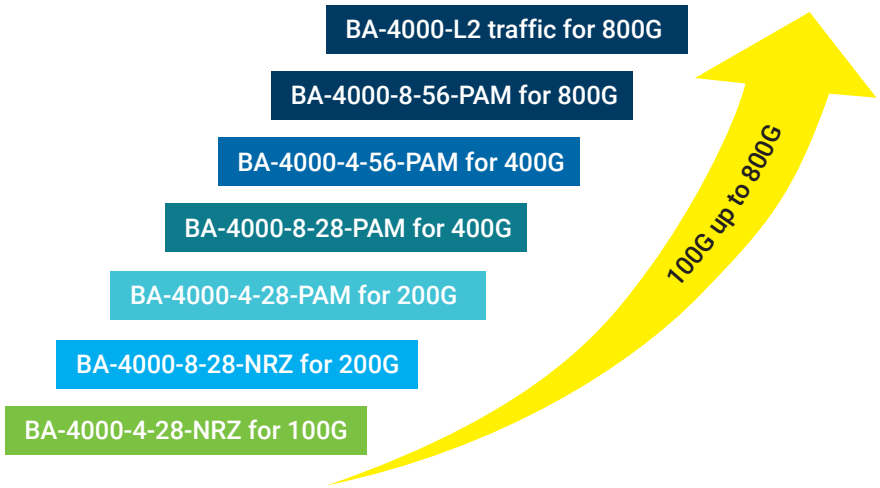


Figure 1. Part of the BA-4000 series of optical test solutions (from 100G to 800G+), the BA-4000-L2 features powerful layer-2 functions.

POWERFUL AND SIMPLIFIED USER INTERFACE

The BA-4000-L2 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.

Figure 2. User-friendly GUI.

COMBINED L1 BER TESTER AND L2 TRAFFIC ANALYZER

The BA-4000-L2 supports up to 32-tap feed-forward equalizer (FFE). It detects intersymbol interference (ISI) and far-end reflection.

Figure 3. Detect ISI and far-end reflection.

Monitor key parameters such as Rx/Tx frame counts and line utilization. Real-time FEC analysis provides testing of pre-FEC BER, symbol error distribution and FEC margin.

Figure 4. Test pre-FEC BER, symbol error distribution and FEC margin.

New RCNC hardware option enables LPO testing.

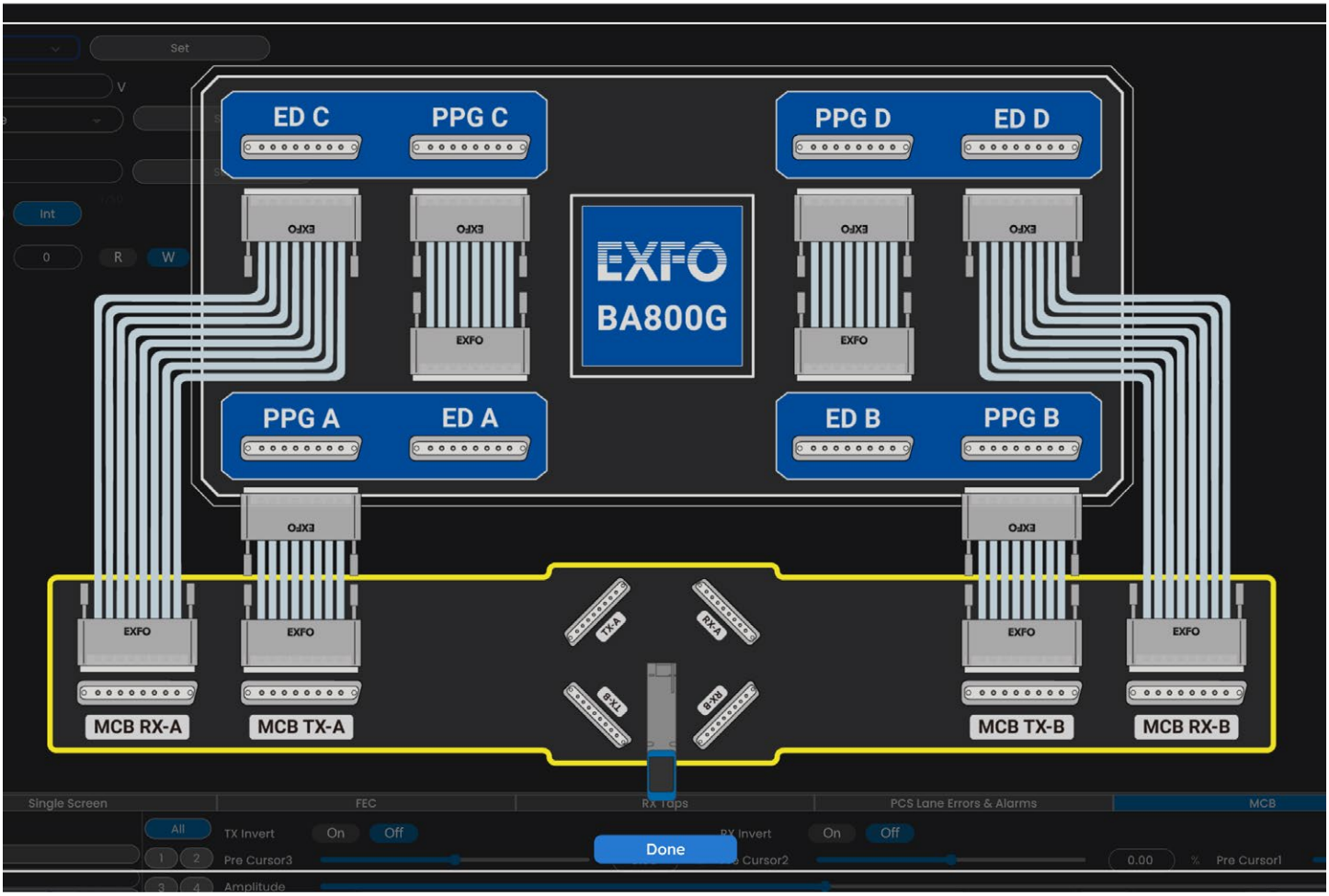


Figure 5. Switch to RCNC mode in GUI.

SPECIFICATIONS

All specifications are typical, at 23 °C ± 2 °C unless otherwise specified.

TECHNICAL SPECIFICATIONS	
High-speed interface	4×O-SMPM RF connector, 67 GHz bandwidth 8×O-SMPM RF connector, 67 GHz bandwidth (with RCNC option)
Modulation	PAM4
Symbol rate	53.125 GBd
Operation mode	Framed – 1×800G, 2×400G, 8×100G Unframed
Tx pre-emphasis	7 taps (3 pre-cursors, a main cursor, and 3 post-cursors)
Sub-eye height tuning	Lower eye, upper eye
Channel polarity	Tx inversion, Rx inversion
Rx equalizer	Auto adaptive CTLE, 32-tap FFE, and DFE Auto adaptive CTLE, 20-tap FFE with spurious noise and reflection cancellation **(RCNC mode and RCNC option required)**
General measurements	Frequency offset, pre-FEC error (count, rate) Tx/Rx frame count, Tx/Rx line utilization, correctable codeword count, frame loss ratio, FEC margin, test time, latency, frame check sequence (FCS), etc.
Ethernet alarms and errors	Link down, no traffic, pattern loss, local fault detected, local fault received, remote fault, LOA, local degraded SER detected, local degraded SER received, remote degraded SER, 66B block, FEC-UNCOR-CW, FEC-COR-CW, FEC-SYMB
PCS alarms	LOAML, excessive skew, invalid marker
Rx taps (channel simulation)	Channel response table, channel response plot
Frame distribution	Size analysis of <64, 64, 65 to 127, 128 to 255, 256 to 511, 512 to 1023, 1024 to 1518, 1591 to 1522, >1522
PCS lane info	Pre-FEC BER/SER per lane, LOMAL, excessive skew, invalid marker per lane, PCS lane mapping
Histogram	SNR, level deviation, threshold deviation, sub-eye height **(RCNC mode and RCNC option required)**
Frame size	64 to 16000 bytes (fixed, EMIX)
L2 MAC address	Source MAC address, destination MAC address, EtherType
Ethernet error injection type	FEC-UNCOR-CW, FEC-COR-CW, FEC-SYMB, 66B block
Pattern (unframed mode)	PRBS 15Q/31Q, only PPG supports PRBS13Q, SSPRQ and user-defined pattern
Maximum amplitude [a, b]	800 mV_{ppd}
PAM4 eye width (zero hit) [a]	6.0 ps
Sensitivity [c]	250mV_{ppd} and BER < e-10 250mV_{ppd} and BER < e-12 **(RCNC mode and RCNC option required)**
ED damage level	900mV_{ppd}
Resource embedded	User guide, API guide, sample code
Clock output	Amplitude > 400 mV, Ratio /8,/16,/32, /64 (trigger)
Reference clock	Sync with another unit to support 1.6T (16×100G), Reference clock output amplitude > 700 mV
Low-speed signal control interface	16-pin header to access transceiver through EXFO 800G MCB (QSFP-DD, OSFP, OSFP-RHS)
Transceiver access	Show low-speed signals, read/write I^2C register
LAN port TCP/IP	IP address, subnet mask, default gateway, and DHCP support

GENERAL SPECIFICATIONS		
Size (H × W × D)		139 mm × 443 mm × 229 mm (5 ½ in × 17 ½ in × 9 in)
Weight		≤ 10 kg (22 lb)
Temperature	Operating Storage	5 °C to 40 °C (41 °F to 104 °F) –20 °C to 70 °C (–4 °F to 158 °F)
Relative humidity		20 % to 80 % (80 % for temperatures up to 31 °C decreasing linearly to 50 % at 40 °C)
Power		100 to 127 V, 50/60 Hz 200 to 240 V, 50/60 Hz 400 W max.

a. PAM4 53.125 GBd signal measured by 50 GHz-bandwidth scope with 50 GHz 2.4 mm, 15 cm RF cable.

b. Support overdrive 900 mV_{ppd}

c. Measured by direct loopback from PPG to ED with 67 GHz-bandwidth O-SMPM, 20 cm RF cables.

ORDERING INFORMATION

BA-4000-XX-XX

Model
L2 = 800G 8-channel traffic analyzer and BER tester

Example: BA-4000-L2-RCNC

Option
RCNC = Add hardware for reflection cancellation, noise cancellation

TEST CONFIGURATION

Example configuration for OSFP transceiver test.

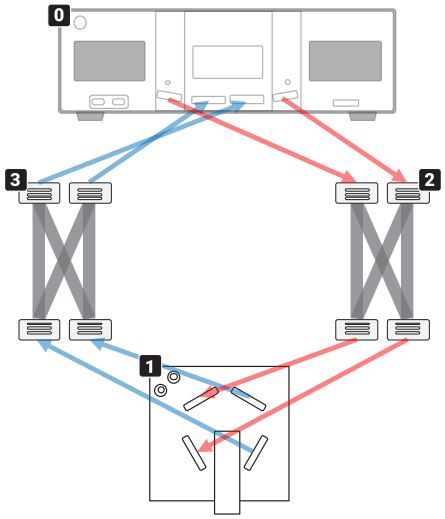
BA-4000-L2

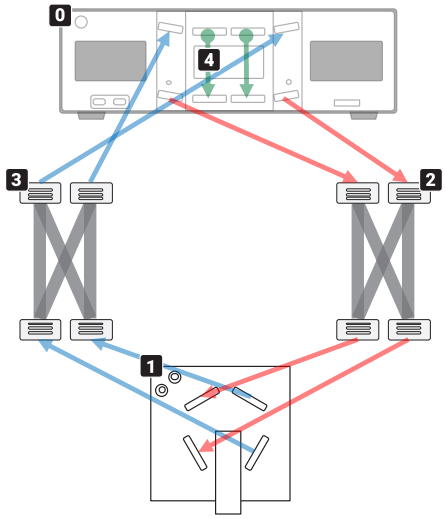
	MODEL NO.	DESCRIPTION	QTY
0	BA-4000-L2	Bit and Traffic Analyzer	1
1	MCB-**OSFP**-O	800G OSFP module compliance board (MCB)	1
2	ICBOS-40-**OSFP**-PPG	40 cm O-SMPM cable pair specified for [MCB-**OSFP**-O TX]	1
3	ICBOS-40-**OSFP**-ED	40 cm O-SMPM cable pair specified for [MCB-**OSFP**-O RX]	1

BA-4000-L2 with RCNC option

	MODEL NO.	DESCRIPTION	QTY
0	BA-4000-L2-RCNC	Bit and Traffic Analyzer with RCNC hardware option	1
1	MCB-**OSFP**-O	800G OSFP MCB	1
2	ICBOS-40-**OSFP**-PPG	40 cm O-SMPM cable pair specified for [MCB-**OSFP**-O TX]	1
3	ICBOS-40-**OSFP**-ED	40 cm O-SMPM cable pair specified for [MCB-**OSFP**-O RX]	1
4	ICBOS-OS-20 [a]	20 cm O-SMPM loopback cable	2

a. Standard accessories of RCNC option.





EXFO headquarters **T** +1 418 683-0211 **Toll-free** +1 800 663-3936 (USA and Canada)

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