

G800GE-02 OSFP800 & QSFP-DD800 800GE BERT, FEC, L2 Test Systems

Spend less time finding problems and more time solving them

Challenge: Finding Problems Faster and Earlier in the 800GE Development Cycle

800 Gigabit Ethernet (GE) technologies based on the 106.25Gb/s electrical lane signaling rates have exponentially increased the level of complexity for the development of stable port electronics in all networking devices. Now, the challenge has become characterizing and quantifying the actual bit error ratio (BER) and forward error correction (FEC) performance of IEEE802.3ck and IEEE802.3bs compatible silicon devices, application-specific integrated circuits (ASICs), optical transceivers, and fiber and copper interconnects. Quickly identifying BER and FEC performance problems at 1x800GE, 2x400GE, 4x200GE, 8x100GE and 8x100GE (ck) Ethernet port speeds is critical, as the resolution and implementation of potential solutions is complex and time-consuming. The G800GE-02 reduces this cycle time. The G800GE-02 support the testing of 400GE technologies based on 53.125Gb/s electrical lane signaling to validate the performance of 1x400GE, 2x200GE, 4x100GE, and 8x50GE optical transceivers and fiber interconnects.

Solution: A simplified, affordable BERT, FEC, and L2 packet blast test system

Keysight's G800GE-02 test systems make the challenge of qualifying BER, FEC symbol error correction performance and line rate traffic stress testing on 800GE electronic devices easier and affordable. Whether validating chips, optical transceivers, or the port electronics of networking equipment, the G800GE-02 is a purpose-built test system with 106.25Gb/s and 53.125Gb/s electrical lane signaling per port that gives you the ability to find a problem in minutes, not hours. It shows a system-level view of the BER and FEC performance, at full line rate, of all the lanes and on the ports, over all the Ethernet speeds, as required, all at once, in real time.



Figure 1. G800GE-02 FEC Layer 1-2 test systems

Highlights

- Validate the BER performance of optical transceivers, active and passive copper cables, silicon devices with the G800GE-02 800GE BERT, FEC and packet blast test capabilities with Keysight's KiOS browser application.
- Find problems faster with KiOS browser-based single page application (SPA), system-view of all the BERT, FEC, and packet statistics of all the lanes or ports with 1x800GE, 2x400GE, 4x200GE, 8x100GE and 8x100GE (ck) and 1x400GE, 2x200GE, 4x100GE and 8x50GE Ethernet speed support.
- Measure full line rate BER, FEC, and L2 packet performance in minutes, not hours — evaluate optical transceivers, copper interconnects and silicon devices BER at *all Ethernet speeds simultaneously* with Keysight's patented Enhanced BERT option (that is, BERT inferred FEC).
- Perform long-duration (timed tests) and stress tests by using Keysight's KP4 FEC symbol bit error density distribution analysis—excellent for catching bursty errors that occur over time.
- Connect any G800GE-02 to **Keysight's M8040A high-performance BERT analyzer** or the **Infiniium UXR-Series Oscilloscopes** for advanced FEC-aware physical layer test and validation of IEEE802.3ck, and OIF CEI-112G or CEI-56 IA specifications.
- Connect a module compliance board or your device eval board by using the G800GE-02 electrical coaxial cabling interface. All the features and options are available over the coaxial cable interface

The G800GE-02 test system is a compact benchtop chassis. It may also be installed on a rackmount, as required. The G800GE-02 is provided with the Layer 1 BERT, FEC, and Layer 2 test software called KiOS. The KiOS single-page application (SPA) uses the Google Chrome browser implementation. It makes set up so easy and fast that you can start testing and generating PASS/FAIL test reports by using your tolerance and limits within minutes. KiOS has REST API and Python library to facilitate a rapid build of test automation suites.

G800GE-02 chassis are available in four models:

- G800GE OSFP-02, 800GE, 2-port OSFP800, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0086).
- G800GE OSFP-COAX-02, 800GE, 1-port OSFP800, 1-port electrical coax breakout, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0087).
 - The 941-0087 is recommended for use with the Keysight M8040A BERT Analyzer, and the Infiniium UXR-Series Oscilloscopes.
- G800GE QSFP-DD-02, 800GE, 2-port QSFP-DD800, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0088).

- G800GE QSFP-DD-COAX-02, 800GE, 1-port QSFP-DD800, 1-port electrical coax breakout, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0089).
 - We recommend the 941-0089 for use with the Keysight M8040A BERT Analyzer, and the Infiniium UXR-Series Oscilloscopes.
- All models include support for 1x800GE, 2x400GE, 4x200GE, 8x100GE and 8x100GE (ck), plus 1x400GE, 2x200GE, 4x100GE and 8x50GE Ethernet speeds, BER test, FEC test, and Layer 2 packet blast capabilities. No additional option purchase is necessary for complete Ethernet speed support.
 - Advanced options such as BERT inferred FEC, FEC codeword trigger and capture, and synchronization to the Keysight's Layer 1 instruments are available as purchased options. Both factory installed and field upgrade options are available.

The RS-544 (KP4) FEC symbol error correction test capability simplifies FEC testing over electrical lanes, just as easily as the built-in Layer 1 BER features. Keysight's FEC codeword bit-error density distribution analysis (the FEC tail) shows the symbol error correction performance, error density distribution, FEC margin, and Frame Loss Ratio (FLR), as well as many other advanced and useful measurements. It is an excellent system to use to perform long-duration performance and stress tests. It simply cannot be made any easier to use.

The patented Enhanced BERT option with BERT-inferred FEC analysis provides your development teams test capabilities to quickly pinpoint problems and to predict excellent or poor BER and FEC symbol error correction performance on a given device. This feature analyzes all the Ethernet speeds that the given device supports, simultaneously with the full statistical analysis of the G800GE-02 made available, all at once.

Innovation on the G800GE-02 did not stop at the Enhanced BERT-inferred FEC option. The G800GE-02 offers a FEC Trigger and Capture option. This feature provides deep insight into exactly where the bit errors are located inside a FEC codeword for all speeds. You can set the Ethernet speed, trigger logic, trigger bit error, or FEC codeword error thresholds as to how many and which bit-errors or FEC symbol errors you want to capture. Then, a graphics capture display shows where the bit errors occurred and provides a summary analysis report of the events that occurred in a structured and organized manner.

Pay as You Grow — All options are Field Upgradeable

G800GE-02 upgrades extend the reuse of the chassis system and improves your ROI. The ability to upgrade the G800GE-02 to have it grow with your test needs is quick and easy. You can field-upgrade any G800GE-02 chassis with the following options:

- Enhanced BERT with BERT-inferred FEC—a powerful analysis tool.
- FEC Codeword Trigger and Capture—shows where the bit errors occur in the captured FEC codeword.
- Synchronizing to the Keysight M8040A BERT test system allows the G800GE-02 to be synchronized with Keysight's M8040A high-performance BERT analyzer or the Infiniium UXR-Series Oscilloscopes for advanced FEC-aware physical layer test and validation, IEEE802.3ck and OIF CEI-112G, or IEEE802.3bs and CEI-56G IA specifications.

These options greatly enhance the built-in BERT and FEC test features.

The G800GE-02 chassis can be upgraded in the field to support interconnection and synchronization with Keysight's M8040A high-performance BERT analyzer. The combined system is a symbol striped FEC-aware physical layer BER tester for 106.25Gb/s and 53.125Gb/s electrical lanes. It is a solution for 800GE characterization, stress, and conformance tests, and to perform physical layer channel stress and impairment of a channel. Additionally, advanced tests such as TDECQ and optical receiver stress testing (ORST) may be performed for optical transceivers in conjunction with various Keysight layer 1 instruments such as a real-time oscilloscope, and other equipment and accessories depending on the application.

The configurations of the G800GE-02 chassis with the electrical coaxial interface allow full Tx and Rx channel connections to Module and Host Compliance electrical breakout boards, or connection to your development test board systems or to test chips on development boards and optical transceiver, or passive copper cable development hardware.

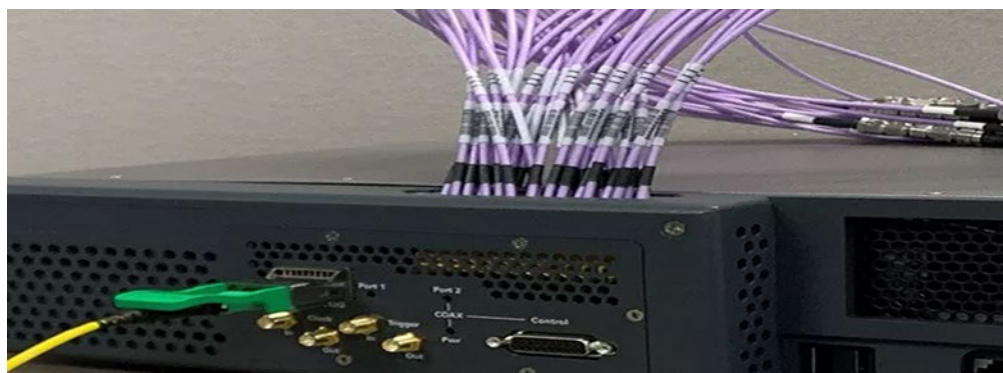


Figure 2. G800GE-02 coaxial electrical cable interface 2.4mm connections. The coaxial electrical cable assembly is not sold by Keysight. It must be purchased directly from the approved manufacturer. Please consult your Keysight sales account manager for more information and how to purchase.

Mix and match whatever upgrades you require, whenever you need them. You are no longer stuck with a dedicated piece of hardware with no hope of extending its capabilities. With G800GE-02, you have the critical return on investment (ROI) for today's and tomorrow's test needs.

Key features

- The G800GE-02 is an excellent test platform for 800GE communications devices, optical transceivers, copper interconnects, and networking hardware ports that use the 8x106.25Gb electrical interface with PAM4 encoding that is IEEE802.3ck compliant.
- The 400GE and related speed support provides testing of optical transceivers and fiber interconnects. The G800GE-02 supports testing of passive copper DACs with the 53.125Gb/s lane support, however there is no auto-negotiation (AN) or Link Training (Lt) support in this lane speed mode.
- Built-in Ethernet speed support for 1x800GE, 2x400GE, 4x200GE, 8x100GE, 1x400GE, 2x200GE, 4x100GE and 8c50GE for BER, FEC symbol error correction performance and line rate packet blast measurements for 106.25 and 53.125Gb/s based electrical lane speeds.
- Built-in RS(544,514) also known as KP4 FEC test capability:

- FEC symbol error distribution analysis with a comprehensive set of FEC corrected and uncorrected count and rate statistics, including BER statistics for FEC analysis.
 - Extensive per-port and per-lane FEC statistics for all supported speeds: 800GE and 400GE.
 - Advanced measurements such as pre-FEC BER and frame loss ratio (FLR).
- A highly intuitive, fast, and efficient web-browser-driven UI that is supported by Google Chrome. It makes BER and FEC testing truly fast and simple.
- A REST API and Python library for scripting is installed with the KiOS software on the chassis.
- The Layer 1 BERT provides PRBS31Q and PRBS13Q patterns. It generates per-lane BER measurements with a broad array of additional statistics.
- It can transmit SSPRQ100 patterns, however, that requires the Enhanced BERT option and a Keysight real-time oscilloscope.
- The G800GE electrical coaxial interface supports the Samtec BULLS EYE connector and cable assembly technology. This is used to connect to a Module Compliance Board.
 - Keysight supports the Samtec 50GHZ rated cables that are 500mm (19.6 inches) in length and insert into the header connector of the assembly installed into the G800GE or G800GE-02 chassis. The cables are terminated with a 2.4mm co-axial round connector.*
 - *NOTE: The Samtec BULLS EYE coaxial cable assembly is not sold by Keysight. Please contact your Keysight sales account manager for more information and how to purchase.
- Hardware Clock IN and Clock OUT interface to receive a clock in from an external device, or it can output the internal clock from the G800GE-02 test system.
- +/- 105 PPM line frequency adjustment that is applied to all enabled ports across the G800GE-02 test system.
- Support for QSFP-DD800 and OSFP800 MSA compatible optical transceiver that have 106.25Gb/s electrical lane interfaces.
- Support for QSFP-DD and OSFP MSA compatible optical transceiver that have 53.125Gb/s electrical lane interfaces.
- Common Management Interface Specification (CMIS) support for v5.0, v4.0, and v3.0, user selectable, or use the version auto-detection feature; CMIS is for optical transceivers, active optical cables, active electrical cables, and copper interconnects. It enables the ability to read and write the management registers of the transceiver or other interconnect devices.
- Support for a Rx Eye Scan and bathtub plot for 106.25 Gb/s and 53.125 Gb/s lanes.
- Support for 800GE and 400GE copper cable interconnects such as passive copper DACs up to 2.0 meters in length, plus AEC's, and ACC's.
- LT support for 800GE passive copper cables and ACC's is up to two meters in length for all Ethernet speeds: 1x800GE, 2x400GE, 4x200GE, and 8x100GE.
 - LT is not supported for 400GE passive copper cables.
- Simulate a manual cable or optical transceiver disconnect from the KiOS user interface.
- Host to Module support provides default and user-selectable Tx host equalization controls for optical and electrical interfaces with user adjustable custom settings for all lanes, or on any individual lane.
- A profile can be created for an optical transceiver, saved, and recalled as required.

- Option for enhanced BERT and BERT-inferred FEC measurement capability. Evaluate new optical transceivers based on 106.25Gb/s and 53.125Gb/s electrical lane interfaces BER at all Ethernet speeds simultaneously with the patented Enhanced BERT option:
 - Factory installed and field upgrade options requires KiOS 4.0 as the minimum software.
 - In-depth analysis of mismatched PAM4 multi-level signal errors.
 - SSPRQ100 pattern generation for 100G lane applications (requires a Keysight real-time oscilloscope).
 - BERT Inferred FEC for faster analysis of FEC over all Ethernet speeds.
 - A threshold bit-error tool to expose difficult-to-find bursty errors in PRBSQ patterns.
- Option for FEC Codeword Trigger and Capture:
 - Shows where the bit errors occurred in the captured FEC codeword in a color-coded graphics display.
 - User-defined trigger thresholds to set bit error minimum and maximum for the FEC codeword capture with logic-driven condition settings (that is, $\leq$, $\geq$, AND).
 - User can specify bit error range, or the FEC symbol error range, or trigger on uncorrectable errors only by using logic-driven conditional settings.
- Option to support interconnection and synchronization with Keysight's M8040A High Performance BERT analyzer. The combined system is a symbol striped FEC-aware physical layer BER and FEC-aware tester.
- For all options, see the Ordering Information section of this data sheet.

Chassis Hardware Specifications

Product description	G800GE-02: 2-ports of the OSFP800 interface 2-ports of the QSFP-DD800 interface	G800GE-02: 1-port of the OSFP800 interface, 1-port coaxial Tx/Rx 1-port of the QSFP-DD800 interface, 1-port coaxial Tx/Rx
	Chassis physical and electrical specifications	
Part numbers	941-0086, 941-0088	941-0087, 941-0089
Physical interfaces	• 2-ports of the OSFP800 MSA form factor • 2-ports of the QSFP-DD800 MSA form factor	• 1-port of the OSFP800 MSA form factor with 1-port of coaxial electrical Tx/Rx interface cable system • 1-port of the QSFP-DD800 MSA form factor with 1-port of coaxial electrical Tx/Rx interface cable system • NOTE: The Samtec BULLS EYE coaxial cable assembly is not sold by Keysight. Please contact your Keysight sales account manager for more

Product description	G800GE-02: 2-ports of the OSFP800 interface 2-ports of the QSFP-DD800 interface	G800GE-02: 1-port of the OSFP800 interface, 1-port coaxial Tx/Rx 1-port of the QSFP-DD800 interface, 1-port coaxial Tx/Rx
	information and how to purchase.	
Electrical coaxial cable interface	The G800GE electrical coaxial interface supports the Samtec BULLS EYE® connector and cable assembly technology.* - There are 16 Tx and 16 Rx cables that provides a complete electrical interface for 8x106.26 Gb/s and 53.125Gb/s Tx and Rx lanes. - Keysight qualified the Samtec part number BE40A-S-24SP-2-2-16-0500. The 50GHZ rated cables are 500mm (19.6 inches) in length and insert into the header connector of the assembly installed into the G800GE or G800GE-02 chassis. The BE40A-S-24SP-2-2-16-0500 configures the bulls' eye, double row, connector, and cable assembly and is common to the G800GE and G800GE-02 chassis. - The cables are terminated with a 2.4mm co-axial round connector. *Note: This coaxial cable assembly is not sold by Keysight Technologies. The end-user must purchase this assembly directly from Samtec. Please consult your Keysight sales account manager for more information and how to purchase.	
Chassis configurations	2-port desktop chassis system. May be set up as a rackmount, 2 RU	
Ethernet per port electrical lane and speed support	106.25 Gb/s host electrical lanes: 1x800GE, 2x400GE, 4x200GE, 8x100GE and 8x100GE(ck) 53.125 Gb/s host electrical lanes: 1x400GE, 2x200GE, 4x100GE, and 8x50GE	
Interconnect media support	106.25 Gb/s host electrical lanes supports: 800GE-capable optical transceivers, fiber cables, and AOCs 800GE-capable AECs, ACCs, and passive copper cables - Auto-negotiation (AN) and link training (LT) 53.125 Gb/s host electrical lanes supports: 400GE-capable optical transceivers, fiber cables, and AOCs 400ZR/ZR+ coherent optical transceivers 400GE-capable AECs, - ACCs and passive copper cable support without AN and LT. Requires use the Transmit pre-emphasis tap settings	
Chassis connector systems	Power ON/OFF button 1 LED per port Clock IN / OUT: 2 SMA female connectors Trigger IN / OUT: 2 SMA female connectors 4 USB: (2) USB 2.0 (2) USB 3.0 compatible ports 1 RJ45: 1000/100/10Mbps Ethernet management port 1 Display Port, supports a maximum resolution of 4096 x 2304 @60Hz	
Chassis clock IN – electrical specifications	Frequency: 166.015625 MHz +/- 105 PPM 50-ohm termination Minimum = 0.5 Vpk-pk = 0.18 Vrms (sine) Maximum = 3.0 Vpk-pk = 1.06 Vrms (sine)	
Chassis clock OUT – electrical specifications	Frequency: 166.015625 MHz +/- 105 PPM HCSL, 50-ohm VOH > 0.55 V, VOL < 0.15 V, Swing > 0.55 V	

Product description	G800GE-02: 2-ports of the OSFP800 interface 2-ports of the QSFP-DD800 interface	G800GE-02: 1-port of the OSFP800 interface, 1-port coaxial Tx/Rx 1-port of the QSFP-DD800 interface, 1-port coaxial Tx/Rx
Hardware trigger IN/OUT – electrical specifications	Trigger In: 50 ohm termination; Minimum = -1.0 V, Maximum = +4.0 V, Swing > 0.2 V Trigger Out: HCSL, 50 ohms; VOH > 0.55 V, VOL < 0.15 V, Swing > 0.55 V	
Chassis system electrical power	Operates on 100-240 VAC, 50/60 Hz: • 8 Amps on 100-125 VAC • 4 Amps on single phase, 200-240 VAC G800GE-02 OSFP chassis is shipped with (1 each) 100-125 VAC North American power cord. Options for international shipments are selected at the time of order placement.	
Chassis system dimensions	13.2" (D) x 17.4" (W) x 3.65" (H) 335 mm (D) x 442 mm (W) x 92.65 mm (H)	
Chassis system weights	Hardware only: 21.75 lbs. (9.87 kg) Shipping: 30.49 lbs. (13.83 kg) Includes rackmount slides, cable support bracket, power cord, accessories, and packaging	
Temperature (ambient air)	Operating: 41 °F to 95 °F (5 °C to 35 °C) Storage: 41 °F to 122 °F (5 °C to 50 °C)	
Humidity (ambient air)	Operating: 0% to 80%, non-condensing Storage: 0% to 80%, non-condensing	
Optical transceiver power consumption support	The G800GE-02 optical transceiver front panel port can support up to 25 watts of power consumption MSA compliant 800GE and 400GE optical transceivers under the following conditions: • OSFP800 and OSFP are up to 18 watts of power consumption with an ambient air temperature of 35 °C (95 °F) • OSFP800 and OSFP are up to 25 watts of power consumption with an ambient air temperature of 25 °C (77 °F) • QSFP-DD800 and QSFP-DD are 25 watts of power consumption with an ambient air temperature of 35 °C (95 °F)	
Industry specifications support	• Common Electrical I/O (CEI) 112G IA • Common Electrical I/O (CEI) 56G IA • IEEE 802.3ck Physical Layer Specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s Electrical Interfaces Based on 100 Gb/s Signaling • IEEE 802.3bs Media Access Control Parameters, Physical Layers and Management Parameters for 200 Gb/s and 400 Gb/s Operation	
Safety	• EN 62368-1 / IEC 62368-1 • UL 62368-1 / CSA C22.2 No. 62368-1-19	
Emissions and immunity	• FCC Part 15B, Class A • ICES-003 • EN 55032/35 • AS/NZS CISPR 32 • KS C 9832/35	
Regulatory approvals	• CE (Europe) • UL (USA, Canada) • RCM (Australia, New Zealand) • UKCA (United Kingdom) • KCC (Korea)	
Environmental	RoHS Directive 2011/65/EU; Annex II, Directive (EU) 2015/863	

Product description	G800GE-02: 2-ports of the OSFP800 interface 2-ports of the QSFP-DD800 interface	G800GE-02: 1-port of the OSFP800 interface, 1-port coaxial Tx/Rx 1-port of the QSFP-DD800 interface, 1-port coaxial Tx/Rx
	· WEEE Directive 2012/19/EU · China RoHS · Russia RoHS	

Application Support

G800GE-02 OSFP800 and QSFP-DD800

Browser support: The G800GE-02 chassis and features are supported on the Google Chrome cross-platform browser. We recommend you upgrade to the latest version of the browser. Other browsers such as Firefox, Safari, Internet Explorer, and Microsoft Edge may function at a sub-optimal experience.

KiOS: Operating system software for the G800GE-02 Layer 1 BERT and FEC test 800GE wire-rate signal generation and measurement analysis with optional support for Forward Error Correction measurement, and synchronization with the Keysight M8040A High Performance BERT analyzer for physical layer applications.

REST API: Support for overall test automation, managing the chassis, ports, logs, CMIS, license, test plans, configuring tests, and accessing and gathering BERT and FEC measurement and statistics.

Python library: KiPY is a Python library that enables REST calls to KiOS on the G800GE-02 to allow use of a Python script to do the same things you do from the GUI, such as changing system settings, viewing stats, and reading and writing CMIS registers

Ordering Information

G800GE-02 OSFP800, OSFP800-COAX, QSFP-DD800, and QSFP-DD800-COAX chassis systems

941-0086

Ixia, G800GE OSFP-02, 800GE, 2-port OSFP800 Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0086) that includes the latest version of the KiOS software. Chassis includes the 1x800GE, 2x400GE, 4x200GE, and 8x100GE speed support over 106.25Gb/s lanes and 1x400GE, 2x200GE, 4x100GE and 8x50GE speed support over 53.125Gb/s lanes with BERT, Forward Error Correction, and packet blast measurement capability. Includes support for optical transceivers, AECs, AOCs, and passive copper DACs. Please reference the product datasheet for additional information on interconnect support.



941-0087

Keysight, G800GE OSFP-COAX-02, 800GE, 1-port OSFP800, 1-port electrical coax breakout, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0087) that includes the latest version of the KiOS software. Chassis includes the 1x800GE, 2x400GE, 4x200GE, and 8x100GE speed support for 106.25 Gb/s host electrical lanes, and 1x400GE, 2x200GE, 4x100GE, and 8x50GE for 53.125 Gb/s host electrical lanes with BERT, Forward Error Correction, and packet blast measurement capability. Includes software and front panel connector support for Module Compliance Boards on the coaxial port of the chassis, optical transceivers, AECs, AOCs, and passive copper DACs. Please reference the product datasheet for additional information on interconnect support. NOTE: The electrical coaxial cable assembly is not sold nor supplied by Keysight. It must be purchased directly from the vendor, Samtec. Please contact your Keysight account manager for information to purchase the coaxial cable assembly and accessories.



941-0088

Ixia, G800GE QSFP-DD-02, 800GE, 2-port QSFP-DD800 Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0088) that includes the latest version of the KiOS software. Chassis includes the 1x800GE, 2x400GE, 4x200GE, and 8x100GE speed support over 106.25Gb/s lanes and 1x400GE, 2x200GE, 4x100GE and 8x50GE speed support over 53.125Gb/s lanes and Forward Error Correction measurement capability with BERT, Forward Error Correction, and packet blast measurement capability. Includes support for optical transceivers, AECs, AOCs, and passive copper DACs. Please reference the product datasheet for additional information on interconnect support.



941-0089

Ixia, G800GE QSFP-DD-COAX-02, 800GE, 1-port QSFP-DD800, 1-port electrical coax breakout, Layer 1 BERT, FEC and L2 test and measurement system, fixed chassis (941-0089) that includes the latest version of the KiOS software. Chassis includes the 1x800GE, 2x400GE, 4x200GE, and 8x100GE speed support for 106.25 Gb/s host electrical lanes, and 1x400GE, 2x200GE, 4x100GE, and 8x50GE for 53.125 Gb/s host electrical lanes with BERT, Forward Error Correction, and packet blast measurement capability. Includes software and front panel connector support for Module Compliance Boards on the coaxial port of the chassis, optical transceivers, AECs, AOCs, and passive copper DACs. Please reference the product datasheet for additional information on interconnect support. NOTE: The electrical coaxial cable assembly is not sold nor supplied by Keysight. It must be purchased directly from the vendor, Samtec. Please contact your Keysight account manager for information to purchase the coaxial cable assembly and accessories.



G800GE chassis enhanced BERT options

All the following options apply to the original G800GE chassis and the new G800GE-02 chassis:

905-1102

Ixia, G800GE, Option, FACTORY INSTALLED, Enhanced BERT, FEC trigger and capture option for the G800GE Layer 1 BERT and FEC test systems. This option provides in-depth analysis of BERT Inferred FEC for faster analysis of FEC over all Ethernet speeds: 1x800GE, 2x400GE, 4x200GE, 8x100GE over 106.25 Gb/s lanes and 1x400GE, 2x200GE, 4x100GE and 8x50GE over 53.125 Gb/s lanes. It supports and SSPRQ100 pattern generation for 106.25 Gb/s and 53.125 Gb/s lane applications. It includes the FEC trigger and capture feature for all speeds to provide the ability to capture FEC data across any FEC lane meeting the criteria set by the user. An external trigger can be enabled. This entire option is applied to all ports on a single G800GE or a G800GE-02 Layer 1 BERT and FEC test system. This option applies to all the G800GE-02 chassis: 941-0086, 941-0087, 941-0088 and 941-0089.

905-1103

Ixia, G800GE, Option, FIELD UPGRADE, Enhanced BERT, FEC trigger and capture option for the G800GE Layer 1 BERT and FEC test systems. This option provides in-depth analysis of BERT Inferred FEC for faster analysis of FEC over all Ethernet speeds: 1x800GE, 2x400GE, 4x200GE, 8x100GE over 106.25 Gb/s lanes and 1x400GE, 2x200GE, 4x100GE and 8x50GE over 53.125 Gb/s lanes. It supports and SSPRQ100 pattern generation for 106.25 Gb/s and 53.125 Gb/s lane applications. It includes the FEC trigger and capture feature for all speeds to provide the ability to capture FEC data across any FEC lane meeting the criteria set by the user. An external trigger can be enabled. This entire option is applied to all ports on a single G800GE or a G800GE-02 Layer 1 BERT and FEC test system. This option applies to all the G800GE-02 chassis: 941-0086, 941-0087, 941-0088 and 941-0089. G800GE chassis options to synchronize to the M8040A BERT analyzer

905-1090

Ixia, G800GE, Option, FACTORY INSTALLED. Synchronize to Keysight bit-error rate tester (BERT) and trigger to external Keysight UXR real-time oscilloscope equipment, FEC trigger and capture option for the G800GE 800GE and 400GE Layer 1 BERT and FEC test systems. This entire option is applied to a single G800GE or a G800GE-02 test system to allow it to connect to a single external Keysight equipment at a time. This option applies to all the G800GE-02 chassis: 941-0086, 941-0087, 941-0088 and 941-0089.

905-1091

Ixia, G800GE, Option, FIELD UPGRADE. Synchronize to Keysight bit-error rate tester (BERT) and trigger to external Keysight UXR real-time oscilloscope equipment, FEC trigger and capture option for the G800GE 800GE and 400GE Layer 1 BERT and FEC test systems. This entire option is applied to a single G800GE or a G800GE-02 test system to allow it to connect to a single external Keysight equipment at a time. This option applies to all the G800GE-02 chassis: 941-0086, 941-0087, 941-0088 and 941-0089.

G800GE upgrade options: G800GE conversion to G800GE-02 chassis

Return-to-factory upgrades are available for existing G800GE units in the field. This extends the useful life of the unit and enables new features, the primary one being copper cable support. Please see the Upgrade Benefit Matrix below.

The upgrade options provide the ability to return the original G800GE chassis part numbers shown below to have them upgraded to the G800GE-02 hardware version at the Keysight factory. The upgrades are return-to-factory only.

The upgrades are for the installed base of G800GE 1st GEN HW chassis: 941-0082, 941-0083, 941-0084, and 941-0085.

The upgrades convert the existing part number of the original chassis that was purchased and converts it to the new chassis part number. The chassis retains the original serial number. This allows the original warranty to continue if it has not expired. It allows a future renewal of extended warranty under the new part number from the upgrade for that serial number chassis.

- Passive copper Direct Attached Cables (DAC) up to 1.5 meters in length
- Upgrade to a new SERDES chip that has better BER performance and is an MR rated chip for insertion loss
- Future support for 400GE Ethernet speeds based on 53.125 Gbs/ lanes with PAM4 encoding. This capability supports optical transceivers and active electrical cables. There is no copper cable support for 400GE passive DACs
- New features in the next KiOS software release

G800GE-02 upgrade benefit matrix	G800GE	G800GE-02
400G-ZR/ZR+ optics support	X	Yes
400GE Passive copper cable support up to 2.0-meters in length	X	X
400GE Ethernet speed support of 53.125 Gb/s lanes with PAM4 encoding	X	Yes
800GE Passive and active copper cable support up to 2.0-meters in length	X	Yes
Link Training (LT) support for all Ethernet speeds: 1x800GE, 2x400GE, 4x200GE, 8x100GE(ck) and 8x100GE	X	Yes
Auto-negotiation support for all Ethernet speeds: 1x800GE, 2x400GE, 4x200GE, 8x100GE(ck) and 8x100GE	X	Yes
Support for +/- 105 ppm clock frequency adjustment. This is applied	X	Yes

to both ports of the G800GE-02 chassis		
Support for Rx Eye Diagnostic Bathtub plot	X	Yes

942-1401

Ixia, UPG-G800GE-DAC-PHY, passive copper DAC HW support. RETURN to FACTORY UPGRADE for G800GE 800GE chassis (942-1401). The upgrade is for 941-0082 fixed chassis only. This is a return-to-factory hardware upgrade where the chassis existing front panel electronics are replaced by new, enhanced, front panel electronics. The upgrade provides support for optical transceivers, active electrical cables (AEC), active optical cables (AOC), and passive copper cables (DAC). Refer to the product datasheet for additional information for support of interconnects. NOTE: It is mandatory to provide the serial number of the unit to be upgraded on the quotation and at the time of order placement. Note2: The unit that is targeted for the upgrade must be returned to Keysight using the standard RMA process through the Keysight Ixia Support organization as a Return and Repair RMA.

942-1402

Ixia, UPG-G800GE-DAC-PHY, passive copper DAC HW support. RETURN to FACTORY UPGRADE for G800E 800GE chassis (942-1402). The upgrade is for 941-0083 G800GE fixed chassis only. This is a return-to-factory hardware upgrade where the chassis existing front panel electronics are replaced by new, enhanced, front panel electronics. The upgrade provides support for optical transceivers, active electrical cables (AEC), active optical cables (AOC), and passive copper cables (DAC). Refer to the product datasheet for additional information for support of interconnects. NOTE: It is mandatory to provide the serial number of the unit to be upgraded at the time of order placement. Note2: The unit that is targeted for the upgrade must be returned to Keysight using the standard RMA process through the Keysight Ixia Support organization as a Return and Repair RMA.

942-1403

Ixia, UPG-G800GE-DAC-PHY, passive copper DAC HW support. RETURN to FACTORY UPGRADE for G800E 800GE chassis (942-1403). The upgrade is for 941-0084 G800GE fixed chassis only. This is a return-to-factory hardware upgrade where the chassis existing front panel electronics are replaced by new, enhanced, front panel electronics. The upgrade provides support for optical transceivers, active electrical cables (AEC), active optical cables (AOC), and passive copper cables (DAC). Refer to the product datasheet for additional information for support of interconnects. NOTE: It is mandatory to provide the serial number of the unit to be upgraded at the time of order placement. Note2: The unit that is targeted for the upgrade must be returned to Keysight using the standard RMA process through the Keysight Ixia Support organization as a Return and Repair RMA.

942-1404

Ixia, UPG-G800GE-DAC-PHY, passive copper DAC HW support. RETURN to FACTORY UPGRADE for G800E 800GE chassis (942-1404). The upgrade is for 941-0085 G800GE fixed chassis only. This is a return-to-factory hardware upgrade where the chassis existing front panel electronics are replaced by new, enhanced, front panel electronics. The upgrade provides support for optical transceivers, active electrical cables (AEC), active optical cables (AOC), and passive copper cables (DAC). Refer to the product datasheet for additional information for support of interconnects. NOTE: It is mandatory to provide the serial number of the unit to be upgraded at the time of order placement. Note2: The unit that is targeted for the upgrade must be returned to Keysight using the standard RMA process through the Keysight Ixia Support organization as a Return and Repair RMA.

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