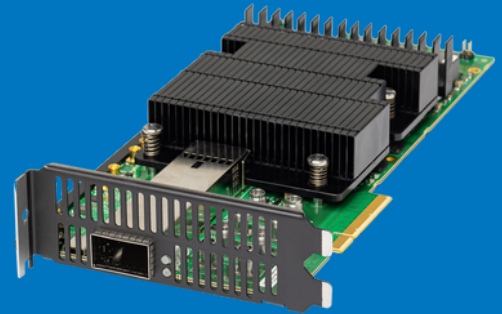


Z800o Freya

Ethernet traffic generator module supporting 800Gbps 112G PAM4 SerDes OSFP-800



Key Features

5-speeds: 800GE, 400GE, 200GE, 100GE & 50GE

Price/performance

Ease of use

Dual media: QSFP-DD800 & QSFP112

Supports 112G SerDes (PAM4 112G) & 56G SerDes (PAM4)

Test with optics and DAC's

Auto-Negotiation & Link Training (AN/LT)

Advanced Physical Layer testing

The Z800o Freya test modules support five different Ethernet network speeds - 800GE, 400GE, 200GE, 100GE and 50GE using 112G/56G SerDes (PAM4).

The module supports OSFP-compatible transceivers.

The Z800o Freya is a highly versatile solution for performance and functional testing of Ethernet network infrastructure and equipment including switches, routers and NICs.

Z800o Freya can test up to 800Gbps with 112G SerDes (PAM4 112G) to help you optimize signal integrity and improve Bit Error Rate performance.

Z800o Freya supports extensive L1 test features for advanced PCS and PMA layer testing including dynamic transceiver clock sweep, lane skewing and PRBS modes. Signals can be analyzed in advanced signal integrity view, which provides visual information on the quality of the signal.

The Z800o Freya test module supports Auto-Negotiation and Link Training (AN/LT) on 112G SerDes and 56G SerDes.

Z800o Freya modules can be installed in Xena B2400 for multi-module setup, or delivered in the XenaCompact chassis, making it the most compact and lightweight 800Gbps Ethernet test solution on the market.

Included with the Z800o Freya is XenaManager, the user-friendly multi-user management software for generating and analyzing traffic. Xena OpenAutomation (XOA) is also included to help you quickly and easily integrate Xena test equipment into scripting and automation platforms, and for doing tailored tests as well as standardized test methodologies.

Ethernet Auto-Negotiation & Link Training Test Tools

Z800o Freya customers can purchase a special Z800 Freya-ANLT license for enabling AN/LT Utility on Z800q Freya and Z800o Freya modules. This license enables additional AN/LT tools for thorough testing of the endpoint behavior during AN and LT process.

The AN/LT Utility provides insight, visibility, and configuration possibilities to the AN and LT process making it easy to analyze DUT behaviour during AN/LT, configure and optimize the relevant AN parameters and LT coefficients.

[**FIND OUT MORE HERE:**](#)



PORT LEVEL FEATURES	
Interface category	OSFP 800G, 400G, 200G, 100G, 50G Ethernet
Total number of test ports (software configurable)	1x800G, 2x400G, 4x200G, 8x100G and 50G Ethernet
Interface options	<div><div><div>OSFP cage</div><div>112G SerDes:</div><div>56G SerDes:</div></div><div><div><div>• 1 x 800GE</div><div>• 2 or 1 x 400GE</div><div>• 4 or 2 x 200GE</div><div>• 8 or 4 x 100GE</div></div><div><div>PAM4</div><div>PAM4</div><div>PAM4</div><div>PAM4</div></div></div><div><div>IEEE</div><div>802.3df (D2.0) / ETC* or</div><div>802.3ck or</div><div>802.3ck or</div><div>802.3ck</div></div></div> <div><div>Power capacity: 20W (B2400 XenaBay) / 25W (XenaCompact)</div><div>*ETC = Ethernet Technology Consortium</div></div>
Auto Negotiation and Link Training	<div><div>• Auto-negotiation: IEEE 802.3 Clause 73 and ETH. 400G/800G specifications</div><div>• Link training: IEEE 802.3 Clause 136 and 161</div></div>
Forward Error Correction (FEC)	<div><div>• RS-FEC (Reed-Solomon) (544,514,t=15), IEEE802.3 Clause 119</div><div>• RS-FEC (Reed-Solomon) (544,514,t=15), IEEE802.3 Clause 134</div></div>
Number of transceiver module cages	1 x OSFP
Port statistics	<div><div>• Link state, FCS errors, pauseframes, ARP/PING, error injections, training packet</div><div>• All traffic: RX and TX Mbit/s, packets/s, packets, bytes</div><div>• Traffic w/o test payload: RX and TX Mbit/s, packets/s, packets, bytes</div></div>
Adjustable Inter Frame Gap (IFG)	Configurable from 16 to 56 bytes, defaultis 20B (12BIFG + 8B preamble)
Transmit line rate adjustment	Ability to adjust the effective line rate by forcing idle gaps equivalent to -1000 ppm (increments of 10 ppm)
Transmit line clock adjustment	From -400 to 400 ppm in steps of 1 ppm (shared across all ports)
PPM Sweep	Configurable linear or step sweep +/- 400 ppm
ARP/PING	Supported (configurable IP and MAC address per port)

PORT LEVEL FEATURES	
Field upgradeable	System is fully field upgradeable to product releases (FPGA images and software)
Tx disable	Enable/disable of optical laser or copper link
IGMPv2 multicast join/leave	IGMPv2 continuous multicast join, with configurable repeat interval
Histogram statistics	Two real-time histograms per port. Each histogram can measure one of RX/TX packet length, IFG, or Latency distribution for all traffic, a specific stream, or a filter
Loopback modes	<ul style="list-style-type: none"> • L1RX2TX – RX-to-TX, transmit byte-by-byte copy of the incoming packet • TXON2RX – TX-to-RX, packet is also transmitted from the port • TXOFF2RX – TX-to-RX, port's transmitter is idle
Oscillator characteristics	<ul style="list-style-type: none"> • Initial Accuracy is 3 ppm • Frequency driftover 1st year: +/- 3 ppm (over 15 years: +/- 15 ppm) • Temperature Stability: +/- 20 ppm (Total Stability is +/- 35 ppm)

PCS/PMA LAYERS TESTING	
Payload Test pattern	PRBS-13 & PRBS-31
Alarms	PRBS pattern loss, link sync loss
Error analysis	Bit-errors: seconds, count, rate
PCS virtual lane configuration	User-defined skew insertion per Tx virtual lane, and user defined virtual lane to SerDes mapping for testing of the Rx PCS virtual lane re-order function
PCS virtual lane statistics	Relative virtual lane skew measurements (up to 2048 bits). Corrected Bit error, Pre-FEC BER
FEC Total statistics	Total corrected FEC symbols, Total uncorrected FEC symbols, Estimated Pre-FEC BER, Estimated Post-FEC BER, Pre-FEC Error Distribution Graph
Link Flap	Single short or repeatable link down events with ms precision
Error Injection (PMA Layer)	Repeatable error inject periods at PMA layer with ms precision

PHY/TRANSCEIVER ETHERNET TESTING	
Programmable Pattern Generator	<ul style="list-style-type: none"> Supported in ANLT mode Ethernet frames with FCS Traffic load: up to 100% Configurable Frame Size distribution and content Transmit and Receive Statistics

ADVANCED PHY FEATURES	
Equalization Controls	<p>Tx Transmit Equalization Controls</p> <ul style="list-style-type: none"> Pre-emphasis Attenuation Post-emphasis <p>Rx Receive Equalization Controls</p> <ul style="list-style-type: none"> Continuous Time Linear Equalizer
Signal Integrity Analysis	<ul style="list-style-type: none"> FEC error correction chart Advanced signal integrity view

TRANSMIT ENGINES	
Number of transmit streams per port	<p>256 (wire-speed)</p> <p>Each stream can generate millions of traffic flows using field modifiers</p>
Test payload insertion per stream	Wire-speed packet generation with time stamps, sequence numbers, and data integrity signature optionally inserted into each packet.
Stream statistics	TX Mbit/s, packets/s, packets, bytes, FCS error
Bandwidth profiles	Burst size and density can be specified. Uniform and bursty bandwidth profile streams can be interleaved
Field modifiers	24-bit header field modifiers with incremental, decremental, or random mode. Each modifier has configurable bit-mask, repetition, min, max, and step parameters. Eight 24-bit modifiers can be configured per stream
Packet length controls	Fixed, random, butterfly, and incrementing packet length distributions from 56 to 16k bytes
Packet payloads (basic)	Repeated user specified 1 to 18B pattern, an 8-bit incrementing pattern
Error generation	Undersize length (56 bytes min) and oversize length (12288 bytes max.) packet lengths, injection of sequence, disorder, payload integrity, and FCS errors

TRANSMIT ENGINES	
TX packet header support and RX auto decodes	Ethernet, Ethernet II, VLAN, ARP, IPv4, IPv6, UDP, TCP, LLC, SNAP, GTP, ICMP, RTP, RTCP, STP, MPLS, PBB, or fully specified by user
Packet scheduling modes	<ul style="list-style-type: none"> • Normal (stream interleaved mode) – standard scheduling mode, precise rates, minor variation in packet inter-frame gap. • Strict Uniform – new scheduling mode, with 100% uniform packet inter-frame gap, minor deviation from configured rates. • Sequential packet scheduling (sequential stream scheduling). Streams are scheduled continuously in sequential order, with configurable number of packets per stream. • Burst Packets in a stream are organized in bursts. Bursts from active streams form a burst group. The user specifies time from start of one burst group till start of next burst group.

RECEIVE ENGINE	
Number of traceable Rx streams per port	2016 (wire-speed)
Automatic detection of test payload for received packets	Real-time reporting of statistics and latency, loss, payload integrity, sequence error, and disorder error checking
Jitter measurement	<ul style="list-style-type: none"> • Jitter (Packet Delay Variation) measurements compliant to MEF10 standard with 1 ns accuracy • Jitter can be measured on up to 32 streams
Stream statistics	<ul style="list-style-type: none"> • RX Mbit/s, packets/s, packets, bytes. • Loss, payload integrity errors, sequence errors, disorder errors • Min latency, max latency, average latency • Min jitter, max jitter, average jitter
Latency measurements accuracy	±16 ns
Latency measurement resolution	1 ns (Latency measurements can calibrate and remove latency from transceiver modules)
Number of filters:	<ul style="list-style-type: none"> • 6 x 64-bit user-definable match-term patterns with mask, and offset • 6 x frame length comparator terms (longer, shorter) • 6 x user-defined filters expressed from AND/OR'ing of the match and length terms
Filter statistics	<ul style="list-style-type: none"> • Per filter: RX Mbit/s, packets/s, packets, bytes

CAPTURE	
Capture criteria	All traffic, stream, FCS errors, filtermatch, or traffic without test payloads
Capture limit per packet	16 – 12288 bytes
Wire-speed capture buffer per port	64 kB
Low speed capture buffer per port (10Mbit/s speed)	4096 packets (anysize)

HW SPECIFICATIONS	
Max. Power	TBA W
Weight	2.32 lbs (1.05 kg)
Environmental	<ul style="list-style-type: none">• Operating Temperature: 10 to 35° C• Storage Temperature: -40 to 70° C• Humidity: 8% to 90% non-condensing
Regulatory	<p>High-quality 112Gbps-capable electrical connectors are used on Freya modules for optimal signal integrity and performance. However, all connectors experience wear when inserted, resulting in decreased signal integrity over time. The specification below is the minimum number of insertions where optimal signal integrity is guaranteed:</p> <ul style="list-style-type: none">• Connector for OSFP: Minimum number of guaranteed insertions: 500 cycles
Notes	<ul style="list-style-type: none">• This module is only supported by the B2400 and the Xena Compact chassis• This module requires two slots in the B2400 chassis

Ordering Information

Product Description

- Z800oc Freya OSFP in compact 1U chassis with 800GE 112G PAM4 SerDes (1x800GE, 2x400GE, 4x200GE, 8x100GE, 8x 50GE)
- Z800o Freya OSFP test module with 800GE 112G PAM4 SerDes (1x800GE, 2x400GE, 4x200GE, 8x100GE, 8x 50GE)

Product Code

C-Freya-800G-4S-1P-OSFP

Freya-800G-4S-1P-OSFP



Local sales offices are located throughout the world.
Visit our website to find the most convenient location.
1-800-5-LeCroy • [teledynelecroy.com](https://www.teledynelecroy.com)



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