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Odin-1G-3S-6P-T1

1Gbps 6-port Automotive Ethernet test module

The Odin-1G-3S-6P-T1 is a 6-port 1 Gbps/100/10Mbps Ethernet test module designed for Automotive Ethernet test applications.

The module has native 1000BASE-T1, 100BASE-T1 and 10BASE-T1S interfaces. Based on Xena's advanced architecture, the Odin-1G-3S-6P-T1 is the obvious choice for testing Automotive Ethernet up to 1G at Layers 2-3.

There is also a TSN-enabled version which is equipped with a high precision oscillator. This is called the Odin-1G-3S-6P-T1-RJ45-TSN.

Both versions are available for Xena's 4U 12-slot ValkyrieBay chassis and our robust transportable 1U ValkyrieCompact chassis. They come complete with a full range of test software (as part of the Xena Value Pack*) which includes predefined test suites for RFC 2544, and comprehensive test automation options.

TOP FEATURES

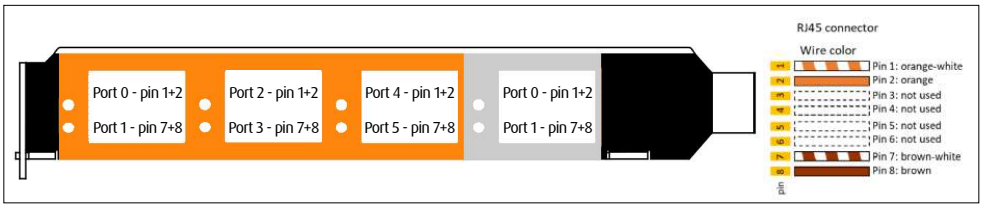
- Designed for testing Automotive Ethernet
- Native 1000BASE-T1, 100BASE-T1 and 10BASE-T1S interfaces
- A TSN-enabled version (called Odin-1G-3S-6P-RJ45-TSN) which has a high precision oscillator
- Choice of chassis
- Predefined test suites for RFC 2544
- Industry's best automation options

XENA VALUE PACK*

Included with Odin-1G-3S-6P-T1:

- User-friendly software (ValkyrieManager, Valkyrie3918, Valkyrie2544, Valkyrie1564 Valkyrie2889 and ValkyrieCLI,)
- Three years' free software updates
- Three years' free hardware warranty
- Free tech support & training for the product lifetime

RJ45 connector pin out:



PORT LEVEL FEATURES

Interface category	10/100/1000M Ethernet
Total number of test ports	6 x 100/1000M, 2 x 10M
Interface options	1000BASE-T1 or 100BASE-T1 or 10BASE-T1S
Number of physical interface form factor	6 x RJ45 (100/1000M), 2 x RJ45 (10M) - see graphic above
Port statistics (counter size: 64 bits)	• Link state, FCS errors, pause frames, ARP/PING, error injections, training packet • All traffic: RX and TX Mbit/s, packets/s, packets, bytes • Traffic w/o test payload: RX and TX Mbit/s, packets/s, packets, bytes
Adjustable Inter Frame Gap (IFG)	Configurable from 16 to 56 bytes, default is 20B (12B IFG + 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)
ARP/PING	Supported (configurable IP and MAC address per port)
Field upgradeable	System is fully field upgradeable to product releases (FPGA images and software)
Histogram statistics (counter size: 64 bits)	Two real-time histograms per port. Each histogram can measure one of RX/TX packet length, IFG, jitter, or latency distribution for all traffic, a specific stream, or a filter
Tx disable	Enable/disable of copper link
IGMPv2 multicast join/leave	IGMPv2 continuous multicast join, with configurable repeat interval
Oscillator characteristics	Odin-1G-3S-6P-T1-RJ45: • Initial Accuracy is 3 ppm • Frequency drift over 1st year: ± 3 ppm (over 15 years: ± 15 ppm) • Temperature Stability: ± 20 ppm (Total Stability is ± 35 ppm) Odin-1G-3S-6P-T1-RJ45-TSN: • Initial Tolerance: ± 500 ppb • One-year Aging: ± 35 ppb • Temperature Stability: ± 8 ppb • Total Stability – 20 years: ± 1 ppm • GR-1244 Stratum 3E compliant

TRANSMIT ENGINES

Number of transmit streams per port	256 (wire-speed) Each stream can generate millions of traffic flows through the use of field modifiers
Test payload insertion per stream	Wire-speed packet generation with timestamps, sequence numbers, and data integrity signature optionally inserted into each packet.
Stream statistics (counter size: 64 bits)	TX Mbit/s, packets/s, packets, bytes, FCS error, Pause
Bandwidth profiles	Burst size and density can be specified. Uniform and bursty bandwidth profile streams can be interleaved
Field modifiers	16-bit header field modifiers with inc, dec, or random mode. Each modifier has configurable bit-mask, repetition, min, max, and step parameters. 6 modifiers per stream
Packet length controls	Fixed, random, butterfly, and incrementing packet length distributions from 56 to 16384 bytes
Packet payloads	Repeated user specified 1 to 18B pattern, an 8-bit incrementing pattern
Error generation	Undersize length (56B min) and oversize length (16384 max.) packet lengths, injection of sequence, misorder, payload integrity, and FCS errors
TX packet header support and RX autodecodes	Ethernet, Ethernet II, VLAN, ARP, IPv4, IPv6, UDP, TCP, LLC, SNAP, GTP, ICMP, RTP, RTCP, STP, MPLS, PBB, or fully specified by user
Pause frames	Responds to incoming pause and PFC (Priority-based Flow Control) frames
Packet scheduling modes	• 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 misorder error checking
Jitter measurement	Jitter (Packet Delay Variation) measurements compliant to MEF10 standard with 8 ns accuracy Jitter can be measured on up to 32 streams
Stream statistics (counter size: 64 bits)	• RX Mbit/s, packets/s, packets, bytes. • Loss, payload integrity errors, sequence errors, misorder errors • Min latency, max latency, average latency • Min jitter, max jitter, average jitter
Latency measurements accuracy	±32 ns
Latency measurement resolution	8 ns *(Latency measurements can calibrate and remove latency from transceiver modules)*
Number of filters:	• 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 (counter size: 64 bits)	Per filter: RX Mbit/s, packets/s, packets, bytes.

CAPTURE 100/1000M Ethernet

Capture criteria	All traffic, stream, FCS errors, filter match, or traffic without test payloads
Capture start/stop triggers	Capture start and stop trigger: none, FCS error, filter match
Capture limit per packet	16 – 16384 bytes
Wire-speed capture buffer per port	16 kB
Low speed capture buffer per port (10Mbit/sec)	4096 packets (any size)

10M Ethernet – 10BASE-T1S Functionality

Functionality	To be defined

SPECIFICATIONS

Max. Power	• TBD W
Weight	• 0.33 lbs (0.15 kg)
Environmental	• Operating Temperature: 10 to 35° C • Storage Temperature: -40 to 70° C • Humidity: 8% to 90% non-condensing
Regulatory	• FCC (US), CE (Europe)

PRODUCT NUMBERS (P/N)

- Odin-1G-3S-6P-T1-RJ45 - test module for ValkyrieBay chassis (not included)
- C1-Odin-1G-3S-6P-T1-RJ45 - mounted in ValkyrieCompact chassis (included)
- Odin-1G-3S-6P-T1-RJ45-TSN - test module for ValkyrieBay chassis (not included)
- C1-Odin-1G-3S-6P-T1-RJ45-TSN - mounted in ValkyrieCompact chassis (included)

XENA™
Test. Improve. Repeat.