

Ixia UHD100T32 QSFP28 Ultra-High-Density 32-Port Test System



**UHD100T32 100GE
QSFP28 UHD 32-port
Test System**

Challenge: Testing 100GE at Scale

Even with link aggregation, 10 gigabit Ethernet (GE) and 40GE technologies fall short of meeting the scalability and cost per bit needed to support today's bandwidth-hungry networks. This has led to the adoption of 100GE across the entire networking eco-system. With mass deployment in modern data centers, 100GE technologies have now come to maturity and market trends indicate steady growth for the next few years.

To address the need for higher scale at a manageable cost, merchant silicon is significantly driving down the cost per bit of switched data in the network. Cost-prohibitive test gear leads to compromise in testing cycles and even the use of home-grown, immature, and inadequate test systems and methodologies.

Solution: Cost Effective, High Density Test System

Keysight now offers the Ixia **UHD100T32**, the industry's first test solution purpose-built to address the density challenges of validating 100GE devices and networks in a more cost-effective way. In just a 1U form-factor, the fixed chassis provides 32 QSFP28 100GE ports, ready for use cases ranging from white box production-line testing to data center pre- and post-deployment testing.

Supporting 100/50/40/25/10GE speeds, the **UHD100T32** system comes with all fanouts enabled. It also includes Keysight's proven technology for Layer 2/3 traffic generation and analysis. Optional routing protocols are available that include OSPF, BGP, and ISIS and RFC 2544 benchmark test capabilities.



Highlights

- Speed time to test with easy-to-deploy out-of-the-box solution
- Simplified web application to run end-to-end test
- Reduce CapEx with new full-solution subscription model
- Use less rack space and power with compact, data-center-ready footprint
- Validate high-port-count devices for performance, scalability, and interoperability
- Pay as you grow with subscription option
- Deploy in lab or production environments
- Modernize automated testing with REST API

Key Features

- Line-rate 3.2Tbps packet generation and analysis of received traffic to detect and debug data transmission errors for multiple speeds, including 32x100GE, 64x50GE, 32x40GE, 128x25GE, 128x10GE
- UHD base software with IPv4/IPv6/Ethernet interface emulation, line-rate traffic and RFC 2544 benchmark test
- Line-rate, at all speeds with per-port and per-flow statistics
- Latency measurement with 1ns resolution
- Reed-Solomon forward error correction (RS-FEC) and fire-code FEC (FC-FEC) support with FEC statistics
- Auto-negotiation and link training support
- Routing protocols (BGP, OSPF, ISIS) support for 10 sessions (add-on option)
- Supports RFC benchmarking of networking devices and equipment using industry-standard RFC 2544 benchmark tests at line-rate 100/50/40/25/10GE speeds
- Automate testing with REST API Browser and RESTpy support
- Measure throughput, latency, packets loss, and convergence times
- Faster time to test with no client application to install and inherent session sharing capability: Web-based UI enables user to point a web browser to the IP address of the box

Specifications

Key Specifications	UHD100T32 Perpetual	UHD100T32 Base Subscription	UHD100T32 Standard Subscription
Part Number	944-1180	U100-BASE	U100-STANDARD
Hardware Fixed Chassis System Specifications			
RU / Number of Ports	1 RU 32-port fixed chassis systems		
Physical Interfaces	Native QSFP28 physical port		
Supported Port Speeds	<ul style="list-style-type: none"> • 100GE/port: 100GE-capable fiber and passive copper cable media • 2x50GE/port: 50GE-capable passive copper (DAC) for point-point and fan-out cables, and multimode fiber point-to-point AOC media • 40GE/port: 40GE-capable passive copper (DAC) for point-point and fan-out cables, and multimode fiber point-to-point AOC media • 4x25GE/port: 25GE-capable fiber and passive copper point-point and fan-out cable media • 4x10GE/port: 10GE-capable fiber and passive copper point-point and fan-out cable media 		
CPU and Memory	Multicore processor with 4GB of CPU memory per resource group		

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IEEE Interface Protocols for 100GE	<ul style="list-style-type: none"> • IEEE 802.3 100GBASE-R LAN • IEEE P802.3bj • IEEE P802.3bm • IEEE P802.3by • IEEE 802.3ba • IEEE 802.3ae 		
Layer 1 Support	<p>100GE:</p> <ul style="list-style-type: none"> • Auto-negotiation (AN), Clause 73 for passive copper DAC • Link training for 100GE copper cable media, Clause 73 • Ethernet Forward Error Correction RS-FEC, Clause 91 <ul style="list-style-type: none"> – FEC statistics: FEC Corrected and Uncorrected Codeword Counts • Ability to independently turn ON or OFF AN with Link training or FEC, or to allow IEEE defaults to automatically manage the interoperability or FEC, or to allow IEEE defaults to automatically manage the interoperability <p>50GE:</p> <ul style="list-style-type: none"> • Ethernet Forward Error Correction: <ul style="list-style-type: none"> – FC-FEC, Clause 74 for BASE-R PHYs – RS-FEC, Clause 91 for 50GBASE-R PHYs • FEC statistics: <ul style="list-style-type: none"> – FEC Corrected and Uncorrected Codeword Counts • Independent fan-out ports with physical fan-out media for up to 2×50GE per QSFP28 port <p>40GE:</p> <ul style="list-style-type: none"> • Auto-negotiation (AN), Clause 73 for passive copper DAC • Link training for copper cable media, Clause 73 <p>25GE:</p> <ul style="list-style-type: none"> • Auto-negotiation (AN), Clause 73 for passive copper DAC. • Link Training (LT) for 25GE copper DAC media (Clause 93, 110) Note: Clause 72 link training patterns are not supported • Ethernet Forward Error Correction: <ul style="list-style-type: none"> – FC-FEC, Clause 74 for BASE-R PHYs – RS-FEC, Clause 108 for 25GBASE-R PHYs • FEC statistics: <ul style="list-style-type: none"> – FEC Corrected and Uncorrected Codeword Counts • Ability to independently turn ON or OFF AN with Link training, or FEC, or to allow IEEE defaults to automatically manage the interoperability • Independent fan-out ports with physical fan-out media for up to 4×25GE per QSFP28 port <p>10GE:</p> <ul style="list-style-type: none"> • Independent fan-out ports with physical fan-out media for up to 4×10GE per port 		

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Transceiver Support	<ul style="list-style-type: none"> • 100GBASE-SR4 and 4x25GBASE-SR QSFP28 for multimode fiber <ul style="list-style-type: none"> – Pluggable transceiver – 100GE speed support requires a point-to-point cable – 40GE speed support requires a point-to-point cable – 25GE speed support requires a point-to-point cable or a fan-out cable – 10GE speed support requires a point-to-point cable or a fan-out cable • 100GBASE-LR4 QSFP28 for single-mode fiber <ul style="list-style-type: none"> – Pluggable transceiver – 40GE speed not compatible with 100GBASE-LR4 QSFP28. Must use 40GBASE-LR4 QSFP transceiver for 40GE speed • 100G PSM4 QSFP28 for single mode fiber <ul style="list-style-type: none"> – Pluggable transceiver – 100GE support requires a point-to-point cable – 25GE support requires a point-to-point or a fan-out cable 		
Cable Media	<ul style="list-style-type: none"> • 100GBASE-SR4 multimode fiber Active Optical Cable (AOC) and MT-MT 12-fiber point-to-point cables for QSFP28 • 100GBASE-CR4, passive, copper Direct Attached Cable (DAC) up to 5 meters in length; note: requires RS-FEC to be enabled • 50GBASE-CR2 passive, copper Direct Attached Cable (DAC) QSFP28-to-2xQSFP28 fan-out media, up to 3 meters in length; note: requires BASE-R FEC Clause 74 or RS-FEC Clause 91 to be enabled • 50GBASE-SR2 multimode fiber Active Optical Cable (AOC) media, 850nm, 3-meter length • 25GBASE-SR multimode fiber Optical Cable (AOC) and MT-MT 12-fiber point-to-point cable for QSFP28, 3-meter length is available • 25GBASE-SR multimode fiber MT-to-4xLC fan-out cable for QSFP28, 3-meter and 5-meter lengths are available • 25GBASE-LR single mode fiber MT-to-4xLC fan-out cable for QSFP28, 3-meter length is available • 25GBASE-CR passive, copper Direct Attached Cable (DAC) point-point, up to 5 meters in length; note: requires BASE-R FEC Clause 74 or RS-FEC Clause 91 to be enabled • 25GBASE-CR passive, copper Direct Attached Cable (DAC) QSFP28-to-4xSFP28 fan-out media, up to 5 meters in length; note: requires BASE-R FEC Clause 74 or RS-FEC Clause 91 to be enabled 		
Fixed Chassis Dimensions	509 x 440 x 44 mm (20.03 x 17.32 x 1.73)		
Fixed Chassis System Weights	<ul style="list-style-type: none"> • Hardware only: 20.05 lbs. (10.00 kg) • Shipping: 25lbs. (11.33 kg) - Approximate (includes rackmount slides, power cords, sync cables & packaging) 		
Fixed Chassis System Electrical Power	<ul style="list-style-type: none"> • 2 redundant, load-sharing hot-swappable AC, 1100W • 90 to 240 VAC at 50-60 Hz 		

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Fan	Hot-swappable fans with N+1 redundancy		
Temperature	<ul style="list-style-type: none"> Operating: 0C to 40C (32F to 104F) Storage: -40C to 70C (-40F to 158F) 		
Humidity	0%-95% non-condensing		
Regulatory Compliance Specifications	IEC/EN/UL/CSA 60950-1, IEC/EN/UL/CSA 62368-1, CE (LVD, EMC, RoHS), EN/IEC 55032, EN/IEC 55024, CFR 47, FCC Part 15B, ICES-003, AS/NZ CISPR 32/24, KN32/35, Korea (KCC), Customs Union (EAC)		
Transmit Feature Specifications			
Transmit Engine	Wire-speed packet generation with timestamps, sequence numbers and packet group signatures		
Max. Streams per Port and Speed	100GE: 16 50GE: 8 40GE: 16 25GE: 4 10GE: 4	100GE: 1 50GE: 1 40GE: 1 25GE: 1 10GE: 1	100GE: 16 50GE: 8 40GE: 16 25GE: 4 10GE: 4
Stream Controls	<ul style="list-style-type: none"> Rate and frame size change on the fly Advanced stream scheduler support 		
Minimum Frame Size	<ul style="list-style-type: none"> 200 bytes at full line rate 64 bytes at full line rate on a subset of ports 	200 bytes at full line rate	<ul style="list-style-type: none"> 200 bytes at full line rate 64 bytes at full line rate on a subset of ports
Maximum Frame Size	9,216 bytes		
Frame Length Controls	Fixed, IMIX, Custom IMIX	Fixed	Fixed, IMIX, Custom IMIX
Value Lists (Max.) per port	1024/100GE port 512/50GE port 1024/40GE port 256/25GE port 256/10GE port	100/100GE port 100/50GE port 100/40GE port 100/25GE port 100/10GE port	1024/100GE port 512/50GE port 1024/40GE port 256/25GE port 256/10GE port
Hardware Checksum Generation	Checksum generation and verification for IPv4, TCP/UDP		

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Link Fault Signaling	Reports, no fault, remote fault, and local fault port statistics		
Latency Measurement Resolution	1 nanosecond		
Intrinsic Latency Compensation	Removes inherent latency error from the 100GE port electronics		
Receive Feature Specifications			
Receive Engine	Wire-speed real-time latency and sequence checking capability		
Trackable Receive Flows per Port (Max)	100GE: 1,024 50GE: 512 40GE: 1,024 25GE: 256 10GE: 256	100GE: 16 50GE: 8 40GE: 16 25GE: 8 10GE: 8	100GE: 256 50GE: 128 40GE: 256 25GE: 64 10GE: 64
Minimum Frame Size	<ul style="list-style-type: none"> • 200 bytes at full line rate • 64 bytes at full line rate on a subset of ports 		
Standard Statistics and Rates	Link state, line speed, frames sent, valid frames received, bytes sent/received, fragments, undersize, oversize, CRC errors, sequence checking frames, sequence checking errors, ARP, and PING requests and replies		
FEC Statistics	<p>The below FEC statistics are available as applicable to different speed modes:</p> <ul style="list-style-type: none"> • RS-FEC Corrected Codeword Count • RS-FEC Uncorrected Codeword Count • FC-FEC Corrected Block Count • FC-FEC Uncorrected Block Count • Fire code FEC Sync • RS-FEC Corrected Codeword Count Rate • RS-FEC Uncorrected Codeword Count Rate • FC-FEC Corrected Block Count Rate • FC-FEC Uncorrected Block Count Rate 		
Latency / Jitter Measurements	Store & forward		
Layer 2-3 Protocol Support			
Routing, Switching	IPv4/IPv6,BGP4/BGP4+, OSPFv2/v3, ISISv4/v6	IPv4/IPv6	IPv4/IPv6,BGP4/BGP4+, OSPFv2/v3, ISISv4/v6

Application Support

UHD100T32

UHD Web Application: Line-rate traffic generation with service modeling that builds realistic, dynamically controllable data-plane traffic. Industry's best test solution for functional and performance testing by using comprehensive emulation for routing, switching end points

UHD Web Quick Test and Traffic Test Application: RFC 2544 based benchmark tests*

*Not available in U100-BASE subscription

REST API/ RESTpy: Comprehensive automation coverage through Keysight's cutting edge REST API and pythonic wrapper APIs RESTpy

UHD Application Software Part Numbers for Perpetual (944-1180)

930-2230

IXIA Basic package for UHD100T32; INCLUDES: RFC2544 QuickTest

930-2231

IXIA Basic Routing bundle for UHD100T32, Includes BGP4/BGP4+, OSPFv2/v3, ISISv4/v6, Requires

930-2230: Basic package for UHD100T32

Notes: 930-2230 is in the bill of materials for 944-1180 and is not required to be ordered separately. All subscription part number (U100*) is inclusive of hardware and software.

Contact your Keysight sales representative for ordering information.

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