DTA-100E/F
40G/100G Ethernet/OTN Analyser

The DTA-100E/F is designed for satisfying the current increasingly test demand of Core Network and MAN 100GE/40GE and OTU4/OTU3E1/OTU3E2/OTU3 such high speed network performance and stability.

◆ CFP interface for 100GE and OTU4 Applications;

◆ QSFP28 interface support with QSFP28 and CFP-to-QSFP28 Adapters;

◆ QSFP28/QSFP+ interface for 40GE and OTU3E1/OTU3E2/OTU3 Applications;

◆ External clock interface;

◆ 200ppm clock offset generation;

◆ Eye diagram reference clock output；

◆ Soft LED indicator.

Platform

➢ Compact and Lightweight designed, high portable
➢ Powerful modular intelligent network test platform
➢ Graphical user interface, easy to use
➢ Dial, number keys and function keys for flexible scrolling and selecting.
➢ 6.5inches outdoor-enhanced LCD color touch screen
➢ Fast and efficient test result transfer to USB memory stick
➢ Remote control by PC using 10/100M Base-T port

Key Feature

Ethernet Test

- Optical 100G/40G Ethernet testing;

- Optical Lane BERT and CAUI-4/XLAUI Lane BERT;

- PCS Layer Testing with Skew generation and monitoring;

- Multi-stream testing up to 512 independent streams;

- RFC2544 and Y.1564 SLA testing;

- Service Disruption Measurements;

- IPv4 and IPv6 traffic generations;

- BERT, loopback testing at Layer1 to Layer4;

- Q in Q, MPLS, MPLS-TP support;

- Error Injection and Alarm Generation.

- 100G/40G packet capture with Shinewaytech Capture Software decode;

OTN Test

- OTN testing for OTU4/OTU3E1/OTU3E2/OTU3;

- Complete multi-stage Mapping/Multiplexing;

- Ethernet over OTN;

- Service Disruption Measurements;

- Overhead monitoring and byte decoding;

- Terminate and Through test modes;

- Per-lane optical power and wavelength measurements;

- External clock reference interface;

- Eye diagram reference interface;

- Error Injection and Alarm Generation.

Transceiver Test

- Optical Lane BERT;

- PCS lager testing with skew generation and monitoring;

- Transmit and receive optical power measurement;

- Module status display.

Applications

➢ OTN Core Network, MAN development, installation, and maintenance;

➢ Carrier Ethernet infrastructure manufacture, installation, and maintenance;

➢ Mobile Front haul and Backhaul Network installation, and test;

➢ BERT, RFC2544, and SLA verification;

➢ 100G/40G data stream generation and analysis.

General Specifications

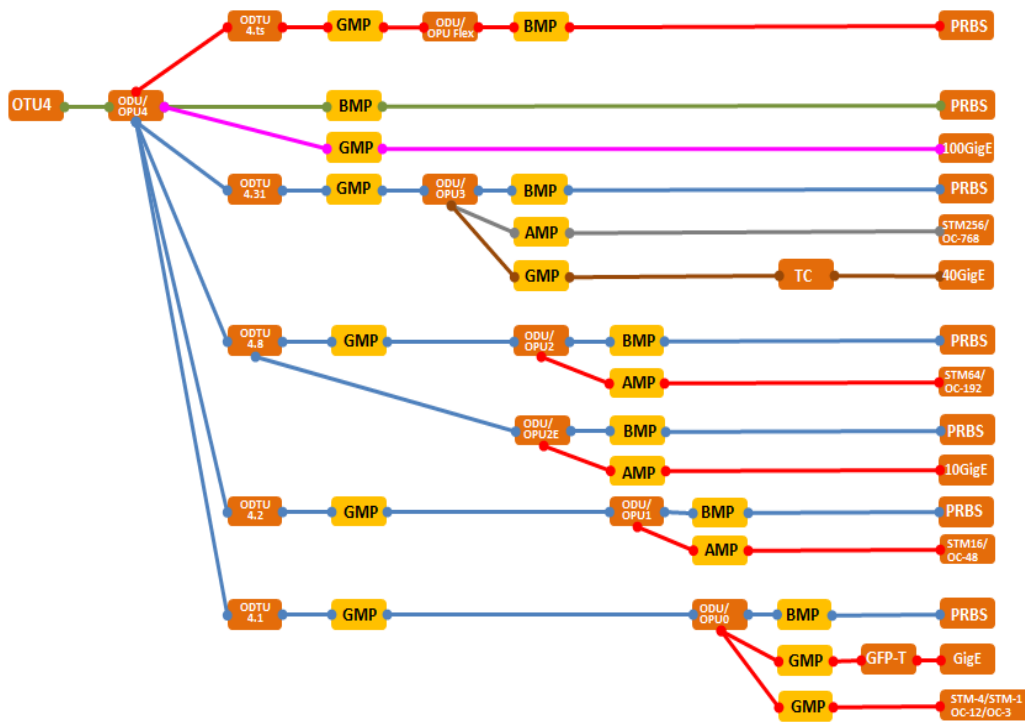| User Interface	
Screen	6.5 Inch TFT Touch Screen (640 x 480);
Other Interface	
USB	USB2.0, A type, 2; USB2.0 Mini B type, 1;
Ethernet	Ethernet 10/100, RJ45;
Audio	3.5mm Audio Interface;

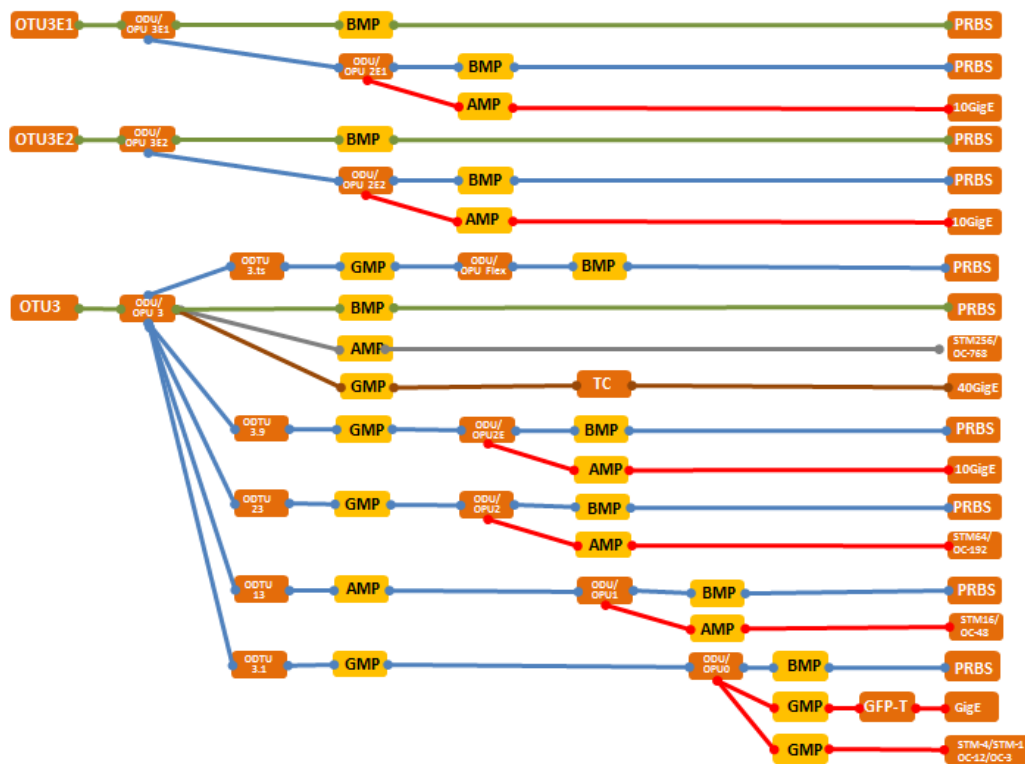| Storage	16G;
Physical Specifications	
Temperature	Operating: -10°C to 50°C; Storage: -40°C to 70°C;
Relative Humidity	0% to 95%(non-condensing);
Size(H×W×D)	Platform: 319mm x 202mm x 105mm; Module:25mm x 97mm x 259mm;
Weight	Platform: 2.8kg; Module: 1.2kg;
Vibrancy	10Hz to 500Hz < 1.5g (on 3 main axes);
Mechanical Shock	6 sides, 8 edges < 760cm, according to GR-196-CORE;
EMC	EN55022/CIPSR22; EN61000-3-2; EN55024;
Battery and Power Supply	
Battery	Rechargeable Li-Ion batteries; Working time: 4 hours (typical for 10G Ethernet test); Charging time: 3.5hours (typical: 25°C);
Power Source	Input: 100-240VAC, 50-60Hz,2A; Output: 19VDC, 4A.

Technical Specifications

OTN

OTU4/OTU3/OTU3E1/OTU3E2	
Interface	OTU4 optical interface: CFP, 1 port.
Frame	• In accordance with ITU-T G.709; • FEC: In accordance with G.709, RS (255,239), enable to control.
Extern Clock	• Termination: 50Ω; • Connector: SMA.
Operator Mode	• Pointer-to-pointer mode; • Through mode.
Framing	ITU-T G.709.
Receive Single Rate	• ±200ppm; • Frequency deviation indication resolution: ±0.1ppm.
TCM Frame Format	• ITU-T G.783, G.707 Annex D and Annex E, POH bytes: • HP-N1 *(SDH)*, • LP-N1 *(SDH)*, • LP-N2 *(SDH)*, • Z5*(SONET)*, • Z6 *(SONET)*; • TCM access point identifier (Apid): 15 bytes ASCII sequence, CRC-7.
Transmitter Clock	• Internal clock: 4.6ppm ±200ppm (0.1ppm step); • Received signal clock; • External clock: 2.048MHz, 2.048Mbps, 1.544Mbp.
Scrambling	ITU-T G.709 and G.sup43

OTN Mapping:OTU4

OTN Mapping:OTU3/OTU3E1/OTU3E2

OTU4/OTU3/OTU3E1/OTU3E2 Test		
OTN Alarm	**Alarm can be detected:** • OUT: OTU-AIS, LOF, OOF, LOM, OOM, SM-TIM, SM-BIAE, SM-BDI, SM-IAE; • ODU: ODU-AIS, ODU-OCI, ODU-LCK, PM-TIM, PM-BDI; • ODU Multiplex: ODU-LOF, ODU-OOF, ODU-LOM, ODU-OOM; • OPU: PLM, OPU-MSIM,CSF, LSS; • TCM: TCMi-TIM, TCMi-BIAE, TCMi-BDI, TCMi-IAE (i=1-6); • OTL: LOF, OOF, OOR, LOR, OOM, LOM, ILA/OLA. **Alarm can be generated:** • OUT: OTU-AIS, LOF, OOF, LOM, OOM, SM-TIM, SM-BIAE, SM-BDI, SM-IAE; • ODU: ODU-AIS, ODU-OCI, ODU-LCK, PM-TIM, PM-BDI; • ODU multiplex: ODU-LOF, ODU-OOF, ODU-LOM, ODU-OOM; • OPU: LSS, CSF; • TCM: TCMi-TIM, TCMi-BIAE, TCMi-BDI, TCMi-IAE (i=1-6); • OTL: LOF, OOF, OOR, LOR.	
OTN Error	**Error can be detected:** • OUT: FAS, MFAS, SM-BEI, SM-BIP8, FEC-Correctable, FEC-Uncorrectable; • ODU: PM-BIP8, PM-BEI;	• OPU: BIT; • TCM: TCMi-BEI, TCMi-BIP8 (i=1-6); • OTL: FAS, MFAS, LLM.
	Error can be generated: • OUT: FAS, MFAS, SM-BEI, SM-BIP8; • ODU: PM-BIP8, PM-BEI, ODU-FAS; • OPU: BIT;	• TCM: TCMi-BEI, TCMi-BIP8 (i=1-6); • OTL: FAS, MFAS, LLM.
Mapping Adjustment	• Adjustment: (each AMP) -1/+1/+2; • Cm (t) (each GMP): based on Cm (t) (ppm).	
BERT Pattern	**Support to generate and detect:** • PRBS9, PRBS11, PRBS15, PRBS20, PRBS23, PRBS31. **Support reversed PRBS pattern:** • 16 bit user define pattern.	
FEC	ITU-T O.182.	
Overhead	**Overhead can be edited:** • OTU: FAS, SM-TTI, SM-BEI/BIDE, BDI, IAE,GCC0, RES; • ODU: PM-TTI, PM-BEI, BDI, IAE, FTFL, APS/PCC, GCC1, GCC2, RES, EXP, advanced TCMi-TTI (i=1-6), TCMi-BEI/BIAE, TCMi-BDI, TCMi-IAE, TCMi-RES (i=1-6); • OPU: PSI. **Decode:** • Advanced TTI (SM, PM, TCMi (i=1-6)), FTFL, PT. **Support to capture and display current overhead;** **Support to capture 256 continuous frames overhead bits.**	
Through	• Though mode; • Overhead rewrite mode; • Enable/disable FEC encoding and decoding.	
OTU4/OTU3/OTU3E1/OTU3E2 Result		
Situation	**Display information of current situation:**	
	• Alarms and errors; • Input power of optical signal;	• Frequency ; • Frequency deviation.
Statistics	Log: alarm (s), error (quantity/ratio).	

OTU4/OTU3/OTU3E1/OTU3E2 Result	
APS	**APS(Automatic protection switching):** • APS time; • Independently select start and complete trigger; • Select trigger from advanced OUT to ODU; • Display and save APS time, frequency, pass/fail, min/max/avg value. **APS time resolution: 0.1ms.**
Loop delay	• Resolution: 0.1us; • Maximum: 10.0 s.

Ethernet

100G/40G Ethernet					
Interface	CFP to QSFP28,100GE, one; CFP to QSFP+,40GE, one				
Configuration	Monitoring, generation, though mode				
Encapsulation	Ethernet type II, IEEE802.3 with 802.2,IEEE802.3 with SNAP				
Configuration, Monitoring, and Generation					
Stream Generation	**Stream quantity and speed:** • 512 stream generation and analysis in maximum; • Flexible data transmissions speed till reach the maximum line speed. **Stream sustained time mode:**				
	• Continuous;	• Burst;	• Ramp;	• N-frame;	• N-burst; • N-ramp;
	Frame size:				
	• Fixed; • Increased;	• Decreased; • Random;		• From 64 to 16,000 bits.	
	IP: • Fixed IP identifier; • IPV4 and IVP6 address configuration for source and destination; • Address increment, Decrement and Random generation supported. **TCP/UDP address is able to be edited;** **Support PAUSE frame generation and response;** **User-defined traffic mix of unicast and broadcast frames.**				
Stacked VLAN	**Support 3 layers VLAN, and VLAN tags parameters:** • Ethernet Type II 0x8100 (802.1Q), 0x88a8 (802.1ad), 0x9100, 0x9200, 0x9300; • User defined VLAN ID, CFI, and VLAN priority; • Address increment, Decrement and Random generation supported *(Coming soon)*.				
Clock	**Clock sources:**				
	• Internal; • Received clock; • 2.048 MHz, 2.048 Mbps, 1.544 MHz, 1.544 Mbps;		• Deviation: ±200 ppm (0.1-ppm steps); • The frequency deviation of received Ethernet signals can be measured against the internal clock.		
Error	• FCS;	• IP/UDP/TCP check sum;	• CRC4 error;		• Sequence error.
	100Gbps:				
	• Invalid block type; • Invalid synchronisation code;		• Invalid alignment flag; • BIP error.		
Alarm	• No link;	• Remote fault;	• Local fault;		• High BER.
PCS Deviation	• 100Gbp insert: 0-4096bits (TX channel); • Examine: relative deviation, marking mapping.				
Status	• Link status;		• MPLS/EoMPLS/VLAN;		• Speed of connecting port;

	• Interface type; • Jabber detected; • Frames	• Speed; • Signal; • Bit rate;	• Indicators for utilisation, throughput and errored frames.

Configuration, Monitoring, and Generation			
Performance Statistics	• Utilisation;	• Throughput;	• Frame rate.
Frame Statistics	• Total frames; • Total valid frames; • Unicast/Multicast/Broadcast frames; • Number of pause frames; • Number of VLAN frames;		• Number of MPLS frames; • Total errored frames; • Number of oversized and undersized (runts) frames; • Number of FCS errored frames.

Frame Distribution Statistics	**Total valid/ frames:**			
	• <64; • 64 to 127;	• 128 to 255; • 256 to 511;	• 512 to 1023; • 1024 to 1518;	• >1518.

Stream Statistics	**Information for each stream:**		
	• Frame loss count/rate; • Throughput;	• Latency; • Packet jitter;	• Frames and bytes received and transmitted.

Transmission Statistics	• Total frames;	• Unicast/multicast/broadcast frames.

Filter	**Filter conditions:**	
	• IP or MAC source address; • IP or MAC destination address; • Broadcast address; • Encapsulation type;	• VLAN ID and VLAN tag priority; • MPLS; • TPC/UDP source and destination port.

BERT and Service Disruption Measurement			
BERT	**BERT:** • Generation and detection of test patterns; • Count of errors in received test pattern. **Pattern generation:** • Layer 1 to layer 4; **Frame loss count and frame loss ratio;** **Throughput measurement results display;** **Test patterns:**			

	• PRBS 9; • PRBS 11; • PRBS 15;	• PRBS 31; • HF test pattern; • CRPAT;	• PRBS 20; • PRBS 23; • JTPAT;	• SPAT; • User defined (32bits).

Error	• FCS; • IP/UDP/TCP check sum;	• CRC4 error; • Sequence error.
Alarm	No link, and Remote fault.	
Service Disruption	**Service disruption measurement activated as part of BER test:** • Max/avg service disruption time, resolution: 0.1 µs; • Number of service disruptions.	

RFC2544			
RFC2544	**Switch/Router test and single ended network test modes:**			
	• Throughput;	• Frame loss;	• Latency;	• Back-to-back.
Service Activation Test	**ITU-T Y.1564 service activation test:** • Up to 512 services per port; • Colour-aware and non-colour-aware in combinations.			

Y.1564 (Service Activation Test)				
Service Activation Test	**Test modes:**			
	• One-way (uni- or bi-directional);		• Round-trip.	
	Verification against service acceptance criteria:			
	• CIR;	• EIR;	• Frame transfer delay;	• Frame delay variation;	• Frame loss rate.

Y.1564 (Service Activation Test)

Service Configuration Test	**Subtests for:**		
	• CIR;	• EIR;	• Traffic policing.
	Step duration:		
	• 1 s to 60 s (user programmable).		
	Results:		
	• Pass/fail indication; • IR (min/avg/max);	• FL (count/FLR); • FTD;	• FDV (min/avg/max (during measurement)).
Service Performance Test	**All services tested simultaneously at CIR;** **Duration:**		
	• 15 min;	• 2 h;	• 24 h;	• User defined.
	Results:		
	• Pass/fail indication; • IR (min/avg/max);	• FL (count/FLR); • FTD;	• FDV (min/avg/max (during measurement)).

Advanced IP Test Tools IP

PING	**For connectivity and configuration check:**	
	• Round trip time (RTT);	• Supports IPv4 address/TTL/URL.
Trace Route	**Trace IP route over IP network;** **Information per hop:**	
	• Ping time;	• Number of ping timeouts.
FTP Upload/ Download	**Simulation for FTP server and client test:**	
	• IPV4; • User name and password;	• File upload/download.
	Result:	
	• Pass/fail;	• Time display for upload/download.
HTTP	• IPV4;	• WEB display or not.
Online Scan	• MAC; • IP;	• VLAN ID; • MPLS label;	• Port.

MPLS

Number of MPLS Header	Up to 3 MPLS headers set by user.		
Parameters	**User defined in each MPLS header:**		
	• Label; • Exp;	• TTL fields;	• Address increment, decrement and random generation *(Coming soon)*.
Statistics	Number of MPLS-TP frames		

Ethernet Frame Capture

Capture Buffer Size	32Kbytes, When capture buffer full: stop.	
Capture Frame Slicing	Can capture frame length by user defined.	
Capture Data	CAP format for display in Wireshark.	
Area to be edited	• B-label; • I-label;	• MAC source address; • MAC destination address.

Ordering Information

Module		Description
Plaform		Test platform, support SDH, OTN, Ethernet, packet Ethernet, OTDR test modules;
Module	100G Ethernet	100GE and OTU4 test module;
		One 100Gige Interface;
		Layer 1 to Layer 4 BERT test;
		Up to 16 streams generation and analysis with MAC/VLAN/IP/TCP/UDP;
		RFC2544 standard test with Throughput, Latency, Frame Loss, Back-to-Back and Jitter;
		Layer 1 to Layer 4 loopback and smart loopback test;
		Enable to drop data packet under loopback mode;
		Up to 100G streams generation with 3 Layer VLAN;
		Ping, Trace Route, FTP Download/Upload, and HTTP tools;
		Ethernet service disruption test;
		Packet capture and analysis to 100G rate;
		Bi-directional test
		CFP check and PCS test
		Layer 1 bandwidth statistics
		Remote control by PC
	OTN	One OTU4 test port;
		OTN overhead edit and monitoring;
		OTN Alarm generation and monitoring, error injection and monitoring;
		FEC test according with ITU-T O.182;
		APS and SDT test;
		100GE mapping over OTU4 test;
		Round trip delay test;
		CFP check and PCS test;
		Remote control by PC;
Accessories Code		Accessories Description
16080010		LC/PC to LC/PC full-duplex single-mode fibre, 3m, one;
16120080		SMA test cables, two;
14020560		1310nm-100G-10km SM-LC-QSFP28-LR4-DDM (with CFP to QSFP28 Adapter), one;
14020570		1310nm-40G-10km SM-LC-QSFP+ LR4 DDM (If select 40G Ethernet or OTN test function, this module will be selected), one;
16060010		3 pins adapter cable, one;
43170020		100-240V input and 19V output AC/DC power adapter, one;
18080010		User manual and remote control software, one;
19070060		Package, one;
18010010		Factory test report, one;
18010020		Calibration certificate, one;
18040011		One year warranty service.

Optional Ethernet Information	
OPAP-Y1564100GeEth	Y.1564 standard service configuration and performance test for SLA QoS with CIR/EIR/Traffic Dropped;

OPAP-IPv6100GeEth	IPv6 feature, the test interface can set IPv6 address and also can generate stream with IPv6;
OPAP-Scan100GeEth	Traffic scan according with destination MAC/IP, source MAC/IP, 3 Layer VLAN, 3 Layer MPLS in-service test;
OAPA-EPING100GeEth	Advance/Fast PING, PING segments of the IP one by one in one time;
OPAP-3MPLS100GeEth	Up to 100G rates generation with 3 Layer MPLS label;
OPAP-128Streams100GeEth	Up to 128 streams generation and analysis with MAC/VLAN/IP/TCP/UDP for 100G port;
OPAP-512Streams100GeEth	Up to 512 streams generation and analysis with MAC/VLAN/IP/TCP/UDP for 100G port;
OPAP-DPRFC2544100GeEth	Enhancement RFC2544 test, support different upstream and downstream rates setup for Throughput, Frame Loss and Back-to- Back test;
OPAP-BaseA40GeEth	One 40Gige Interface (Open the 40G Ethernet test function)

Optional OTN Information

OPAP-OHSeqCapture	256 frames OTN overhead capture and decode capability
OPAP-ODU0Mapping	G.709 ODU0 mapping test features
OPAP-ODUflexMapping	G.709 ODUflex mapping test features
OPAP-ODU1Mapping	G.709 ODU1 mapping test features
OPAP-ODU2and2eMapping	G.709 ODU2 and ODU2e mapping test features
OPAP-ODU3Mapping	G.709 ODU3 mapping test features
OPAP-RFC2544atETHPayload	GE/10GE/40GE/100GE mapping into OTU3/OTU3e1/OTU3e2/OTU4, the ethernet payload can do RFC2544 testing.
OPAP-BaseA40GOTN	One OTU3 test port (Open the 40G OTN test function)
OPAP-OTU3E	OTU3E1/OTU3E2 test port (when select OTU3E, must select OTU3)

Optional Hardware

43160031	Lithium polymer rechargeable battery;
OPAP-One warranty	One year extended warranty service;
OPAP-Two warranty	Two years extended warranty service.

* Specifications subject to change without notice.