OTM2620

100G Ethernet/OTN Test Module

OTM2620 100G Test Module is a new modular product, which is released by OPWILL in 2015. This module is designed for satisfying the current increasingly test demand of Core Network and MAN 100GE and OTU4 such high speed network performance and stability.

This module is compatible with OTP6200v2 (OPWILL Intelligent Network Test Platform).

- CFP interface for 100GE and OTU4 Applications;
- CFP2 and CFP4 interface support with CFP-to-CFP2 and CFP-to-CFP4 adapters(*Not support now, coming soon*);
- External clock interface;
- 200ppm clock offset generation;
- Eye diagram reference clock output；
- Soft LED indicator.

OPWILL TECHNOLOGIES (BEIJING) CO., LTD.

Platform Briefs: OTP6200

- Compact and lightweight designed;
- Graphical user interface, easy to operate;
- 6.5 inches outdoor-enhanced LCD colour touch screen;
- Ultra-high capacity field-exchangeable Li-ion battery pack extends testing time;
- Powerful modular intelligent network test platform;
- Dial, number keys and function keys for flexible scrolling and selecting;
- Remote control by PC using 10/100M Base-T port.

OTM2620

100G Ethernet/OTN Test Module

Key Feature:

100G Ethernet Test:

- Optical 100Gbps 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;
- IEE802.3ah, ITU-T Y.1731 and ITU-T G.8113.1 OAM support (***Not support now, coming soon***);
- Q in Q, MPLS, MPLS-TP support;
- RFC2544 and Y.1564 SLA testing;
- Service Disruption Measurements;
- IPv4 and IPv6 traffic generations;
- BERT, loopback testing at Layer1 to Layer4;
- 100G packet capture with OPWILL Capture Software decode;
- Error Injection and Alarm Generation.

100G OTN Test:

- OTN testing for OTU4;
- 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.

CFP Test:

- Optical Lane BERT;
- PCS lager testing with skew generation and monitoring;
- Transmit and receive optical power measurement;
- Module status display.

Application

- 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 data stream generation and analysis.

General Specifications: OTP6200 + OTM2620

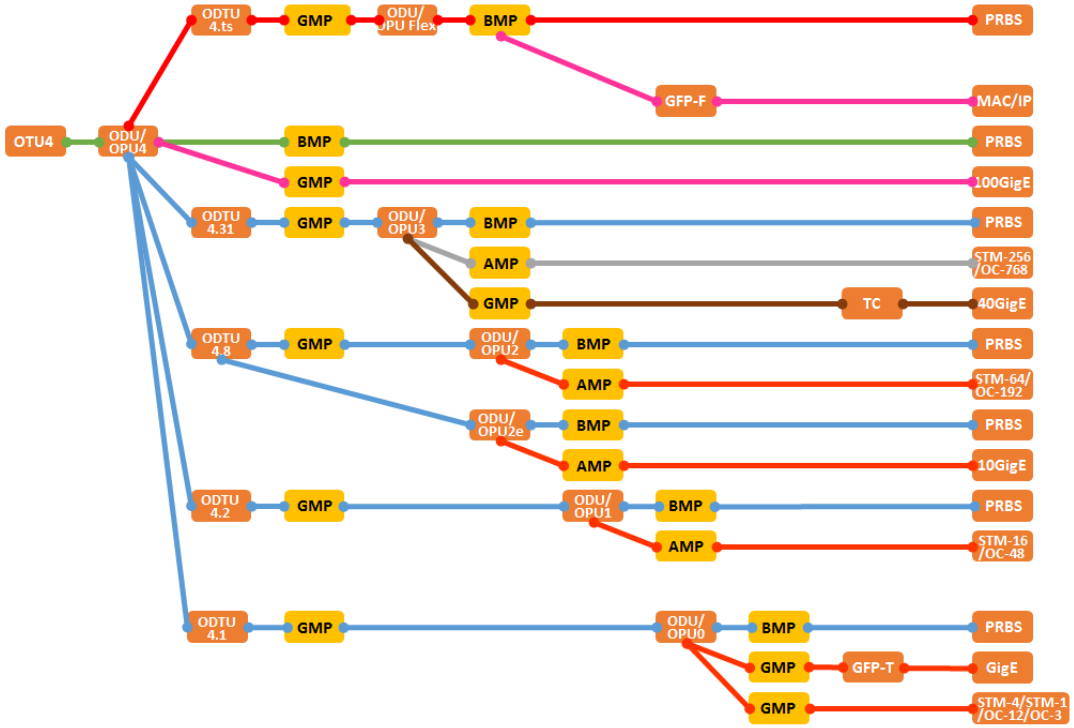
GENERAL SPECIFICATIONS	
User Interface	
Screen	6.5 Inch TFT Touch Screen (640 x 480);
Other Interface	
USB	• USB2.0, A type, 2; • USB2.0 Mini B type, 1;
Ethernet	Ethernet 10/100, RJ45;
Audio	3.5mm Audio Interface;
Storage	8G;
Physical Specifications	
Temperature	• Operating: -10°C to 50°C; • Storage: -40°C to 70°C;
Relative Humidity	0% to 95% (non-condensing);
Size(H×W×D)	• OTP6200: 319mm x 202mm x 105mm; • OTM2620: 50mm x 97mm x 259mm;
Weight	• OTP6200: 2.8kg; • OTM2620: 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: 1 hour (typical for 100G Ethernet test); • Charging time: 6 hours (typical: 25°C);
Power Source	• Input: 100-240VAC, 50-60Hz, 2A; • Output: 19VDC, 4A.

Technical Specifications: OTM2620

OTN

OTU4 Test	
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 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** ***(Coming soon)*****;** **Support to capture 256 continuous frames overhead bits** ***(Coming soon)*****.**
Though	• Though mode; • Overhead rewrite mode ***(Coming soon)***; • Enable/disable FEC encoding and decoding.
OTU4 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 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.

100G Ethernet

100G Ethernet	
Interface	CFP,100GE
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; • Decreased; • From 64 to 16,000 bits. • Increased; • Random; **IP:** • Fixed IP identifier; • IPV4 and IVP6 address configuration for source and destination; • Address increment, Decrement and Random generation supported *(Coming soon)*. **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; • Deviation: ±200 ppm (0.1-ppm steps); • Received clock; • The frequency deviation of received Ethernet signals can be measured against the internal clock. • 2.048 MHz, 2.048 Mbps, 1.544 MHz, 1.544 Mbps;
Error	• FCS; • IP/UDP/TCP check sum; • CRC4 error; • Sequence error. **100Gbps:** • Invalid block type; • Invalid alignment flag; • Invalid synchronisation code; • 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; • Speed; • Indicators for utilisation, throughput and errored frames. • Jabber detected; • Signal; • Frames • Bit rate;

OTM2620

100G Ethernet/OTN Test Module

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; • FL (count/FLR); • FDV (min/avg/max (during measurement)). • IR (min/avg/max); • FTD;
Service Performance Test	**All services tested simultaneously at CIR;** **Duration:** • 15 min; • 2 h; • 24 h; • User defined. **Results:** • Pass/fail indication; • FL (count/FLR); • FDV (min/avg/max (during measurement)). • IR (min/avg/max); • FTD;
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; • VLAN ID; • Port. • IP; • MPLS label;
MPLS	
Number of MPLS Header	Up to 3 MPLS headers set by user.
Parameters	**User defined in each MPLS header:** • Label; • TTL fields; • Address increment, decrement and random generation *(Coming soon)*. • Exp;
Statistics	Number of MPLS-TP frames
OAM (MPLS-TP) *(Coming Soon)*	**In accordance with ITU-G G.8113.1;** **Support OAM;** **ITU-T Y.1731:** • CCM; • LBR; • AIS; • LMM; • LMR; • DMM; • LBM; • LTM; • LCK; • LTR; • 1DM; • DMR; **IEE802.1ag:** • CCM; • LBM; • LBR; • LTM; • LTR.
Area to be edited	• B-label; • MAC source address; • I-label; • MAC destination address.
PBB/PBB-TE (Mac In Mac MiM (*Coming Soon*)	
Results	• Number of PBB frames; • Last received I-tag priority; • Last received B-tag VLAN ID; • Last received I-tag service ID. • Last received B-tag priority;

PBB/PBB-TE (Mac In Mac MiM (*Coming Soon*)	
OAM	**Support OAM;** **ITU-T Y.1731:** • CCM; • LBR; • AIS; • LMM; • LMR; • DMM; • LBM; • LTM; • LCK; • LTR; • 1DM; • DMR; **IEEE802.1ag:** • CCM; • LBM; • LBR; • LTM; • LTR.
Ethernet OAM (*Coming Soon*)	
Ethernet OAM Standard	• ITU-T Y.1731 (Service layer OAM); • IEEE802.1ag (Connectivity layer OAM); • IEEE802.3 (Formerly IEEE802.3ah) (Access link OAM).
Messages Supported	**Generates and receives following OAM messages:** **ITU-T Y.1731:** • CCM; • LBR; • AIS; • LMM; • LMR; • DMM; • LBM; • LTM; • LCK; • LTR; • 1DM; • DMR; **IEE802.1ag:** • CCM; • LBM; • LBR; • LTM; • LTR. **IEEE802.3ah:** • Information; • Variable request; • Variable response; • Loopback control.
Ethernet OAM (*Coming Soon*)	
IEEE802.3ah	• Discovery; • Loopback activate Statistics.
Statistics	Number of each message generated/received.
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.

OTP6200 + OTM2620 Ordering Information

OTP6200+OTM2620 STANDARD CONFIGURAIOTN	
Module	Description
OTP6200	Test platform, support SDH, OTN, Ethernet, packet Ethernet, OTDR test modules;
OTM2620	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;
	Layer 1 bandwidth statistics;
	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;
16060040	CAT5 cable, 3m, one;
16120080	SMA test cables, two;
02030320	100GBase-LR4 CFP optical module, one;
16060010	3 pins adapter cable, one;
43170020	OTP6200 100-240V input and 24V output AC/DC power adapter, one;
43160031	OTP6200 lithium polymer rechargeable battery, one;
18080010	OTP6200 disc include user manual and OPWILL remote control software, one;
19070060	OTP6200 package, one;
18010010	Factory test report, one;
18010020	Calibration certificate, one;
18040011	One year warranty service.

OTM2620

100G Ethernet/OTN Test Module

OTM2620 OPTIONAL CONFIGURATION	
Ethernet Optional Software	
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;
Optional Hardware	
43160031	OTP6200 lithium polymer rechargeable battery;
OPAP-Twowarranty	Two years extended warranty service.

Notes: Product ordering information may update along with the product upgrade, please refer to the final version provided by our sales.

Please visit our website for the further information: www. OPWILL.com

OPWILL TECHNOLOGIES (BEIJING) CO., LTD.

Add: Room 415, Digital Media Building, No.7 Shangdi Information Road, Haidian District, Beijing, PRC. 100085

Tel: +86(10)8277-1386/2866/3382

Fax: +86(10)8277-1782