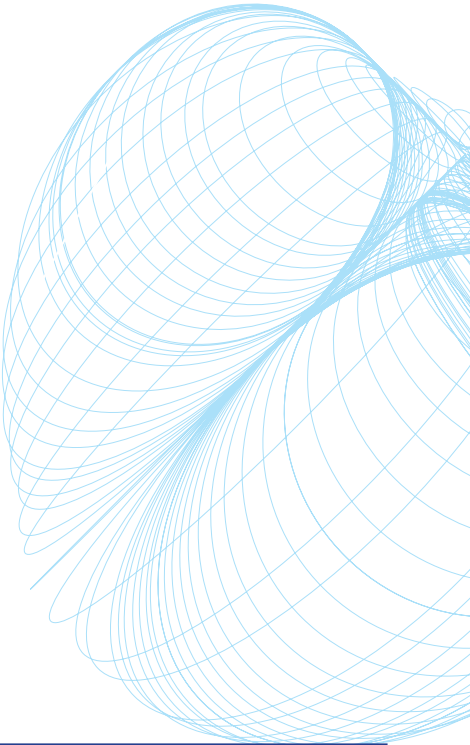




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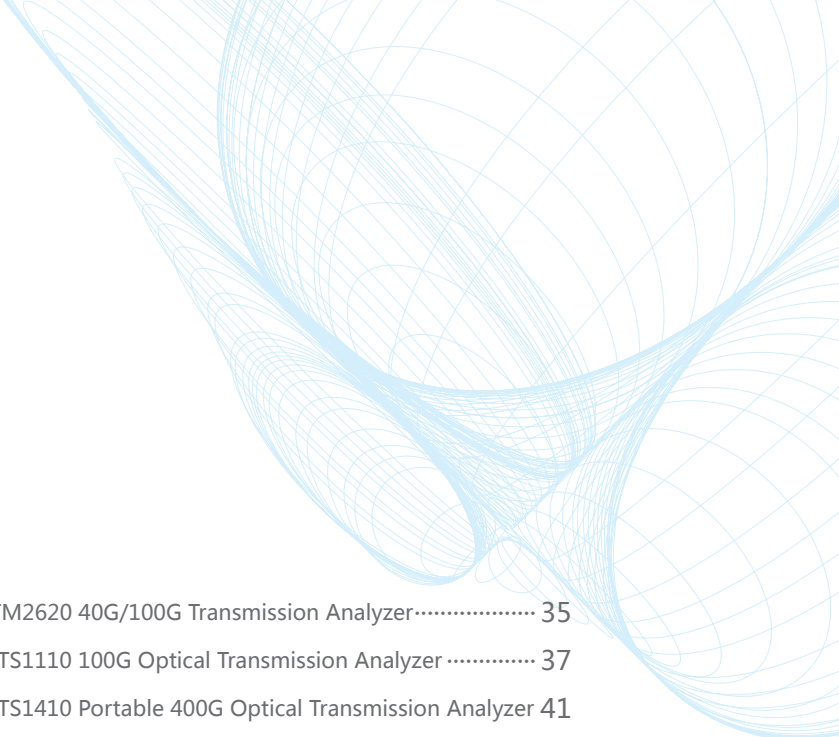
OPTIMIZE THE TEST AS YOUR WILL

Telecom Test Instruments Catalog



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►► Company Profile





OPWILL Technologies (Beijing) Co., Ltd. was established in 2007 in the Zhongguancun National Independent Innovation Demonstration Zone in Beijing. The entrepreneurial team comes from internationally renowned communication instrument or equipment manufacturers, and the core personnel have high-level research and development capabilities and rich market experience.

OPWILL has been committed to providing users with accurate, reliable, and convenient communication testing solutions since its establishment. The company's products cover testing fields such as fiber optics, transmission, data, and clock synchronization, and are widely used in the production, installation, and maintenance of communication equipment, serving communication equipment manufacturers, operators, private network users, and communication construction and maintenance service enterprises.

OPWILL currently has dominated the TOP 3 China telecom operators' test instrument market currently. Also, for overseas market, OPWILL products has been sold to the Telecom Operators and Network Providers in over 30 countries and regions such as BSNL, OPTUS, Vodafone, American Tower, Reliance Jio, VNPT, BTC/VIVACOM. etc. Besides that, the System Equipment Providers such as ERICSSON, Coriant, all are/were OPWILL's Product users.

With the stable and reliable development, OPWILL vision is Optimizing the test as your will for all our distinguished customers and valuable partners.





Product Introduction



1. FTS20 Series Optical Light Source/Optical Power Meter/Optical Multimeter

The FTS20 series handheld light source, optical power meter, and optical multimeter have a perfectly rounded appearance, comfortable grip, and excellent compatibility and ease of use.

The FTS20 is specially designed with shock-absorbing and dust-proof protective covers suitable for outdoor and on-site environments, as well as a bright display screen; Capable of storing a large amount of test data on site and downloading it to a PC via USB interface for saving and generating test reports; Suitable for testing applications in LAN/WAN access networks, enterprise networks, telecommunications networks, DWDM networks, CATV networks, as well as single mode and multi-mode environments.

Feature

- The appearance is extremely round, comfortable to grip, and has excellent affinity and ease of use;
- Single mode and multi-mode testing;
- PON, LAN/WAN, DWDM, CATV, Telecommunications and other network testing applications;
- Light source, VFL, optical power meter testing mode;
- 3-year calibration cycle;
- Data storage, download test data through USB interface and PC connection;
- Automatic wavelength detection;
- Provide dry battery and power adapter power supply mode.



Application

- Optical power test, link loss test, and link connectivity check;
- Multi mode fiber optic testing for enterprise LAN;
- Single mode and multi-mode combination testing of access network and metropolitan area network;
- Multiple testing applications such as telecommunications and Cable TV networks;
- Fiber testing, especially suitable for long-distance fiber operation.

Specification

Optical Light Source					
Parameter	Single Mode				Multi Mode
Wavelength (nm)	1310/1550	1310/1490/1550	1490/1625	1550/1625	850/1300
Output Mode (Hz)	CW, 270, 1K, 2K				
Emitter type	FP-LD@1310/1550nm	FP-LD@1310/1550nm	DFB-LD	DFB-LD	FP-LD@1300nm VCSEL@850nm
Spectral width	≤5nm				
Output power	≥-3dBm				
Stability	±0.02dB/15Min ; ±0.05dB/8h				
Automatic wavelength recognition	Support (in conjunction with OPWILL optical power meter)				
Optical Interface	Standard FC interface, optional SC, LC and other interfaces				
Optical Power Meter					
Type	PM1		PM2	PM3	
Detector Type	InGaAs		InGaAs	InGaAs	
Measuring range(dBm)	-70~+10		-50~+27	-65~+13	
Maximum Input Power (dBm)	+13		+30	+15	
Wavelength Range	800 ~ 1625(Step 1nm)				
Calibrate wavelength	850; 1270;1300; 1310; 1490; 1550; 1577;1625; 1650				
Measurement accuracy	±0.2dB (±5%)				
Resolution ratio	0.01dB				
Linearity rate	0.06dB				
Display Unit	W; mW; uW ; nW ; pW ; dBm ; dB				
Modulation wave recognition (Hz)	270, 1K, 2K, CW				
Automatic wavelength recognition and switching	Automatic setting 850; 1300; 1310; 1490; 1550; 1625; 1650nm wavelength; Used in conjunction with OPWILL light source				
Stability/Repeatability	±0.1dB				
Multi wavelength testing function	Support				
Automatic determination of pass/fail	Support				
Interface type	Standard FC interface, optional SC, LC and other interfaces				
VFL					
Wavelength	650±20nm				
Output Power	+5 dBm				
Output Mode	CW, 1Hz				
Interface type	Universal 2.5mm				

2. FTS510 Series Handheld OTDR Tester

FTS510 Series Handheld OTDR Tester is entirely new pad product released by OPWILL. It has rapid start technology and supports automatic and real-time test mode which can guarantee engineers to examine and detect optical fibres or cables in MAN; AN/FTTx, and LAN network with high flexibility, efficiency, and convenience. Meanwhile, its operation system interface has high similarity with Android GUI, significantly simplifies the test procedure.

Feature

- 5.6 inch touchscreen, outdoor enhancement;
- Portable, and durable, particularly designed for outdoor use;
- Support 1310, 1490, 1550, 1625/1650nm wavelengths;
- Dynamic range up to 43dB;
- Event dead zone 0.8m, attenuation dead zone 3.5m;
- Support VFL function, Ethernet, USB2.0;
- Accessories: Light source, Power meter, iOTA (Intelligent Optical Link Topology), iNET (Intelligent Network Test Tool), Fibre scope.



技术规格

Mode	FTS510-M-ac		FTS510-H-ac		FTS510-N-ac		FTS510-L-ac	
Wavelength(nm)	1310/1550		1310/1550		1310/1550		1310/1550	
DynamicRange(dB)	43/42		40/39		35/34		32/30	
Mode	FTS510-H-acd		FTS510-H-abcd		FTS510-H-abe		FTS510-H-abce	
Wavelength(nm)	1310/1550/1625		1310/1490/1550/1625		1310/1550/1650		1310/1490/1550/1650	
Dynamic Range(dB)	40/39/38		40/37/39/38		40/39/38		40/37/39/38	
Pulse Width (ns)	3 to 20,000	Event Dead Zone (m)		0.8		Attenuation Dead Zone (m)		3.5
Sampling Resolution (m)	0. 04 to 2	Sampling point		256K		Test Time (s)		1 to 300, Real time
Storage	16G							
Distance Uncertainty (m)	±(0.75+0.0050% × Distance +Sampling Resolution)							

Application

- Access network, metropolitan area network, and backbone network fiber optic cable opening, maintenance, testing, and measurement;
- Troubleshooting, repair, testing, and measurement of fiber optic cable faults in access networks, metropolitan area networks, and backbone networks;
- FTTx network fiber optic cable opening, maintenance, troubleshooting, repair testing and measurement;
- Installation and maintenance testing of fiber optic communication systems;
- Maintenance and testing of fiber optic networks in industries such as military, power, railway, subway, and operator energy.

3. MTS1000+FTS1100 SM/MM High-Performance OTDR

In today's highly precise and complex technological environment, the key to ensuring product quality and performance lies in having accurate, efficient, and reliable testing instruments. MTS1000+FTS1100 OTDR, An advanced testing instrument equipped with a brand new 10 inch touch platform is leading a new era of testing work with unprecedented convenience and accuracy.

This product integrates the latest industry standard G.654E fiber, single-mode and multi-mode fiber testing functions. By integrating intelligent optical eye technology, supporting dual end testing mode, macro bend detection function, small blind spot design, and providing up to 50dB dynamic range testing capability, it achieves comprehensive coverage of functions and significant performance improvement. With just one MTS1000+FTS1100 OTDR, it can easily meet the diverse needs of the market, from the latest G.654E single-mode to multi-mode, long-distance cable maintenance, cable production and manufacturing to project acceptance testing.

It is worth mentioning that MTS1000+FTS1100 OTDR deeply integrates IoT technology, not only supporting remote control, making testing work no longer limited by geography, but also achieving intelligent presentation and instant uploading of test results. This feature greatly simplifies the management process of test results, enabling users to seamlessly integrate with asset management and operation systems, further improving work efficiency and the convenience of data management. The MTS1000+FTS1100 OTDR has become an indispensable testing tool in today's technology field due to its excellent performance, comprehensive functions, and intelligent operating experience, providing solid technical support for ensuring product quality and performance.



Feature

- A 10 inch high-definition display screen provides clear, bright, and easily readable test data and images, even in complex environments;
- This instrument not only supports the latest G.654E fiber optic opening, maintenance, and fault location testing, but also is widely compatible with testing and measurement of single-mode and multi-mode fibers;
- Based on Linux system, MTS1000+FTS1100 OTDR has a simple and intuitive operation interface, allowing you to quickly get started without tedious learning. With simple settings, test preparation can be quickly completed, improving work efficiency;
- Durable and sturdy design, the shell is made of high-strength materials with good protective performance, suitable for various harsh working environments, and undergoes strict quality testing to ensure long-term reliable operation;
- iOTA Function, 0.8m event blind spot, perfect combination of minimum 4cm sampling resolution and up to 50dB dynamic range;
- Comprehensive OTDR testing function, measuring the position and insertion loss information of optical connectors, fiber joints, and fusion points on single-mode optical fibers, to meet the testing and maintenance of the entire optical fiber link;
- Supports any four wavelength combination of 850/1300/1310/1490/1550/1625/1650nm, with a dynamic range of up to 50dB;
- Support online testing, with a maximum ability to pass through a 1:128 splitter;
- Short enough blind spots (event dead zone: 0.8m, attenuation dead zone 4m) and up to 25600 sampling points to ensure accurate testing of MTS1000+FTS1100 throughout the entire fiber optic link;
- Quick testing mode with automatic tracking diagnosis, one click setting, and event detection;
- The dual marking line function is used for distance, attenuation, and fusion loss measurement;
- Support PC offline analysis software for offline data analysis and printing;
- The instrument supports generating PDF reports and printing test reports directly to a printer.

Application

- Access network, metropolitan area network, and backbone network fiber optic cable opening, maintenance, testing, and measurement;
- Troubleshooting, repair, testing, and measurement of fiber optic cable faults in access networks, metropolitan area networks, and backbone networks;
- FTTx network fiber optic cable opening, maintenance, repair testing and measurement;
- Installation and maintenance testing of fiber optic communication systems;
- Maintenance and testing of fiber optic networks in industries such as military, power, railway, subway, operator, and energy;
- Maintenance and fault testing measurement of fiber optic cables exceeding 200km.

3. MTS1000+FTS1100 SM/MM High-Performance OTDR

Specification

Type	MTS1000+FTS1100	
Wavelength	1310/1550/1490/1625/1650nm	850/1300nm
Dynamic Range (dB)	40-50dB (20μs)	850/1300nm:24/28dB(2.5μs)
Test Fiber	10μm/125μm Single Mode (ITU-T G.652, G.654)	
Pulse	3, 5, 10, 30, 50, 100, 275, 500, 1000, 5000, 10000, 20000 ns, User defined	
Test Distance	0.1 , 0.5, 2.5, 5, 15, 40, 80, 120, 160, 200,240,320,400km, User defined	
Dead Zone	0.8m/4m	
Sampling	Sampling Resolution:0.03 – 1 m, Sampling Point:256000	
Reflection parameter settings	1.00000 – 2.00000	
Distance uncertainty	$\pm(0.75+0.005\%\times\text{Distance} + \text{Sampling Resolution})$	
Linearity	$\pm 0.03 \text{ dB/dB}$	
Measuring time	5s-180s	
VFL	Wavelength	650 ±20nm
	Output Power	+10 dBm
	Output Mode	CW, 1Hz

Specification

Optical power meter	Wavelength Range	780 to 1800nm
	Calibration wavelength	850,1300,1310,1490,1550,1625nm
	measuring range	+10 ~ -70 dBm/+26~ -50 dBm
	Resolution	0.01dB
	Measurement accuracy	±0.2dB (±5%)
Optical light source	Work wavelength	1310/1550 ±20nm
	Output power	> -3 dBm
	Output mode	CW, 270Hz,330Hz,1KHz,2kHz
	Stability	±0.05dB/15 Minute ; ±0.1dB/8 hour
IoT functionality		Support IoT management functions (unique ID, anti loss, anti-theft, automatic timed location information)
Bi-direction test		The near end OTDR can remotely control the far end OTDR to achieve automatic bidirectional testing of the same optical fiber, including bidirectional OTDR testing, bidirectional loss, and bidirectional return loss. And save the bidirectional test results in a file format on the near end OTDR
Remote operate		Support remote operation through mobile and computer apps. The instrument panel can obtain geographic temperature, humidity, GPS coordinates, photos, SOR, test report files, and other data that can be uploaded to the cloud or designated servers/WeChat for sharing
iOTA		Intelligent combination of different pulse widths, one click automatic testing to obtain loss and reflection coefficients of optical fibers, splitters, distribution cables, backbone cables, etc. Automatically determine the topology structure of the optical network and display it in an intuitive graphical way
iNET		Includes PING, Traceroute, FTP, HTTP, Packet capture and parsing. Used to determine the connectivity of data links. Integrate the following functions for ping bandwidth testing, supporting mutual ping testing between two instruments, with a bandwidth of up to 10000M. SpeedTest Test, WIFI Test, VCT Test, Wireshark
Fiber optic end face microscope		400x fiber optic end face microscope, supporting various fiber optic interfaces such as FC, SC, LC, ST, etc., intelligently determines whether the fiber optic end face is qualified
Test Report		SOR format test report, iOTA test report, fiber quality certification test report, PDF test report, and printing
Laser safety		IEC 60825-1 : 2007 : CLASS 1 21 CFR 1040.10

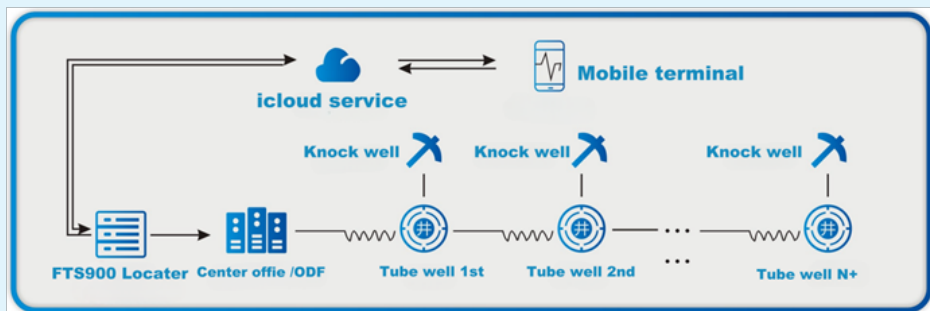
4. FTS900 Fiber Optic Cable Routing Locator

The vast and complex optical transmission networks of operators, railways, oil pipelines, military forces, power communication, etc. pose great challenges to the management and maintenance of fiber optic mute resources due to their passive, wide laying range, concealment, and diversified carrying business characteristics; At the same time, with the extensive relocation of communication engineering, there is a serious disconnect between the data and actual situation in fiber optic communication systems; When encountering emergency faults, finding the real route and fault point can only be eliminated by opening each manhole cover, making maintenance and troubleshooting work very difficult for maintenance personnel.

The FTS900 fiber optic cable locator can search and locate buried optical cables and pipeline optical cables, generate specific location data for optical cable joint boxes, breakpoint positions, and light attenuation, provide support services for optical cable line and pipeline construction protection, improve the work efficiency of optical cable line maintenance and inspection personnel, and comprehensively grasp the status of optical cables.



Working principle



The optical fiber is used as a vibration sensor to collect the vibration of the remote end, and as a carrier for signal transmission, it transmits the reflection signal generated by the vibration to the system host. After the analysis of the equipment host, the algorithm calculation is performed to give the signal analysis results, and the results are returned to the remote end via the Internet. The remote troubleshooting personnel implement simple tapping, see the results synchronously, and judge the cable route immediately.

The FTS900 fiber optic cable routing locator can search and locate buried optical cables and pipeline optical cables, generate specific location data for fiber optic cable joint boxes, fiber breakage points, and light attenuation points, and provide pipeline construction protection support services.

Feature

- The demand for optical cable routing data in various aspects such as design, completion acceptance, fault diagnosis, and resource verification applicable to fiber optic communication engineering;
- FTS900 connects optical cables from the ODF rack in the data center, collects real-time micro vibration signals and GPS location information, uploads them to the cloud, and finally transmits them to the handheld terminals of on-site staff. The staff only need to tap the manhole cover to confirm whether the optical cable has passed through the manhole. It can be applied to daily fiber optic cable resource design, completion acceptance, and routing precision labeling. No need to team up, no need to open wells, no need to lift cables, 1 person 1 hammer 1 terminal 1 minute to lock the fiber optic cable routing information;
- FTS900 overcomes the weakness of traditional OTDR (OTDR cannot determine the exact location and direction of the fault point when finding the breakpoint). In addition to being able to see the distance of the fault point, it can also locate the tapping distance when tapping the manhole cover, thereby determining the direction of the optical cable, accurately, quickly, and precisely locating the fault point, and quickly completing the optical cable repair work;
- FTS900 can achieve real-time online monitoring of multiple optical cables over a large area by stacking optical switches, timely detecting fault points, actively controlling and avoiding operational risks, transforming passive notification into active monitoring, and realizing the full process operation, maintenance and management of optical cable mute resources;
- Deploy FTS900 fiber optic cable routing locator, which can be integrated with existing resource management systems to achieve data collection and management utilization of fiber optic cable mute resources.

4. FTS900 Fiber Optic Cable Routing Locator

Technical Specifications

Model	FTS900
Working Wavelength	1550 ±25nm
Interface quantity	1-4pcs
Detection range	0-40km
Positioning accuracy	±2m
Target fiber optic cable search	40km , Cooperate withFCH500
Number of optical channels	4 (Scalable)
Sensitivity	<0.1nε@5-100Hz
Working mode	Continuous
Interface type	E2000/APC
Laser safety	IEC 60825-1 : 2007 : CLASS 1 21 CFR 1040.10

Technical specifications of cable finder (optional)

Model	FCH500
Operating Frequency	340Hz
Charging	DC5V/1A
Battery capacity	600mAh
Endurance	2H
Power	3W
Vibration intensity	3-level adjustable
Operation temperature	-10°C to 45°C ;
Storage temperature	-20°C to 70°C
Size	20x5x3cm
Weight	248g

OTDR Technical Specifications (Optional)

Model	Built into FTS900, optional
Wavelength	1310/1550/1625±20nm
Dynamic Range (dB)	22-45dB
Test fiber	10µm/125µm single mode (ITU-T G.652)
Pulse width	3, 5, 10, 30, 50, 100, 275, 500, 1000, 5000, 10000, 20000 ns
Distance range	0.5, 2.5, 5, 15, 40, 80, 120, 160, 200,240km
Event Dead Zone	≤0.8m
Attenuation Dead Zone	≤4m
Sampling resolution	0.04 – 1 m
Sampling point	256000
Reflection parameter settings	1.30000 – 1.80000
Test distance uncertainty	±(0.75+0.001%×Distance + Sampling resolution)
Attenuation resolution	0.001dB
Linearity	±0.03 dB/dB
Loss threshold	0.01dB
Measuring time	5s-180s, Real-time
Laser Safety	IEC 60825-1 : 2007 : CLASS 1 21 CFR 1040.10

Application

- Inventory of optical cable resources, planning and design of optical cable lines for fiber optic communication systems;
- Fiber optic cable routing tracking precision labeling, maintenance and repair, network optimization and upgrade;
- Telecom operators' fiber optic cable fault location and troubleshooting;
- Installation and construction of new optical cables, acceptance testing of cutting and renovation projects;
- Daily maintenance and inspection;
- Fiber optic cable resource management, collaborative positioning with other facilities.

5. PFS220 Fusion Splicer

PFS220 Fusion Splicer is designed by OPWILL. Small in size, and light in weight. 7 seconds fastsplicing, and 15 seconds arc heating. It adopts advanced PAS Fibre adjustment technology, and drive four motors, has fibre adjustment function. It is not only used for FTTX project, but also can be used for the trunk line. PFS220 is a machine which is the smallest volume, the lightest weight, the most fast splicing speed.

Feature

- Hardness: The body is made from titanium alloy, and it has rubber protection function, quakeproof, waterproof, dustproof;
- Fast: 7s fast splicing, 15s fast heating, support continuous heating;
- 4 Motors core alignment, automatic zoom model, core to core alignment;
- Long life time: 1 group batteries, 240 times splicing and heating;
- Conveniences: Convenient for maintenance.



5. PFS220 Fusion Splicer

Specification

Size and Weight	120D×120W×130H (mm); 1.66kg (with batteries)	Alignment	Core; Cladding; Fine
Applicable Fibre Count	Single	Interface	USB2.0
Applicable Fibre Type	SM (ITU-T G.652); MM (ITU-T G.651); DS (ITU-T G.653);NZ/ NZDS (ITU-T G.655); BI(ITU-T G.657)	Applicable Fibre Diameter	Cladding: 80um to 150um; Coating: 100um to 1000um
Splice Mode	Stored 40 groups, 80 groups of user-defined	Splicing Time	9s (typical time) or 7s (fast type)
Maximum Storage	10,000 set of the latest record storage	Return Loss	≥60dB
Applicable Sleeve Length	60mm/45mm/40mm (FP-03)	Average Splice Loss	0.02dB (SM); 0.01dB (MM); 0.04dB (DS); 0.04dB (NZ/NZDS)
Operating Environment	Altitude: 0 to 5,000m; Humidity: 0% to 95% relative; Temperature: -20°C to 50°C; Wind speed: 15m/s	Screen	4.3 inch could LCD
Tensile Test	≥2N	Battery	Typical work 240 cycles (splicing / heating); Fully charge 3 hours; Recharge cycles 500 times; 4000mAh lithium battery
Optical Magnification	X or Y: 520 times	Power Supply	4000mA lithium battery; AC100-240V power adapter

6. PFS220T Fusion Splicer

PFS220T Fusion Splicer is designed by OPWILL. Small in size, and light in weight. 7 seconds fastsplicing, and 15 seconds arc heating. It adopts advanced PAS Fibre adjustment technology, and drive four motors, has fibre adjustment function. It is not only used for FTTX project, but also can be used for the trunk line. PFS220T is a machine which is the smallest volume, the lightest weight, the most fast splicing speed.

Feature

- Hardness: The body is made from titanium alloy, and it has rubber protection function, quakeproof, waterproof, dustproof;
- Fast: 8s fast splicing, 20s fast heating, support continuous heating;
- 6 Motors 3D fiber core alignment;
- Long life time: 1 group batteries, 240 times splicing and heating;
- Conveniences: Convenient for maintenance.



6. PFS220T Fusion Splicer

Specification

Size and Weight	130W×135D×130H (mm); 1.77kg (with batteries)	Alignment	Core; Cladding; Fine
Applicable Fibre Count	Single	Interface	USB2.0
Applicable Fibre Type	SM (ITU-T G.652); MM (ITU-T G.651); DS (ITU-T G.653);NZ/ NZDS (ITU-T G.655); BI(ITU-T G.657)	Applicable Fibre Diameter	Cladding: 80um to 150um; Coating: 100um to 1000um
Splice Mode	Stored 40 groups, 80 groups of user-defined	Splicing Time	9s (typical time) or 7s (fast type)
Maximum Storage	10,000 set of the latest record storage	Return Loss	≥60dB
Applicable Sleeve Length	60mm/45mm/40mm (FP-03)	Average Splice Loss	0.02dB (SM); 0.01dB (MM); 0.04dB (DS); 0.04dB (NZ/NZDS)
Operating Environment	Altitude: 0 to 5,000m; Humidity: 0% to 95% relative; Temperature: -20°C to 50°C; Wind speed: 15m/s	Screen	5.0 inch could LCD
Tensile Test	≥2N	Battery	Typical work 240 cycles (splicing / heating); Fully charge 3 hours; Recharge cycles 500 times; 4000mAh lithium battery
Optical Magnification	X or Y: 460 times	Power Supply	4000mA lithium battery; AC100-240V power adapter;

1. OP1200 Series E1 BERT Analyzer

OP1200 series E1 BERT Tester is a hand-held testing instrument which integrates E1 and optical power meter testing functions. It can provide error code, alarm and upper-level business level test for comprehensive evaluation of network quality. It can directly display statistical results in an intelligent or advanced operation mode. It can be used to install, test and maintain on-site for engineers and maintenance personnel. Field installation, testing and maintenance, save a lot of time.

Feature

- Handheld 4.3inches colour and display screen;
- Online or outline business service testing;
- Non framing and framing operations (PCM-30, PCM-30C, PCM-31, PCM-31C);
- 2.048Mbps (Nx64kbps, N=1 to 31) Speed Sending/Receiving;
- BERT Testing;(G.821, G.826, M.2100/550, C37.94);
- Alarm generation/error insertion test;
- Fully automatic and advanced operation mode;
- Results data storage/printing functions;
- Optical power meter.



2. OTP6126 Handheld Gigabit Ethernet Tester

OTP6126 Handheld Gigabit Ethernet Test Set is one of Ethernet test product of OPWILL. The product fully meets Ethernet standards (ITU-T Y.1564, IETF RFC2544, IETF RFC3393, IEEE 802.3, IEEE802.1 etc.), and supports Ethernet WAN and LAN network test with high reliability, convenience, and flexibility. Meanwhile, the module can provide a high efficient SLA test function for service provider.

Feature

- Support 1 Gbit/s data stream in maximum;
- Support RFC2544, includes Throughput, Frame Loss, Latency, and Back-to-Back;
- Support RFC3393 Packet Jitter test;
- Support Y.1564 test;
- Support BERT and Loopback test from Layer 1 to Layer 4;
- Support Through test;
- Support IPV6 test;
- Support Service Disruption test;
- Support to set 8 data stream in maximum, each data stream can conduct Throughput, Latency, Frame Loss, and Packet Jitter.

Application

- Ethernet performance evaluation for operator or customer;
- BERT, RFC2544, and SLA verification.



3. OTP6200+OTM2515/2517 155M/2.5G SDH Transmission Analyzer

The OTP6200+OTM2515/OTM2517 155M/2.5G transmission analyzer is part of the OTP6200 intelligent network testing platform product family. It is a robust and long-lasting traditional PDH/SDH testing solution powered by lithium batteries, supporting transmission link testing at speeds ranging from 2.5Gbps to 2.048Mbps. Support the installation, maintenance, and troubleshooting of both online and offline transmission links for application testing.

At the same time, it provides advanced transmission testing functions for experienced transmission network maintenance personnel, such as cost monitoring and control, APS protection switching testing, pointer monitoring and adjustment, etc. All measurements comply with the latest international industry standards and are able to test transmission link failures through various methods, allowing operators to gain insight into all possible causes of transmission link failures.

Function Features

- Support DSn/PDH testing function for DS1/DS3, E1/E2/E3/E4 interfaces;
- Support SDH/SONET testing function for STM-1/OC-3 electrical ports, STM-1/4/16 and OC-3/12/48 optical ports;
- Support 120 ohm E1 testing function based on RJ48 interface;
- PDH/SDH bit error testing and performance analysis;
- SDH/SONET overhead monitoring and control;
- Pointer monitoring and adjustment, generate G.783 pointer test sequence;
- Automatic protection switching time test;
- Support payload mapping from VC4-16c/STS-48c to VC12/VT2, VC11/VT1.5, including PDH/DSn payload.



Application

- TDM network installation, maintenance, and troubleshooting;
- Online and offline testing;
- Loop delay test;
- Performance evaluation of dedicated network for major clients.



4. OTP6200+OTM2612 10G fgOTN/OSU Transmission Analyzer

The OTP6200+OTM2612 10G multi service analyzer integrates OTN, OSU, SDH, SONET, PDH, DS_n, SPN, Ethernet and other transmission and data testing solutions. And it has the latest RFC6349 testing functions and methods, providing testing tools for mobile operators, equipment suppliers, and communication engineering construction units to open transmission networks, data networks, and synchronization networks, maintain and troubleshoot faults. Provide users with a cost-effective, high-performance, and high-precision integrated testing instrument for 4G/5G network activation.



Platform Highlights

The OTP6200 intelligent network testing platform provides comprehensive communication technology connection and service testing functions, supporting OTN, SDH/SONET, MSTP, PDH/DS_n, PTN/IP RAN, SyncE, IEEE1588v2 PTP, OTDR, Ethernet, etc.

- Designed to be sturdy, compact, and easy to carry;
- A powerful modular intelligent network testing platform;
- Graphic user interface, easy to operate;
- Rich button design, supporting knobs, numeric keys, and function keys for convenient and flexible input and selection;
- 6.5-inch outdoor enhanced LCD touch color display screen, suitable for outdoor environment use;
- Fast export of test results based on USB 2.0 interface;
- Remote access and control based on 10/100M Base-T interface.

Function Features

- Dual port or four port OTN, OSU, SDH, SONET, PDH, DSn, SPN, and carrier grade Ethernet testing functions integrated;
- Provide dual end Ethernet monitoring and penetration function.

Ethernet

- Two 10G Base-X test interfaces, dual port 10G WAN/LAN test interfaces;
- Two 10/100/1000M Base-T, 100M Base FX, and 1000M Base-X test ports, supporting full duplex and half duplex adaptation for all interfaces;
- According to the RFC 2544 standard, perform throughput, back-to-back, latency, and frame loss measurements (bidirectional results);
- Complete Y.1564 test kit (bidirectional results). Y. 1564 can provide comprehensive on-site testing for mobile return and commercial services;
- Support TCP throughput testing function based on RFC6349 standard;
- Support online business scanning based on destination/source MAC, destination/source IP, 3-layer VLAN ID, and 3-layer MPLS Label;
- Up to 512 data streams are generated and analyzed, providing throughput, latency, frame loss, and packet jitter measurements for each data stream;
- Support packet jitter testing based on RFC3393 standard to evaluate changes in IP packet delay;
- Support advanced PING testing function for specifying IP address pools;
- Error code, loopback, and remote intelligent loopback testing from Layer1 to Layer4;
- Conduct penetration testing and insert network damage during the penetration process to verify network performance;
- Service interruption testing.

4. OTP6200+OTM2612 10G fgOTN/OSU Transmission Analyzer

OTN

- Compliant with ITU-T G.709 and G.sup43 standards;
- Two OTU0, OTU1, OTU2, OTU1e, and OTU2e interface tests;
- The OTU0 interface meets the definition of OTU0 in ITU-T G.709 and China Mobile Communications Enterprise Standard 'Technical Specification for Customer Side Optical Transport Network (CPE OTN) Equipment' ;
- OTU0 meets the following mapping structure of ITU-T G.709 and China Mobile Communications Enterprise Standard 'Technical Specification for Customer Side Optical Transport Network (CPE OTN) Equipment' :
 - PRBS->BMP->OPU0->OTU0
 - STM-1->GMP->OPU0->OTU0
 - STM-4->GMP->OPU0->OTU0
 - GE->GFP-T->GMP->OPU0->OTU0
 - MAC (up to 10G speed) ->GFP-F ->BMP ->OPU2->OTU2
- Synchronous or asynchronous mapping of SDH/SONET signals;
- Error insertion and alarm generation of OTU, ODU, OPU;
- Monitoring and control of overhead bytes for OTU, ODU, and OPU;
- APS automatic protection switching time measurement;
- Loop delay testing function.

OSU version 00

- Two OTU0, OTU1, OTU2, OTU2e test interfaces, using SFP+physical interface type;
- Compliant with the testing requirements of China Unicom Group's enterprise standard 'Technical Requirements for Optical Transport Network (OTN) Equipment Based on Optical Service Units (OSUs) of China Unicom';
- OSU cost editing (excluding non editable bytes and bits) and monitoring;
- OSU error insertion and monitoring, OSU alarm insertion and monitoring;
- Support insertion and monitoring of OSU layer errors, including the following OSU layer errors: CRC, TCMBIP8, PMBIP8;
- Support insertion and monitoring of OSU layer alarms, including the following OSU layer alarms: LOF LOM, TCMLOM, TCMBDI, TCMLTC, PMLOM, PMBDI, LOPB, AIS, OCI, LCK ;

OSU version 00

- Supports OSU bidirectional delay testing function, with a delay testing range of 0-1s and a delay testing accuracy of 0.01ms;
- Support OSU lossless bandwidth adjustment testing function, support setting of default bandwidth, adjusted bandwidth, and time, and support fault simulation based on No_SW-INc_Ack, No_SW-Dec-Ack, No_SW-INc_Confirm-Ack, Has_SW-INc_Ack to work on the sink end; The testing function of simulating the effect of the fault on the source end for No_SW-INc_Confirm_Seq;
- OSU version 00 mapping reuse structure
 - OTU0<-ODU0<-OSU<- ETH,CBR
 - OTU1<-ODU1<-OSU<- ETH,CBR
 - OTU2<-ODU2<-OSU<- ETH,CBR
 - OTU2e<-ODU2e<-OSU<- ETH,CBR
 - ODUflex.ts (N*1.25G) <-OSU<- ETH,CBR

OSU version 01

- Two OTU0, OTU1, OTU2, OTU2e test interfaces, using SFP+physical interface type;
- Compliant with the testing requirements of China Telecom Group's enterprise standard 'Technical Requirements for M-OTN Equipment in China Telecom Metropolitan Area;
- OSU cost editing (excluding non editable bytes and bits) and monitoring;
- Support insertion and monitoring of OSU layer errors, including the following OSU layer errors: CRC TCM1BIP8, TCM1BEI, TCM2BIP8, TCM2BEI, PMBIP8, PMBEI;
- Support insertion and monitoring of OSU layer alarms, including the following OSU layer alarms: LOF LOM, TCM1LOM, TCM1BDI, TCM1LTC, TCM2LOM, TCM2BDI, TCM2LTC, PMLOM, PMBDI, LOPB, AIS, OCI, LCK;
- Supports OSU bidirectional delay testing function, with a delay testing range of 0-1s and a delay testing accuracy of 0.01ms;
- Support OSU lossless bandwidth adjustment testing function, support setting of default bandwidth, adjusted bandwidth, and time, and support fault simulation based on No_SW-INc_Ack, No_SW-Dec-Ack, No_SW-INc_Confirm-Ack, Has_SW-INc_Ack to work on the sink end; The testing function of simulating the effect of the fault on the source end for No_SW-INc_Confirm_Seq;
- OSU Version 01 Mapping Reuse Structure
 - OTU0<-ODU0<-OSU<-PRBS, ETH, CBR
 - OTU1<-ODU1<-OSU<-PRBS, ETH, CBR
 - OTU2<-ODU2<-OSU<-PRBS, ETH, CBR
 - OTU2e<-ODU2e<-OSU<-PRBS, ETH, CBR
 - ODUflex.ts (N * 1.25G)<- OSU<- PRBS, ETH, CBR

4. OTP6200+OTM2612 10G fgOTN/OSU Transmission Analyzer

SDH/SONET

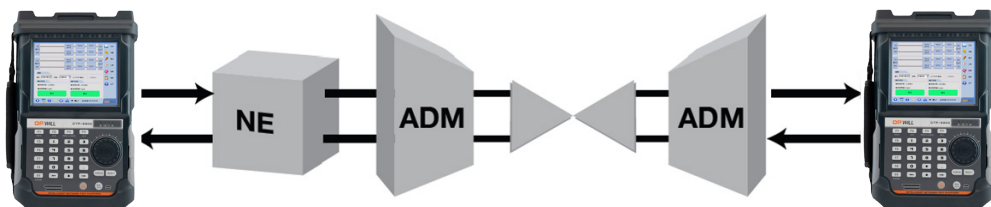
- Two STM-1/STM-4/STM-16/STM-64 and OC-3/OC-12/OC-48/OC-192 optical port tests;
- Support mapping and demapping from VC4-64c/STS-192c to VC11/VC12 and VC1.5/VT2;
- Control and decoding of SDH/SONET overhead;
- Pointer monitoring and adjustment, generation of G.783 pointer test sequence;
- Automatic protection switching time measurement;
- Loop delay testing function.

PDH/DSn (OTM2515 option)

- Support DSn/PDH testing function for DS1/DS3, E1/E2/E3/E4 interfaces;
- Support testing function for 1 STM-1 and OC-3 optical and electrical port SDH/SONET;
- Support 120 ohm E1 testing function based on RJ48 interface;
- PDH/DSn bit error testing and performance analysis;
- Automatic protection switching time test;
- Loop delay testing function;
- Support error performance testing based on ITU-T G.821, G.826, G.828, and M.2100 standards.

Application

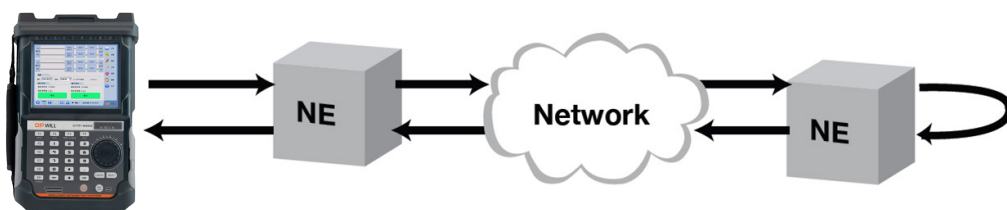
Off-line Testing



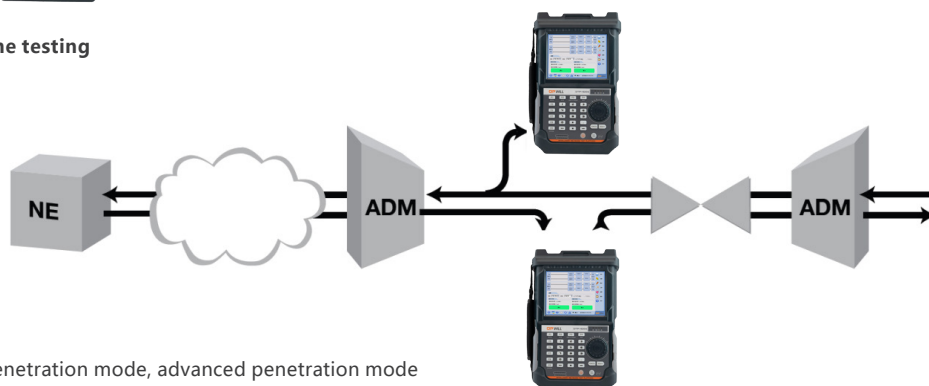
OTN/SDH/Ethernet

- End to end error free transmission verification;
- Automatic protection switching verification;
- SDH/SONET mapping verification;
- Network performance verification.

Loop delay test



Online testing



- Penetration mode, advanced penetration mode
- Online monitoring and protection nodes and optical splitters
- Cost monitoring and decoding
- Pointer monitoring
- Network online business scanning

5. MTS1000+MTS1010 10G OTN/SDH Transmission Analyzer

MTS1000+MTS1010 10G Multi Service Transmission Analyzer, crafted by OPWILL, a leading communication testing solution provider in the industry, is a multifunctional testing device designed specifically for modern complex communication environments. This analyzer integrates a dual port design, supporting comprehensive testing capabilities for various communication protocols such as PDH/SDH/OTN/Ethernet in the speed range of 2M to 10G. At the same time, it keeps up with the forefront of technology and is compatible with and supports the latest OTU0, OSU, and fgOTN testing standards.

The launch of MTS1000+MTS1010 10G multi service transmission analyzer not only improves the performance standards of communication testing equipment, but also brings significant benefits to the entire communication industry. For device manufacturers, it helps ensure the high quality and stability of their products; For telecom operators, it improves the efficiency of network operation and reduces operating costs; For private network service providers, it ensures the high reliability and security of the private network.

The MTS1000+MTS1010 10G multi service transmission analyzer, with its powerful testing capabilities, user-friendly interface, wide range of application scenarios, and profound impact on the industry, is gradually becoming an important force in promoting the sustainable development of communication technology.



Function Features

- The instrument is equipped with a 10 inch high-definition display screen, which is clear, bright, and easy to read. Even in complex or noisy environments, it can ensure that test data and images are clear at a glance, providing users with an unparalleled visual experience.
- Equipped with Linux operating system, the system is stable and reliable, with a simple and intuitive interface. Even first-time users can quickly get started, easily complete testing settings and operations, greatly improving work efficiency.
- The shell made of high-strength materials has excellent protective performance, and can handle harsh working environments such as extreme cold, heat, humidity, and vibration with ease. Through rigorous quality testing, we ensure that the equipment can operate stably and reliably for a long time.
- Integrating multiple transmission and data technologies such as OTN, fgOTN/OSU, M-OTN, SDH, SONET, Ethernet, PDH, DSn, etc., supporting simultaneous testing of multiple services and ports to meet complex and changing testing needs. The real-time data analysis and report generation functions have further improved the efficiency and accuracy of testing work.
- Equipped with multiple communication methods such as GPS, WiFi, and Bluetooth, it provides users with a more flexible and convenient way of testing and data transmission. The GPS function can accurately locate the testing location, facilitating subsequent data analysis and network planning; WiFi and Bluetooth support wireless connections, facilitating fast data transmission and remote collaboration.

Ethernet:

- Two 10G Base-X test interfaces, dual port 10G WAN/LAN test interfaces
- Two 10/100/1000M Base-T, 100M Base FX, and 1000M Base-X test ports, supporting full duplex and half duplex adaptation for all interfaces.
- According to the RFC 2544 standard, perform throughput, back-to-back, latency, and frame loss measurements (bidirectional results);
- Complete Y.1564 test kit (bidirectional results). Y. 1564 can provide comprehensive on-site testing for mobile return and commercial services;
- Support TCP throughput testing function based on RFC6349 standard;
- Support online business scanning based on destination/source MAC, destination/source IP, 3-layer VLAN ID, and 3-layer MPLS Label;
- Up to 512 data streams are generated and analyzed, providing throughput, latency, frame loss, and packet jitter measurements for each data stream;
- Support packet jitter testing based on RFC3393 standard to evaluate changes in IP packet delay
- Support advanced PING testing function for specifying IP address pools
- Error code, loopback, and remote intelligent loopback testing from Layer1 to Layer4;
- Conduct penetration testing and insert network damage during the penetration process to verify network performance;
- Service interruption testing.

5. MTS1000+MTS1010 10G OTN/SDH Transmission Analyzer

Function Features

OTN

- Compliant with ITU-T G.709 and G.sup43 standards
- Two OTU0, OTU1, OTU2, OTU1e, and OTU2e interface tests
- The OTU0 interface meets the definition of OTU0 in ITU-T G.709 and China Mobile Communications Enterprise Standard "Technical Specification for Customer Side Optical Transport Network (CPE OTN) Equipment"
- OTU0 meets the following mapping structure of ITU-T G.709 and China Mobile Communications Enterprise Standard "Technical Specification for Customer Side Optical Transport Network (CPE OTN) Equipment":
 - PRBS->BMP->OPU0->OTU0
 - STM-1->GMP->OPU0->OTU0
 - STM-4->GMP->OPU0->OTU0
 - GE->GFP-T->GMP->OPU0->OTU0
 - MAC (up to 10G speed) ->GFP-F->BMP->OPU0->OTU0
- Synchronous or asynchronous mapping of SDH/SONET signals
- Error insertion and alarm generation of OTU, ODU, OPU
- Monitoring and control of overhead bytes for OTU, ODU, and OPU
- APS automatic protection switching time measurement
- Loop delay testing function

OSU version 00

- Two OTU0, OTU1, OTU2, OTU2e test interfaces, using SFP+physical interface type
- Compliant with the testing requirements of China Unicom Group's enterprise standard 'Technical Requirements for Optical Transport Network (OTN) Equipment Based on Optical Service Units (OSUs) of China Unicom'
- OSU cost editing (excluding non editable bytes and bits) and monitoring
- OSU error insertion and monitoring, OSU alarm insertion and monitoring
- Support insertion and monitoring of OSU layer errors, including the following OSU layer errors: CRC, TCMBIP8, PMBIP8
- Support insertion and monitoring of OSU layer alarms, including the following OSU layer alarms: LOF LOM, TCMLOM, TCMBDI, TCMLTC, PMLOM, PMBDI, LOPB, AIS, OCI, LCK ;

Function Feature

OSU version 00

- Supports OSU bidirectional delay testing function, with a delay testing range of 0-1s and a delay testing accuracy of 0.01ms
- Support OSU lossless bandwidth adjustment testing function, support setting of default bandwidth, adjusted bandwidth, and time, and support fault simulation based on No_SW-INc_Ack, No_SW-Dec-Ack, No_SW-INc_Confirm-Ack, Has_SW-INc_Ack to work on the sink end; The testing function of simulating the effect of the fault on the source end for No_SW-INc_Confirm_Seq.
- OSU version 00 mapping reuse structure
 - OTU0<-ODU0<-OSU<- ETH,CBR
 - OTU1<-ODU1<-OSU<- ETH,CBR
 - OTU2<-ODU2<-OSU<- ETH,CBR
 - OTU2e<-ODU2e<-OSU<- ETH,CBR
 - ODUflex.ts (N*1.25G) <-OSU<- ETH,CBR

OSU version 01

- Two OTU0, OTU1, OTU2, OTU2e test interfaces, using SFP+physical interface type
- Compliant with the testing requirements of China Telecom Group's enterprise standard 'Technical Requirements for M-OTN Equipment in China Telecom Metropolitan Area'
- OSU cost editing (excluding non editable bytes and bits) and monitoring
- Support insertion and monitoring of OSU layer errors, including the following OSU layer errors: CRC TCM1BIP8, TCM1BEI, TCM2BIP8, TCM2BEI, PMBIP8, PMBEI;
- Support insertion and monitoring of OSU layer alarms, including the following OSU layer alarms: LOF LOM, TCM1LOM, TCM1BDI, TCM1LTC, TCM2LOM, TCM2BDI, TCM2LTC, PMLOM, PMBDI, LOPB, AIS, OCI, LCK;
- Supports OSU bidirectional delay testing function, with a delay testing range of 0-1s and a delay testing accuracy of 0.01ms
- Support OSU lossless bandwidth adjustment testing function, support setting of default bandwidth, adjusted bandwidth, and time, and support fault simulation based on No_SW-INc_Ack, No_SW-Dec-Ack, No_SW-INc_Confirm-Ack, Has_SW-INc_Ack to work on the sink end; The testing function of simulating the effect of the fault on the source end for No_SW-INc_Confirm_Seq.
- OSU Version 01 Mapping Reuse Structure
 - OTU0<-ODU0<-OSU<-PRBS, ETH, CBR
 - OTU1<-ODU1<-OSU<-PRBS, ETH, CBR
 - OTU2<-ODU2<-OSU<-PRBS, ETH, CBR
 - OTU2e<-ODU2e<-OSU<-PRBS, ETH, CBR
 - ODUflex.ts (N * 1.25G) <- OSU<- PRBS, ETH, CBR

5. MTS1000+MTS1010 10G OTN/SDH Transmission Analyzer

Function Features

SDH/SONET

- Two STM-1/STM-4/STM-16/STM-64 and OC-3/OC-12/OC-48/OC-192 optical port tests;
- Support mapping and demapping from VC4-64c/STS-192c to VC11/VC12 and VC1.5/VT2;
- Control and decoding of SDH/SONET overhead;
- Pointer monitoring and adjustment, generation of G.783 pointer test sequence;
- Automatic protection switching time measurement;
- Loop delay testing function.

PDH/DSn

- Support DSn/PDH testing function for dual port DS1/DS3, E1/E2/E3/E4 interfaces
- Supports 120 ohm E1 testing function with 2 RJ48 interfaces
- PDH/DSn bit error testing and performance analysis
- Automatic protection switching time test
- Loop delay testing function
- Support error performance testing based on ITU-T G.821, G.826, G.828, and M.2100 standards

Application

- OTN/SDH/SONET on-site installation, debugging, and service activation;
- DSn/PDH to SONET/SDH testing, up to OC-192/STM-64;
- Online testing, offline testing, loop back delay testing, protection switching testing;
- 10/100/100MBase-T, 100/1000MBase-X, and 10GE (LAN/WAN) BERT, RFC2544, Y.1564, and RFC6349 testing;
- Grouping network performance testing, network design testing.

6. OTP6200+OTM2620 40G/100G Transmission Analyzer

OTP6200+OTM2620 40G/100G Transmission Analyzer is a 40G/100G ultra high speed testing solution launched by OPWILL. The OTP6200+OTM2620 40G/100G Analyzer launched by OPWILL can meet the high reliability testing requirements of 40GE/100GE and OTU3/OTU4 high-speed networks for rapid implementation in today's core and metropolitan area networks. The OTM2620 40G/100G testing module is suitable for the OPWILL OTP6200v2 intelligent network testing platform.

High Lights

- CFP interface for 100GE and OTU4 Applications;
- QSFP28+ interface support with CFP-to-QSFP28+ and CFP-to-QSFP+ adapters;
- QSFP+ interface for 40GE and OTU3E1/OTU3E2/OTU3 Applications;
- External clock interface;
- 200ppm clock offset generation;
- Eye diagram reference clock output;
- Soft LED indicators.

Function Feature

Ethernet Testing:

- 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 and Throughput testing at Layer1 to Layer 4;
- 100G/40G packet capture with OPWILL Capture Software decode;
- Error Injection and Alarm Generation.



6. OTP6200+OTM2620 40G/100G Transmission Analyzer

Function Feature

OTN Testing :

- OTN testing for OTU4/OTU3E1/OTU3E2/OTU3;
- Complete multi-stage Mapping/Multiplexing;
- Ethernet/SDH over OTN;
- Service Disruption Measurements;
- Overhead monitoring and byte decoding;
- Error Injection and Alarm Generation;
- Terminate and Through test modes;
- External clock reference interface;
- Eye diagram reference interface.

CFP Testing:

- Optical Lane BERT;
- PCS layer 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/40G data stream generation and analysis.

7. MTS1000+MTS1110 100G Optical Transmission Analyzer

The MTS1000+MTS1110 100G multi-service transmission analyzer, created by OPWILL, a leading provider of communication test solutions, is a versatile test device designed for modern complex communication environments. The analyzer integrates a dual-port design to support full test capabilities for multiple communication protocols such as SDH/OTN/Ethernet at rates ranging from 10G to 100G, while staying on the cutting edge and supporting the latest OSU and fgOTN test standards.

The introduction of the MTS1000+MTS1110 100G multi-service transmission analyzer not only improves the performance standards of communication test equipment, but also brings significant benefits to the entire communication industry. For equipment manufacturers, it helps ensure the high quality and stability of products; For telecom operators, it improves the efficiency of network operation and maintenance and reduces the operating cost. For private network service providers, it ensures the high reliability and security of private networks.

MTS1000+MTS1110 100G multi-service transmission analyzer with its powerful test function, friendly user interface, a wide range of application scenarios and far-reaching impact on the industry, is gradually becoming an important force to promote the sustainable development of communication technology.

Function Feature

- The instrument is equipped with a 10-inch HD display that is clear, bright and easy to read, ensuring that test data and images are clear at a glance, even in complex or noisy environments, giving users an unparalleled visual experience.
- The instrument is equipped with Linux operating system, the system is stable and reliable, the operation interface is simple and intuitive, even the first time users can quickly get started, easily complete the test setting and operation, greatly improving work efficiency.

7. MTS1000+MTS1110 100G Optical Transmission Analyzer

Function Feature

- The shell made of high-strength materials has excellent protection performance, whether it is cold or hot summer or wet vibration and other harsh working environment, can cope with freely. After strict quality testing, to ensure that the equipment can run stably and reliably for a long time.
- Integrates OTN, fgOTN/OSU, M-OTN, SDH, SONET, Ethernet and other transmission and data technologies in one, supporting multi-service and multi-port simultaneous testing to meet complex and changing test requirements. Real-time data analysis and report generation capabilities further improve the efficiency and accuracy of test work.
- Built-in GPS, Wi-Fi, Bluetooth and other communication means, providing users with more flexible and convenient test and data transmission methods. The GPS function can accurately locate the test site, which is convenient for subsequent data analysis and network planning; Wi-Fi and Bluetooth support wireless connectivity for fast data transfer and remote collaboration.
- The instrument is equipped with dual-port QSFP28, SFP56, SFP28, SFP+, SFP test interface, as well as two eye map test interface and a clock interface, which can fully meet the test needs of different customers such as equipment manufacturers, operators and other customers. It is a rare test tool in the industry.

OTN

- Complies with ITU-T G.709 standard;
- Supports dual port OTU0, OTU1, OTU1e, OTU2, OTU2e, OTU3, OTU4 mapping structure and FEC function test;
- With PCS/FEC sub-layer test function, PCS/FEC error and alarm insertion and monitoring functions;
- GE/10GE/25GE/40GE/50GE/100GE Ethernet net load RFC2544 standard test function;
- Synchronous or asynchronous mapping of SDH/SONET signals;
- Incorrect OTU, ODU, OPU insertion and alarm generation;
- OTU, ODU, OPU Overhead byte monitoring and control;
- APS Measures the automatic protection switching time;
- Loopback delay test function.

Ethernet

- Based on IEEE 802.3bs and IEEE 802.3ba standards
- Dual-port GE/10G/25G/40G/50G/100G Ethernet test function (Upto 4x100G)
- Throughput, back-to-back, delay, and frame loss measurements according to RFC 2544 (bidirectional results);
- The complete Y.1564 test suite (two-way results). Y.1564 provides comprehensive field testing for mobile backhaul and commercial services;
- Supports TCP throughput test based on RFC6349 standards.
- Online service scanning based on destination/source MAC address, destination/source IP address, Layer 3 VLAN ID, and Layer 3 MPLS Label.
- Up to 512 data streams generated and analyzed, providing throughput, latency, frame loss and packet jitter measurements for each data stream;
- Supports the packet jitter test based on the RFC3393 standard to evaluate IP packet delay changes
- Supports the advanced PING test of the specified IP address pool
- Layer1 to Layer4 bit error, loopback, and remote intelligent loopback tests;
- Through-mode testing, and the ability to insert network damage during the through-through process to verify network performance;
- Service interruption test.

SDH/SONET

- Dual STM-1/STM-4/STM-16/STM-64 and OC-3/OC-12/OC-48/OC-192 optical port tests
- Supports mapping and unmapping from VC4-64c/STS-192c to VC11/VC12 and VC1.5/VT2
- SDH/SONET overhead control and decoding
- Pointer monitoring and adjustment, G.783 pointer test sequence generation
- Automatic protection switching time measurement
- Loopback delay test function

Application

- R&D, manufacturing, installation and maintenance of OTN/SDH core and metropolitan area networks;
- Manufacture, installation and troubleshooting of carrier-grade Ethernet equipment;
- Installation and testing of mobile frontpasses and backpasses;
- BERT, RFC2544 and SLA verification tests;
- 10G/25G/40G/50G/100G Ethernet data stream generation and analysis.

8. MTS1000+MTS1410 Portable 400G Optical Transmission Analyzer

The MTS1000+MTS1410 400G multiservice transmission analyzer, created by OPWILL, a leading provider of communication test solutions, is a versatile test device designed for modern complex communication environments. The analyzer integrates a dual-port design to support full test capabilities for multiple communication protocols such as SDH/OTN/Ethernet at rates ranging from 1G to 400G, while staying on the cutting edge and supporting the latest OSU and fgOTN test standards.

The introduction of the MTS1000+MTS1410 400G multi-service transmission analyzer not only raises the performance standard of communication test equipment, but also brings significant benefits to the entire communication industry. For equipment manufacturers, it helps ensure the high quality and stability of products; For telecom operators, it improves the efficiency of network operation and maintenance and reduces the operating cost. For private network service providers, it ensures the high reliability and security of private networks.

MTS1000+MTS1410 400G multi-service transmission analyzer with its powerful test function, friendly user interface, a wide range of application scenarios and far-reaching impact on the industry, is gradually becoming an important force to promote the sustainable development of communication technology.



Function Feature

- The instrument is equipped with a 10-inch HD display that is clear, bright and easy to read, ensuring that test data and images are clear at a glance, even in complex or noisy environments, giving users an unparalleled visual experience;
- Equipped with Linux operating system, the system is stable and reliable, the operation interface is simple and intuitive, even the first time users can quickly get started, easily complete the test setting and operation, greatly improving work efficiency;

Function Feature

- The shell made of high-strength materials has excellent protection performance, whether it is cold or hot summer or wet vibration and other harsh working environment, can cope with freely. After strict quality testing, to ensure that the equipment can run stably and reliably for a long time;
- Integrates OTN, fgOTN/OSU, M-OTN, SDH, SONET, Ethernet and other transmission and data technologies in one, supporting multi-service and multi-port simultaneous testing to meet complex and changing test requirements. Real-time data analysis and report generation capabilities further improve the efficiency and accuracy of test work;
- Built-in GPS, Wi-Fi, Bluetooth and other communication means, providing users with more flexible and convenient test and data transmission methods. The GPS function can accurately locate the test site, which is convenient for subsequent data analysis and network planning; Wi-Fi and Bluetooth support wireless connectivity for fast data transfer and remote collaboration;
- Equipped with dual-port QSFP-DD, QSFP28, SFP56, SFP28, SFP+, SFP test interface, as well as two eye map test interface and a receiving and transmitting clock interface, fully meet the testing needs of different customers such as equipment manufacturers, operators and other customers, is a rare test tool in the industry.

High-speed optical module test:

- Supports 16 x 25Gb/s, 4 x 50Gb/s, and 8 x 50Gb/s I/O electrical interfaces;
- Supports 8 x 50G QSFP-DD interfaces, as well as QSFP28,SFP56,SFP28,SFP+ interfaces;
- Displays the total power of the port and the power of the laser in a single physical channel. The power accuracy is 0.5dBm;
- You can disable the port laser. For multi-channel interfaces, you can disable the lasers in all channels at the same time or in a single channel;
- Monitors the power supply current, power consumption, and temperature of the QSFP-DD module in real time, and calculates the corresponding peak value and occurrence time;
- Supports QSFP28/ QSFP-DD module debugging and module status management;
- Support optical module register editing and detection; And the optical module register read and write time can be set;
- Insert and monitor bit error/alarm at PHY layer and PCS layer of optical module.

Ethernet test:

- Dual-port 400G/200G Ethernet traffic generation and analysis;
- Dual-port 100G Ethernet traffic generation and analysis, two 100G (Upto 4x100G) ports can be independently allocated to different users for configuration and testing;
- Dual-port 50G/25G/10G Ethernet traffic generation and analysis;
- With PCS/FEC sub-layer test function, PCS/FEC error and alarm insertion and monitoring functions;
- Supports the frequency offset test and display of the receiving end signal based on each physical wavelength channel. Supports the function of setting the frequency offset of the sending end, the setting range is greater than (+/-)200ppm, and the minimum step is set to 0.01ppm;

8. MTS1000+MTS1410 Portable 400G Optical Transmission Analyzer

Function Feature

Ethernet test:

- RFC2544 test. The uplink and downlink rates of the RFC2544 are inconsistent. The delay accuracy must reach 1ns;
- Automatic protection switching (APS)/service interruption time This test is performed automatically. The time test accuracy is 1ns;
- Supports one-way high-precision delay test based on GPS or Beidou Tamed, with a test accuracy of 100ns;
- Supports the high-precision packet jitter test between Ethernet packets with an accuracy greater than 100ns;
- Supports Ethernet statistics and traffic control;
- Provides the functions of code error and alarm insertion and monitoring;
- Supports Layer 1 to Layer 3 bit error, loopback, intelligent loopback, and punch;
- Support 512 data stream generation and analysis and other test functions;
- Supports IPV4,IPV6, Layer 3 VLAN, Layer 3 MPLS, and MPLS-TP Label;
- The Ethernet frame length can be edited, and the length must be 50 to 16K.

FlexE Test:

- Conforms to the Flex Ethernet frame structure defined by OIF-FLEXE-1.0/2.0;
- Supports two frames at 103Gb/s (FlexE), Supports 1x100GE, 2x100GE, 4x100GE various bundled bandwidth physical interfaces or 40x10GE to two 100G QSFP28 physical interfaces and multiple 10GE, 25GE, 40GE, 50GE and 100GE mixed binding of not less than a maximum of 200G physical bandwidth, supporting different customer service particles (Nx5G, NX5G, NX5G, NX5G, NX5G, NX5G, QSFP28) 10GE, 25GE, 40GE, 50GE, 75G, 100GE, 200GE) can be flexibly distributed to different physical interfaces through 5G time slots;
- Supports three typical FlexE implementations: Ethernet physical layer rate binding, Ethernet physical layer rate, and channeled rate applications bound to a single physical medium or multiple physical layer interfaces;
- The length of each customer Ethernet Mac frame on FlexE can be edited. The frame length must be 50 to 16K;
- Supports automated throughput testing for each customer Ethernet in FlexE;
- Analyzes, collects statistics, and displays packet lengths at the MAC layer of any branch of FlexE;
- Supports high-precision delay testing for all customer load Ethernet rate services in FlexE with an accuracy of better than 100ns;
- Supports all customer load Ethernet rate particle service QoS tests in FlexE, including the generation and evaluation of each customer service, and real-time statistics and analysis of throughput, packet loss, packet duplication, packet sequence error, packet verification error, and delay;

Function Feature

FlexE Test:

- Supports FlexE bit error analysis tests, and allows you to insert and detect alarms, configuration alarms, and bit errors;
- Automatic protection switchover (APS)/service interruption time of each FlexE can be automatically tested with a time test accuracy of 1ns;
- Supports the frequency offset test and display of the receiving end signal based on each physical wavelength channel;
- Support FEC sublayer test function, support IEEE802.3ba 100GBASE-R standard FEC RS (528, 514);
- Supports MLD sublayer testing, content can be edited and monitored.

OTUCn/FlexO Test:

- Supports four speeds of 111.809Gb/s (FOIC1.4);
- Supports four speeds of 111.809Gb/s (FOIC1.2);
- Supports 1 speed of 447.237Gb/s (FOIC4.8);
- OTUCn, OTU4, FlexO Frame structure overhead can be edited (except for non-editable overhead) and monitored;
- The test signal structure (TSS) in ITU-T 0.182, the PRBS of the test signal support at least 223-1/231-1 (ITU-type and reverse transformation), etc;
- Has the ability to edit and display the Group ID and PHY ID of each FlexO interface at the sending end and receive synchronously, and can set the receive reference values separately;
- Has the ability to generate OTUCn (1 ~ 4) per OTUC overhead byte sequence;
- Supports typical mapping and reuse architectures associated with ITU G.709(June 2020 version) and G.709.1 FlexO (June 2018 version) and OTUCn(1-4) : For the mapping multiplexing structure of OTUCn(1-4), the mapping of the highest OTUCn(1-4) to FlexO interface is supported, and the multiplexing of mainstream ODUflex to OPUCn(1-4) is supported;
- The mapping multiplexing structure of ODUflex to ODU4 shall support the mapping adaptation and testing function of ODUflex rate particles to OPUC4 based on 5G timeslot of 1 ~ 80×5G TS bandwidth defined by ITU;
- Support FlexO,FEC,OTUCn, ODUCn, OPUCn error insertion and monitoring;
- Has the performance monitoring capability of ITU-T G.8201, assessing EB, BBE, ES, EFS, SES and UAS;
- Supports FlexO,FEC, port, OTUCn, ODUCn, and OPUCn alarm insertion and monitoring;
- Supports latency test on FlexO/OTUCn(1 to 4) service interfaces. The latency test ranges from 0 to 5s. The test accuracy of delay is 1ns;
- Allows FlexO to set and monitor the relative latency between physical ports with a latency test accuracy of 0.01ns. The minimum granularity of delay loading is 1bit;
- Supports the relative delay setting and monitoring of multiple parallel channels inside each physical port of FlexO, as well as the selection of loading channels. The delay test accuracy is 0.1ns, and the minimum granularity of multi-channel delay loading on each physical port is 1bit;

8. MTS1000+MTS1410 Portable 400G Optical Transmission Analyzer

Function Feature

OTUCn/FlexO Test:

- Each FlexO/OTUCn(1~4) interface of the receiving end supports frequency offset testing and display function based on 28G/56G channel of each physical wavelength; Support the setting function of the frequency offset of the sending end, the setting range is (+/-)200ppm, and the minimum step size is set to 0.01ppm;
- Automatic protection switching (APS)/Service interruption time FlexO/OTUCn(1 to 4) is automatically tested with a time test accuracy of 1ns;
- Support FEC test function, support G.709.1 standard FEC RS KP4 (544, 514) and G.UP58 standard FEC RS(255.239) two ways;
- Supports the G.7044 OTU Flex lossless adjustment test.

Other tests:

- Supports timing modes such as internal clock, external clock, and line extraction clock;
- The external input clock must support at least 1pps, 2.048Mbit/s, 2.048MHz, and 1.544MHz. Adopts SMA interface;
- The output clock supports at least 2.048Mbit/s, 2.048MHz, 1.544MHz, and 1pps. SMA interface;
- The internal clock accuracy of the instrument reaches +/-4.6ppm;
- Supports a variety of data saving formats, including EXCEL, PDF, TXT, CSV and pictures, and can copy and save the screen;
- With GPS SMA interface, built-in high precision crystal oscillator;
- Automatic test interface, support to query the automatic interface usage, support exclusive or replace two modes;
- The instrument provides internal debug information or internal logs, facilitating fault location and resolution.

Application

- High-speed 400G transmission equipment R & D test, production line test, optical module verification test;
- R&D, manufacturing, installation and maintenance of OTN/SDH core and metropolitan area networks;
- Manufacture, installation and troubleshooting of carrier-grade Ethernet equipment;
- Installation and testing of mobile frontpasses and backpasses;
- BERT, RFC2544 and SLA verification tests;
- 40G/10G/25G/50G/100G/200G/400G Ethernet generation and analysis of data flow.

9. MTP1000+MTS1400 400G Multi Service Tester

The MTS1000+MTS1400 400G optical transmission analyzer consists of the MTP1000 multifunctional testing platform and the MTS1400 400G multi service testing module.



MTP1000 Multi functional Testing Platform

MTP1000 is a high-performance 4U rack mounted multifunctional testing platform which designed to meet a wide range of testing needs. This platform supports the simultaneous insertion of up to two 10G to 400G high-speed testing modules and two 2M to 10G rate modules, demonstrating its unparalleled multi module compatibility and flexibility, making it easy to handle various testing scenarios from basic to high-end.

MTP1000 is equipped with a 6.5-inch high-definition touch screen display, providing an intuitive and smooth interactive experience, making operation more convenient and efficient. Combined with a powerful user interface, users can easily get started and achieve complex testing tasks and precise control.

The MTP1000 platform integrates multiple communication technologies such as USB 3.0, USB 2.0, Gigabit Ethernet interface, WIFI, and Bluetooth to ensure high-speed, stable, and flexible data transmission, meeting diverse testing and connection requirements.

MTP1000 uses the Linux operating system, which not only supports Python based automated testing scripts, but also has powerful optical communication, transmission, data, and synchronous testing module expansion capabilities, providing users with a wide range of testing options to ensure that every test can be precise and efficient, meeting strict testing standards in the industry.

The MTP1000 multifunctional testing platform has become a leader in the testing field due to its excellent compatibility, flexible scalability, intuitive interaction experience, and diverse communication methods. It is suitable for comprehensive testing and verification of various communication and network devices, and is an ideal choice to improve testing efficiency and ensure product quality.

9. MTP1000+MTS1400 400G Multi Service Tester

MTS1400 400G Multi Service Testing Module

The MTS1400 400G multi service transmission analysis module, crafted by OPWILL, a leading communication testing solution provider in the industry, is a multifunctional testing equipment designed specifically for modern complex communication environments. This analyzer integrates a dual port design, supporting comprehensive testing capabilities for various communication protocols such as SDH/OTN/Ethernet in the speed range of 10G to 400G. At the same time, it keeps up with the forefront of technology and is compatible with and supports the latest OSU and fgOTN testing standards.

The launch of the MTS1400 400G multi service transmission analysis module not only improves the performance standards of communication testing equipment, but also brings significant benefits to the entire communication industry. For device manufacturers, it helps ensure the high quality and stability of their products; For telecom operators, it improves the efficiency of network operation and reduces operating costs; For private network service providers, it ensures the high reliability and security of the private network.

Function Feature

High speed optical module testing:

- Supports 16 × 25Gb/s, 4 × 50Gb/s, and 8 × 50Gb/s I/O electrical interfaces.
- Supports 8 × 50G QSFP-DD or 8 × 50G PAM-4 OSFP or 8 × 50G PAM-4 CFP2 interfaces, as well as QSFP28, SFP56, SFP28, SFP+ interfaces, etc.
- Support displaying the total power of the port and the power of a single physical channel laser; The power accuracy is 0.5dBm.
- Support turning off port lasers. For multi-channel interfaces, support turning off all channel lasers simultaneously, and support turning off a single channel laser.
- Support 16x25G bit error generation and testing function, each channel can independently set pattern patterns for independent testing, and each 25G independent user can customize and edit the corresponding code pattern
- Support real-time monitoring of power supply current, power consumption, and temperature for QSFP-DD, OSFP, or CFP2 modules, and can perform statistical functions for corresponding peak values and corresponding occurrence times.
- Support QSFP28/QSFP-DD/OSFP/CFP2-DCO module debugging function, and support module status management;
- Support editing and detection of optical module registers; And the read and write time of the optical module register can be set;
- Support the insertion and monitoring of errors/alarms in the PHY layer and PCS layer of the optical module;

Ethernet testing:

- Single port 400G/200G Ethernet traffic generation and analysis;
- Generate and analyze Ethernet traffic with four 100G ports, which can be independently assigned to different users for configuration and testing;
- Generation and analysis of Ethernet traffic for dual port 50G/25G/10G/1G;
- Capable of testing PCS/FEC sub layers, inserting and monitoring PCS/FEC errors and alarms, etc;
- Support frequency offset testing and display function based on each physical wavelength channel of the receiving end signal. Support the setting function of frequency offset at the sending end, with a setting range greater than (+/-) 200ppm and a minimum step size of 0.01ppm
- RFC2544 testing function, RFC2544 upstream and downstream rate inconsistency testing function, with a latency accuracy requirement of 1ns;
- Automatic protection switching (APS)/service interruption time testing for Ethernet services, with a time testing accuracy of 1ns
- Support one-way high-precision delay testing function based on GPS or Beidou timing, with a testing accuracy of 100ns.
- Support high-precision packet jitter testing between Ethernet packets, with an accuracy of better than 100ns.
- Supports Ethernet information statistics, flow control, and other functions
- Capable of inserting and monitoring errors and alarms;
- Support layer 1 to layer 3 bit errors, loopback, intelligent loopback, and pass through;
- Support testing functions such as generating and analyzing 512 data streams;
- Supports IPV4, IPV6, 3-layer VLAN, 3-layer MPLS, and MPLS-TP Label;
- The Ethernet frame length can be edited, and the length setting needs to meet 50-16K;

FlexE testing:

- Meet the Flex Ethernet frame structure defined by OIF-FLEXE-1.0/2.0.
- Supports 4 frames with a speed of 103Gb/s (FlexE), and can support various bundled bandwidth physical interfaces such as 1x100GE, 2x100GE, 3x100GE, 4x100GE, or 40x10GE to 4 100G QSFP28 physical interfaces, as well as multiple 10GE, 25GE, 40GE, and 50GE and 100GE mixed bindings with a maximum physical bandwidth of no less than 400G. It supports flexible distribution of different customer business particles (Nx5G, 10GE, 25GE, 40GE, 50GE, 75G, 100GE, 200GE, or 400GE) to different physical interfaces through 5G time slots;
- Supports three typical implementations of FlexE, including Ethernet physical layer rate binding, Ethernet physical layer sub rate, and channelized rate applications bound to a single physical medium or multiple physical layer interfaces.
- Supports editable Ethernet Mac frame length for each customer in FlexE, with a length setting of 50-16K;
- Support automatic testing of Ethernet throughput for each customer in FlexE.
- Support the analysis, statistics, and display functions of different packet lengths at any branch Ethernet MAC layer in FlexE.
- Supports high-precision delay testing for all customer load Ethernet rate services in FlexE, with testing accuracy better than 100ns.

9. MTP1000+MTS1400 400G Multi Service Tester

FlexE testing:

- Support all customer load Ethernet rate granular service QoS testing in FlexE, with support for generating and evaluating each customer service, real-time statistics and analysis of throughput, packet loss, duplicate packets, out of order packets, packet checksum errors, and latency.
- Support error performance analysis and testing for FlexE, including insertion and detection of alarms, configuration alarms, and errors
- Support automatic protection switching (APS)/business interruption time testing for each FlexE, with a time testing accuracy of 1ns
- Support frequency offset testing and display function based on each physical wavelength channel of the receiving end signal.
- Support FEC sublayer testing function, support IEEE802.3ba 100GBASE-R standard FEC RS (528, 514)
- Support MLD sub layer testing, content can be edited and monitored
- Support SHIM sub layer testing, content can be edited and monitored

OTUCn/FlexO testing:

- Supports 4 speeds of 111.809Gb/s (FOIC1.4) using QSFP28 interface
- Supports 4 speeds of 111.809Gb/s (FOIC1.2) using QSFP28 interface
- Supports a speed of 447.237Gb/s (FOIC4.8) and uses one QSFP-DD interface.
- OTUCn, OTU4, FLEXO frame structure overhead can be edited (excluding non editable overhead) and monitored
- The test signal structure (TSS) in ITU-T 0.182, the PRBS of the test signal should support at least 223-1/231-1 (ITU type and inverted type), etc
- The sending end has the ability to edit and receive synchronized display of Group ID and PHY ID for each FlexO interface, and can set receiving reference values separately
- Capable of generating overhead byte sequences for each OTUCn (1-4)
- Supports ITU G.709 (June 2020 version) and G Typical mapping and multiplexing structures related to FlexO (June 2018 version) and OTUCn (1-4): For the mapping multiplexing structure of OTUCn (1-4), it supports mapping from the highest OTUCn (1-4) to the FlexO interface, and supports multiplexing from mainstream ODUflex to OPUCN (1-4).
- For the mapping and multiplexing structure from ODUflex to ODU4, it should support the mapping adaptation and testing function from ODUflex rate granules based on 5G time slots with $1-80 \times 5G$ TS bandwidth defined by ITU standards to OPUC4;
- Support error insertion and monitoring for FlexO, FEC, OTUCn, ODU4, and OPUCN;

OTUCn/FlexO testing:

- Capable of performance monitoring according to ITU-T G.8201, evaluating EB, BBE, ES, EFS, SES, and UAS.
- Support delay testing function for FlexO/OTUCn (1-4) business interfaces, with a delay testing range of 0-5s; The testing accuracy of latency is 1ns;
- Support relative delay setting and monitoring function between FlexO physical ports, with a delay testing accuracy of 0.01ns; The minimum granularity for delayed loading is 1 bit;
- Support the relative delay setting and monitoring function of multiple parallel channels within each physical port of FlexO, as well as the selection function of loading channels. The delay testing accuracy is 0.1ns, and the minimum granularity of multi-channel delay loading for each physical port is 1-bit;
- Each FlexO/OTUCn (1-4) interface that supports receiving signals has frequency offset testing and display functionality based on each physical wavelength 28G/56G channel; Support the setting function of frequency offset at the sending end, with a setting range of (+/-) 200ppm and a minimum step size of 0.01ppm
- Support automatic protection switching (APS)/business interruption time testing for FlexO/OTUCn (1-4) services, with a time testing accuracy of 1ns.
- Supports FEC testing function, supporting two types of FEC RS: G.709.1 standard FEC RS KP4 (544, 514) and G.sup58 standard FEC RS (255.239);
- Support G.7044 OTU Flex non-destructive adjustment testing function

Other tests:

- Support timing methods such as internal clock, external clock, and line extraction clock;
- The external input clock should support at least 1pps, 2.048Mbit/s, 2.048MHz, 1.544MHz, etc; Adopting SMA interface;
- Output external clock that supports at least 2.048Mbit/s, 2.048MHz, 1.544MHz, 1pps, etc; Adopting SMA interface
- The internal clock accuracy of the instrument reaches+/-4.6ppm;
- Supports multiple data storage formats, including EXCEL, PDF, TXT, CSV, and images, and can copy and save the screen;
- Equipped with GPS SMA interface and built-in high-precision crystal oscillator;
- Automated testing interface, supports querying the occupancy status of automated interfaces, and supports two modes: exclusive or replacement;
- The instrument has internal debug information or internal logs for easy identification and resolution of problems.

Application

- Research and development testing of high-speed 400G transmission equipment, production line testing, and optical module verification testing
- Research and development, manufacturing, installation, and maintenance of OTN/SDH core networks and metropolitan area networks;
- Manufacturing, installation, and troubleshooting of telecommunications grade Ethernet equipment;
- Installation and testing of mobile front and back transmission;
- BERT, RFC2544, and SLA validation testing;
- Generation and analysis of 10G/25G/40G/50G/100/200/400G Ethernet data streams.

1. OTP6200+OTM2800 Synchronization Analyzer

OTM2800 Synchronization Analyzer is specially designed for conducting clock synchronization of PTN or Packet Ethernet, which is developed and manufactured by OPWILL. It is developed in accordance with IEEE1588v2, SYNC-E, 1PPS+ToD, Ethernet, and E1 such standards, provides a complete clock synchronization test solution for operators. This module is compatible with OTP6200v2 (OPWILL Intelligent Network Test Platform).

Feature

- Support 1588v2, SYNC-E, 1PPS+ToD, and TDM;
- Integrated a rubidium atomic GPS clock, which can keep GPS time signal for 2 hours, beneficial for some situation where is inconvenient for setting GPS antenna;
- Support to reproduce UTC time and clock with high precision;
- Support to test IEEE1588v2 time server, IP RAN/PTN/OTN/xPON infrastructures, and BS time synchronization precision and performance;
- Support 1PPS+ToD, IEEE1588v2 PTP and SYNC-E mask and slave emulation testing.
- Support ESMC simulation and analysis, which is in accordance with ITU-T G.8264 standard;
- Support to conduct 7X24 continuous test to analyse drift performance in a long term situation for time and clock synchronization;
- Support to calculate MTIE, TDEV.



Application

- Network planning test;
- Synchronization service open, maintain, and troubleshoot;
- PTN network performance test.



2. OTP6200+OTM2810 10G Synchronization Analyzer

With the rapid development of 5G networks, more and more domestic and foreign operators are adopting IEEE1588v2 PTP based on 10GE interface for time and clock synchronization. This requires testing of time and clock using a time analyzer based on a 10GE interface.

The OTP6200+OTM2810 10GE Sync analyzer is equipped with GPS and Beidou second-generation tamed atomic clock, providing high-precision time clock information. It can support the verification and calibration of traditional TDM and SDH network timing technologies, as well as the latest operational Ethernet timing technologies such as SyncE, 1PPS+ToD, and GE/10GE IEEE1588v2 PTP. Provide efficient, high-precision, and comprehensive time and clock performance analysis and testing for 2G/3G/4G/5G synchronous networks of power systems, railway systems, military communication networks. and operators.



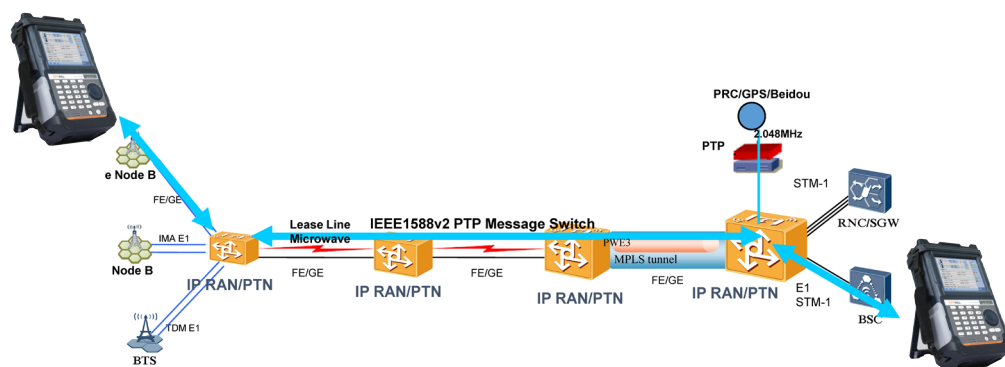
Function feature

- Integrated with traditional TDM clock measurement, SDH clock measurement, 1PPS/PP2S, 1PPS+ToD, NTP/SNTP, SyncE, and IEEE1588v2 PTP operator grade Ethernet timing testing functions;
- Built in GPS and Beidou second-generation tamed atomic clock, capable of maintaining at least 2 hours of time retention;
- 10M to 10G Ethernet testing function, supporting bit error rate, throughput RFC2544, RFC3393, Loop and other testing functions.

2. OTP6200+OTM2810 10G Synchronization Analyzer

Time and clock testing

- Built in precision timing GPS and Beidou II, as well as GPS and Beidou II tamed rubidium or atomic clocks, can reproduce high-precision UTC time and generate high-precision clocks as testing benchmarks;
- Precision measurement of time synchronization accuracy and performance of transmission equipment such as IEEE1588v2 time server, OTN/STN/SPN, and base station equipment, including 1PPS+TOD interface and IEEE1588v2 PTP interface;
- Precision measurement of clock synchronization accuracy and performance based on IEEE1588v2/1PPS+TOD clock synchronization system or SyncE clock synchronization system;
- The atomic clock tamed by GPS and Beidou II can maintain a time of 2 hours, suitable for scenarios such as computer rooms in basements where it is inconvenient to install GPS antennas;
- Dual port 10/100/1000M electrical port, 100M/1000M/10G optical port with IEEE1588v2/SyncE/NTP time and clock Master/Slave simulation testing function. The two ports can work independently and can be used as both Master and Slave, or one can be used as both Master and Slave, supporting IEEE 1588v2 PTP TIE/MTIE/TDEV analysis and testing;
- Support time and clock testing functions for input and output testing interfaces such as 1PPS+TOD, 1PPS/PP2S, 2.048MHz, 2.048Mbps, 10MHz, etc;
- Support the measurement, analysis, and evaluation of time and clock based on the G.811, G.812, G.813, G.823, G.8261, G.8262, G.8265.1, G.8275.1, G.8275.2, G.8273.2, C37.238 series standard specifications;
- Supports IEEE1588v2 Master Clock and Slave Clock (supports one step clock and two step clock), and can automatically exchange IEEE1588v2 master slave messages;
- Support PTP message over Ethernet and PTP message over UDP over IPv4 PTP message mapping;
- Support transmission frequency settings for Sync, Announce, and Delay_Req PTP Messages;
- Support real-time statistics of various sent and received PTP information, including real-time analysis of PTP timestamps (T1, T2, T3, T4) and other information;
- Synchronous OAM testing function;
- Test the function simultaneously with any combination of time and clock;
- Support filtering and directional capture of various types of messages using protocols such as TOD, IEEE1588v2 PTP, SyncE, and NTP/SNTP.



Ethernet Test

- Dual port 10/100/1000M Base-T, 100MBase FX, 1000M Base-X, and 10G Base-X Ethernet test interfaces;
- Support error testing function from Layer1 to Layer4. Support insertion and detection of errors;
- Support generating MAC layer, IP layer, TCP/UDP layer data streams; User defined frame range is 64 to 16000 bytes; It has the function of generating and analyzing multiple data streams, and users can customize 8 different data streams for frame analysis testing;
- Support Ethernet performance testing (RFC2544): throughput, latency, frame loss, back-to-back; Support testing with 7 custom frames;
- Support SLA testing functionality based on Y.1564 standard;
- Support packet jitter testing based on RFC3393 standard, which can generate data streams in three ways: G.711, G.723.1, G.729, and user-defined;
- Support threading and loopback functions;
- Support Ethernet signal alarm, error analysis, and traffic statistics;
- Support service interruption testing function.

Application

- Synchronize network planning testing;
- Synchronization service activation, maintenance, and troubleshooting;
- Online testing, offline testing, loop back delay testing, protection switching testing;
- 10/100/100MBase-T, 100/1000MBase-X, and 10GE (LAN/WAN) BERT, RFC2544, Y.1564, and RFC6349 testing;
- Grouping network performance testing, network design testing.

1. OBERT800 800G BERT Tester

The OBERT 800G error code tester is a high-performance multi-channel and multi rate error code analysis instrument newly developed by OPWILL. This instrument provides eight electrical port channels for error testing, with multiple code types to choose from and user-defined code type settings; Supports NRZ and PAM4 codes. Can be used for the research and production testing of optical devices, active optical cable AOC, optical modules, and communication systems.



Function feature

- Suitable for the testing of optical modules such as CFP,CFP2,CFP4,CFP8,QSFP28,QSFP-56,QSFP-DD,OSFP,SFP56, SFP28,etc.
- Provide eight electrical port channels, each supporting rate settings of 24.8832, 25.0, 25.06752, 25.78125, 26.5625, 27.95, 28.05, 28.125, 28.9, 49.765, 49.7664, 50.0, 50.13504, 51.5625, 53.125, 55.9, 57.8;
- Supports NRZ and PAM4 encoding;
- Supported code types: PRBS7/9/11/13/15/23/31; PRBS7~31Q,SSPRQ;JP03A/03B , Support custom models;
- Advanced FEC testing tool that supports KP4 and KR4 FEC analysis and statistics;
- Support RS-FEC Scrambled Idle code type;
- Channel simulation, insertion of burst/random errors, O-SMPM connection, channel histogram, channel mapping;
- Support transmitter pre emphasis adjustment and receiver equalization adjustment.

Technical Specification

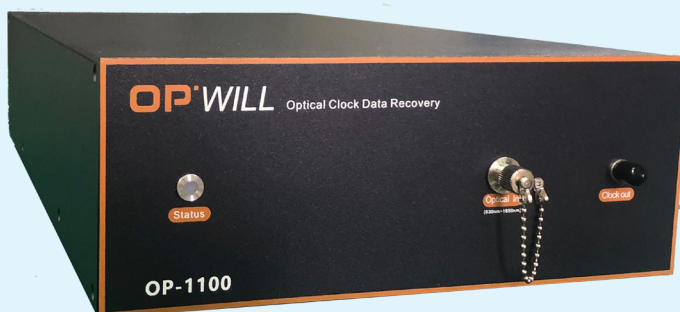
Model	OBERT-800
Number of channels	8
Modulation	NRZ/PAM4
Data rate per channel (GBd)	24.8832、25.0、25.06752、25.78125、26.5625、27.95、28.05、28.125、28.9、49.765、49.7664、50.0、50.13504、51.5625、53.125、55.9、57.8
Range of data rate adjustment (ppm)	0 to ± 300
Output signal amplitude	>600mVpp
PAM4 encoding	Linear code/Gray code
Pattern	PRBS7/9/11/13/15/23/31;PRBS7~31Q,SSPRQ;JP03A/03B, Custom Model
Amplitude(mVppd)	800 f j
Rising edge time/falling edge time (ps)	10/10 e (53.125G) 10/10 c (25.78125G)
PAM4Signal eye width(zero hit)(ps)	5.5 f (53.125G) 23 d (26.5625G)
Jitter RMS(fs)	500 e (53.125G) 450 c (25.78125G)
450 c (25.78125G)	250 h、i (PAM4 53.125G)
Jitter RMS(fs)	500 e (53.125G)
Sensitivity(mVppd) CTLE(dB)	250 h、i (PAM4 53.125G)
Clock output amplitude(mVppd)	400
Clock division ratio	/2、/4、/8、/16、/32、/64 (Clock frequency/symbol rate)
Connector Type	O-SMPM connector (with a maximum bandwidth of 67 GHz)

Application

- Research and production of optical transceiver modules, especially parallel 100G/200G/400G/800G products;
- Research and production of optical devices/subsystems;
- Quality inspection and production of incoming materials from system equipment suppliers;
- Installation and troubleshooting of system equipment.

2. OP1100 Clock Data Recovery(CDR)

The OP1100 clock recovery device is a high-speed clock recovery product independently developed by OPWILL, which supports optical clock recovery at 48~60 GBaud and 24~30 GBaud rates, and assists in high-end optical module optical eye diagram testing for R&D and production ends.



Function feature

- Equipped with FC/PC interface to ensure the reliability and stability of the connection;
- Supports a wide range of customizable speeds: 48~60GBd/24~30GBd, suitable for different testing needs;
- Compatible with PAM4 and NRZ signals, providing wide application flexibility;
- Quick automatic locking;
- Multiple synchronous frequency division clock outputs;
- Provide USB interface and GUI for intuitive and easy operation.

Technical Specification

Model	OP1100
Support Speed	24 ~ 30 GBaud (customizable) 48 ~ 60 GBaud (customizable)
Optical Interface type	FC/PC 50/125 μm
Data format	PAM4/NRZ
Wavelength Range	830 ~ 1650nm
Return Loss	≤ -23dB
Maximum input optical power	7dBm
OMA sensitivity	-10dBm@850nm -15dBm@1310nm
Clock signal interface	2.92 mm(f)
Frequency division ratio	1/4, 1/8 @53.125GBaud PAM4 1/4, 1/8 @26.5625GBaud PAM4
Clock output amplitude	450mV
Restore clock jitter	130fs
loop bandwidth	Default value 4 MHz (adjustable)
Lock the collection range	±1000ppm

Application

- Sensitivity consistency test
- 100G/200G/400G optical module clock recovery

3. OTC2100 Series OTDR Module

OTC2100 Series OTDR Test Module is designed and manufactured by OPWILL, specialised for optical fibre monitoring system. This compact and high performance module was launched due to increasingly demand for online maintaining and monitoring optical fibre system recently.



Function feature

- Specialised for optical fibre monitoring system;
- Working temperature from: -10° C to +60° C;
- Event dead zone 1m, attenuation dead zone 5m;
- Control by computer or server through Ethernet port (Compatible with 10M/100M Ethernet port, set IP address by RS232C);
- Integrated a complete set of control command including configuration, test, data transfer, etc

Application

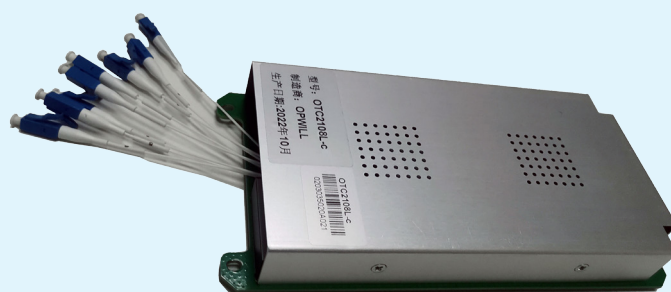
- Installation and maintenance of fiber optic communication system
- Network monitoring of telecommunications operators
- Fiber optic cabling detection for data center connection
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality
- Submarine fiber optic cable monitoring
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments

Technical Specification

Mode	OTC2100S-a	OTC2100S-c	OTC2100S-d
Wavelength (nm)	1310nm	1550nm	1625nm
Dynamic Range (dB)	25dB	25dB	25dB
Mode	OTC2100V-a	OTC2100V-c	OTC2100V-d
Wavelength (nm)	1310 nm	1550 nm	1625nm
Dynamic Range (dB)	28dB	28dB	28dB
Mode	OTC2100L-a	OTC2100L-c	OTC2100L-d
Wavelength (nm)	1310nm	1550nm	1625nm
Dynamic Range (dB)	31dB	31dB	31dB
Mode	OTC2100N-a	OTC2100N-c	OTC2100N-d
Wavelength (nm)	1310 nm	1550 nm	1625nm
Dynamic Range (dB)	34dB	34dB	34dB
Pulse Width (ns)	3 to 20000ns	Event Dead Zone	1.5m
Attenuation Dead Zone	6m	Sampling Resolution (m)	0.125 to 2
Sampling Point	256K	Test Time	5s~300s, Real time
Distance Uncertainty(m)	$\pm(1+0.005\% \times \text{distance} + \text{sampling resolution})$		
Interface	Ethernet: 10M/100M, Self-adopt, 4 pin; RS-232C:115.2kbps (Can be modified by RS-232C to set IP address).		

4. OTC2108L OTDR Module with 1:8 MEMS

In recent years, DCI equipment and fiber optic cable monitoring systems have been widely used in the maintenance of optical communication networks, fiber optic sensing, and disaster prevention systems. The OTC2108L OTDR module is a compact and cost-effective OTDR module suitable for DCI equipment and fiber optic cable monitoring systems, providing a small and cost-effective modular OTDR component solution for DCI equipment and fiber optic cable monitoring systems.



Module characteristics

- The module integrates 1 * 8 optical switches and OTDR modules into one module, with a module size of 180 * 95 * 23mm, suitable for DCI equipment and fiber optic cable monitoring systems with small internal space;
- The module adopts industrial product design and is suitable for the application of DCI equipment and fiber optic cable monitoring systems that operate 24/7. The dynamic range of the OTC2108L OTDR module can maintain relative stability within the working temperature range of -5 °C to 50 °C , ensuring accurate testing of DCI equipment and fiber optic cable monitoring systems in different working environments;
- The module has a dynamic range of up to 30dB, with event blind spots as low as 3 meters and attenuation blind spots as low as 15 meters. Simultaneously possessing a minimum sampling spacing of 12.5cm and up to 128000 sampling points to ensure high precision in fiber optic link testing;

Module characteristics

- The module can complete high-precision testing of fiber optic links within 5 seconds. Its 10/100M Ethernet interface supports fast downloading of OTDR test configurations and uploading of test results, making fiber optic cable monitoring easier;
- The module is controlled through Ethernet network and has a complete set of built-in control commands, including test configuration commands
- Command to view and read test results, supporting standard OTDR curve file format, suitable for integration and matching of DCI equipment and fiber optic cable monitoring systems. OPWILL provides OTDR offline analysis software that can be installed on PC computers to control the OTC2108L module, facilitating the control and debugging of OTDR modules during the development of DCI equipment and fiber optic cable monitoring systems.

Technical Specification

Model		OTC2108L					
Wavelength		1310 ±20nm		1550±20nm		1625±10nm	
O T D R	Dynamic Range(SNR=1)	30dB (Type value, Pulse 20μs) at 25°C					
	Dynamic Range(SNR=1)	28dB (Type, Pulse 20μs) at -5°C to 55°C					
	Wavelength	1625±10nm					
	Test Fiber	10μm/125μm Single Mode fiber (ITU-T G.652, G.654)					
	Pulse	3,5,10,30,50,100,275,500,1000,5000,10000,20000ns					
	Test Range	0.5, 2.5, 5, 15, 40, 80, 120, 160, 200 km					
	Event Dead Zone	≤3m	Attenuation Dead Zone	≤15m	Sampling interval	0.3125 to 2.5m	
	Sampling Point	128000	Reflectivity setting range	1.30000 to 1.80000	Linearity	±0.05 dB/dB	
	Return loss test accuracy	±2dB	Test distance uncertainty	±(1+0.0075%×Distance+Sampling Resolution)			
	Automatic testing	Test items: Total loss, distance to each event point, connection loss, return loss or reflectivity, automatic settings: distance range, pulse, average count Connection loss threshold: 0.01 to 9.99 dB Reflectivity: -14 to -70 dB; End: 1 to 99 dB Number of event point detections: up to 99 Automatic settings: distance range, pulse, average count					
	manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity					

4. OTC2108L OTDR Module with 1:8 MEMS

Technical Specification

S w i T c h	Isolation degree	≥60dB
	Repeatability	≤±0.05dB
	Insertion loss	≤1dB (Type 0.8dB)
	Return Loss	≥45dB
	conversion time	≤10ms
	Switching lifespan	≥10 ⁷ Time
	Optical Port	8
M o d u l e	Laser Safety	IEC 60825-1 : 2007 : CLASS 1 ; 21 CFR 1040.10
	Power Adapter	DC +12±1V/1.5A
	Interface	Ethernet interface : 20pin switch to 10/100M RJ45 interface
	Size and Weight	180*95*23mm , Weight:0.2kg
	Environment condition	Working temperature and humidity: -5°C to +55°C, ≤ 95% (no condensation) Storage temperature: -40°C to +70°C

Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

5. OTC2200 Series OTDR Module

OTC2200 Series OTDR Test Module is designed and manufactured by OPWILL, specialised for optical fibre monitoring system. This compact and high performance module was launched due to increasingly demand for online maintaining and monitoring optical fibre system recently.



Module characteristics

- The module adopts a compact design size (130x100x13mm), which is smaller than the A6 paper size, saving internal space for the optical cable monitoring system and suitable for various optical cable monitoring scenarios;
- The module has a dynamic range of up to 45dB, with event blind spots as low as 1 meter and attenuation blind spots as low as 5 meters. Simultaneously possessing a minimum sampling interval of 6cm and up to 256000 sampling points to ensure high precision in fiber optic link testing;
- Equipped with real-time testing mode and a new refresh rate of 300ms to update OTDR test results during real-time testing, the module can complete high-precision testing of fiber optic links within 5 seconds and has the ability to quickly display results;
- Standardization of commands: Built in a complete set of standardized control commands and comprehensive file formats, making it easy to match with fiber optic cable monitoring systems. Provide analysis software that can be installed on PC for controlling OTDR modules, facilitating the control and debugging of OTDR modules during the development of optical cable monitoring systems.

5. OTC2200 Series OTDR Module

Technical Specification

Model	OTC2200				
Dynamic Range	32-45dB (Type, Pulse 20μs , (SNR=1) at 25℃)				
Wavelength	1310 ±20nm	1490±20nm	1550±20nm	1625±10nm	1650±10nm
Test Fiber	10μm/125μm Single Mode(ITU-T G.652, G.654)				
Pulse	3, 5, 10, 30, 50, 100, 275, 500, 1000, 5000, 10000, 20000 ns				
Test Range	0.5, 2.5, 5, 15, 40, 80, 120, 160, 200 km				
Event Dead Zone	≤1m	Attenuation	≤5m	Sampling interval	0.125 to 2 m
Sampling Point	256000	Reflectivity setting range	1.30000 to 1.80000	Linearity	±0.05 dB/dB
Return loss test accuracy	±2dB	Distance uncertainty	±(1+0.005%×Distance+Sampling resolution)		
Automatic testing	Test items: Total loss, distance between each event point, loss, return loss or reflectivity				
manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity				
Laser Safety	IEC 60825-1 : 2007 : CLASS 121 CFR 1040.10				
Power	DC +5±0.1V/2A				
Interface	Serial port: RS-232C; The default baud rate is 115200 (can be adjusted according to user needs)				
Size and Weight	130(W)×100(H)×13(D)m, ≤0.5kg				
Environment Condition	Working temperature and humidity: -5℃ to+55℃, ≤ 95% (no condensation) Storage temperature: -40℃to+70℃				
EMC	EN 61326-1, EN61000-3-2				

Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

6. OTC2300 Series OTDR Module

In recent years, fiber optic cable monitoring systems have been widely used in the maintenance, security sensing, flood sensing, and disaster prevention systems of optical communication networks. The OTC2300 OTDR module provides a compact, sturdy, cost-effective, and high-performance card type OTDR solution for optical cable monitoring systems.



Module characteristics

- Space size is an important factor to consider in the design of optical cable monitoring systems, while also taking into account factors such as functionality, performance, and cost. Customers require a compact card type OTDR module, with the size of the OTC2300 OTDR module (180 × 120 × 22mm), which can be used even in optical cable monitoring systems with small space limitations;
- The OTC2300 OTDR module adopts industrial product design and fully complies with the application of a 7 × 24-hour optical cable monitoring system. At the same time, the dynamic range of the OTC2300 OTDR can remain stable within the working temperature range of -5 °C to 55 °C , ensuring accurate testing of the optical cable monitoring system in different working environments;
- The dynamic range of the OTC2300 OTDR module is as high as 43dB, with event blind spots as low as 1 meter and attenuation blind spots as low as 5 meters. Simultaneously possessing a minimum sampling interval of 12.5cm and up to 256000 sampling points to ensure high precision in fiber link testing;
- The OTC2300 has a real-time testing mode and a new limit rate of 300ms during real-time testing to update OTDR test results, making it very suitable for factory verification testing by fiber optic cable manufacturers;
- The OTC2300 OTDR module can complete high-precision testing of fiber optic links within 5 seconds at the fastest. At the same time, the 10/100M Ethernet interface can support fast downloading of card OTDR test configurations and fast uploading of test results, making fiber optic cable monitoring easier;
- It has fast and accurate operation commands, supports RS-232C interface compatible with Ethernet network control, and supports RJ45 Ethernet interface with 10/100M speed. At the same time, OPWILL provides OTDR offline analysis software that can be installed on a PC to control the OTC2300 OTDR module, facilitating the control and debugging of the OTDR module during the development of optical cable monitoring systems.

6. OTC2300 Series OTDR Module

Technical Specifications

Model		OTC2300				
Dynamic Range(SNR=1) at 25°C	32-45dB (Type Value, Pulse 20μs)		Dynamic Range (SNR=1) at -5°C to 55°C		30-45dB (Type Value, Pulse 20μs)	
Wavelength	1310 ±20nm	1383 ±1nm	1490±20nm	1550±20nm	1625±10nm	1650±10nm
Test Fiber	10μm/125μm Single Mode Fiber(ITU-T G.652, G.654)					
Pulse	3, 5, 10, 30, 50, 100, 275, 500, 1000, 5000, 10000, 20000 ns					
Test Range	0.5, 2.5, 5, 15, 40, 80, 120, 160, 200 km					
Event Dead Zone	≤1m	Attenuation Dead Zone	≤5m	Sampling interval	0.125 to 2 m	
Sampling point	256000	Reflectivity setting range	1.30000 to 1.80000	Linearity	±0.05 dB/dB	
Return loss test accuracy	±2dB	Test distance uncertainty	±(1+0.005%×Distance+Sampling Resolution)			
Automatic testing	Test items: Total loss, distance to each event point, connection loss, return loss or reflectivity, automatic settings: distance range, pulse, average count					
manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity					
Laser Safety	IEC 60825-1 : 2007 : CLASS 1 21 CFR 1040.10					
Power	DC +12±1V/1.5A					
Interface	Ethernet interface: 20pin to 10/100M RJ45 interface Serial port: RS-232C: 115.2kbps (set IP address through RS-232C interface)					
Size and Weight	180(W)×120(H)×22(D)mm, ≤0.5kg					
Environment condition	Working temperature and humidity: -5°Cto+55°C, ≤ 95% (no condensation) Storage temperature: -40°C to+70°C					

Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

7. OTC2400 CFP2 OTDR Module

With the rapid development of fiber optic communication, fiber optic cable monitoring has been widely used in the maintenance of optical communication networks and fiber optic sensing fields. With the application of DWDM systems, OTDR modules have been widely used in fiber optic cable monitoring, fault location, and fiber optic link performance analysis. The OTC2400 OTDR module has four built-in optical switches for fiber optic cable monitoring. DWDM systems provide a compact, robust, cost-effective, and high-performance card type OTDR solution.



Function Specification

- The module adopts CFP2 packaging mode, supports hot swappable use, built-in 4-channel optical switches, with a size of only $136.8 \times 41.5 \times 13.6$ mm, suitable for small space and size requirements, and continuous business fiber optic cable monitoring systems;
- The OTDR module has a dynamic range of up to 40dB, with a 1-meter event blind zone and a 5-meter attenuation blind zone. It also has a sampling spacing of 12.5cm and up to 256000 sampling points to ensure high accuracy in fiber link testing;
- Fast response speed, with real-time testing mode, and a high rate of 300ms to update OTDR test results during real-time testing, with the ability to quickly display results;

7. OTC2400 CFP2 OTDR Module

Function Specification

- The module can complete high-precision testing of fiber optic links within 5 seconds, and can support fast downloading of card OTDR test configurations and uploading of test results, making fiber optic cable monitoring easier;
- A sufficiently short blind zone (event blind zone 0.8m, attenuation blind zone 4m) and up to 256000 sampling points ensure accurate testing of OTDR throughout the entire fiber optic link;
- Adopting SPI communication method, which means data exchange between modules and single board software is completed using SPI. During SPI communication, the single board operates in master mode and the module operates in slave mode.

Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

Technical Specification

Model		OTC2400			
Dynamic Range		32-40dB (Typical value, pulse width 20 μs, (SNR=1) at 25)			
Wavelength		1502±0.5nm			
Test fiber		10μm/125μm Single mode fiber (ITU-T G.652, G.654)			
Pulse		3,5,10,30,50,100,275,500,1000,5000,10000,20000 ns			
Test range		0.5,2.5,5,15,40,80,120,160,200 km			
Event dead zone	≤1m	Attenuation dead zone	≤5m	Sampling interval	0.125 to 2 m
Sampling point	256000	Return loss test accuracy	±2dB	Linearity	±0.05 dB/dB
Test distance uncertainty	±(1+0.005%×Distance+Sampling resolution)				
automatic testing	Test items: Total loss, distance to each event point, connection loss, return loss or reflectivity, automatic settings: distance range, pulse, average count				
manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity				
Optical switch indicators	Isolation degree	≥60dB			
	repeatability	≤±0.05dB			
	Insertion loss	≤1dB (Type value 0.8dB)			
	Return Loss	≥45dB			
	conversion time	≤10ms			
	Switching lifespan	≥10^7 times			
	Number of optical ports	4			
Laser Safety		IEC 60825-1 : 2007 : CLASS 121 CFR 1040.10			
Power adapter		DC+5±0.1V/1A, DC+3.3±0.1V/1A			
Interface		SPI electrical interface			
Size and Weight		136.8×41.5×13.6mm, ≤0.5kg			
ambient condition		Working temperature and humidity: -5°C to+55°C, ≤ 95% (no condensation) Storage temperature: -40°Cto+70°C			
EMC		EN 61326-1, EN61000-3-2			

8. OTC2500 MSA OTDR Module

In recent years, fiber optic cable monitoring systems have been widely used in the maintenance of optical communication networks and fiber optic sensing. With the application of DCI equipment and DWDM systems, OTDR modules have been widely used in fiber optic cable monitoring, fault location, and fiber optic link performance analysis. The OTC2500 OTDR module provides a compact, robust, cost-effective, and high-performance MSA packaged OTDR solution for fiber optic cable monitoring, DCI, and DWDM systems.



Module features:

- The module size is 90 * 70 * 12.5mm, suitable for small space and size requirements, and can be used for continuous business fiber optic cable monitoring systems or DCI, DWDM equipment;
- The module has a dynamic range of up to 43dB, with a 1-meter event blind zone and a 5-meter attenuation blind zone, a 12.5cm sampling interval, and up to 256000 sampling points to ensure high accuracy in fiber link testing;
- Equipped with real-time testing mode and timed testing mode, with a high speed of 300ms to refresh and present OTDR test results, and the ability to quickly display fiber optic cable results;
- The module can complete high-precision testing of fiber optic links within 5 seconds, and can support fast downloading of card OTDR test configurations and uploading of test results, making fiber optic cable measurement and monitoring easier;
- Communication mode: The module supports two communication modes: RJ45 Ethernet interface with 10/100M speed and RS-232 interface (TTL level);
- The OTDR module is equipped with a complete set of control commands for viewing and reading test results, making it easy to match with the equipment. At the same time, OPWILL provides OTDR offline analysis software that can be installed on a PC to control the OTDR module, facilitating the control and debugging of the OTDR module during equipment system development.

Technical Specification

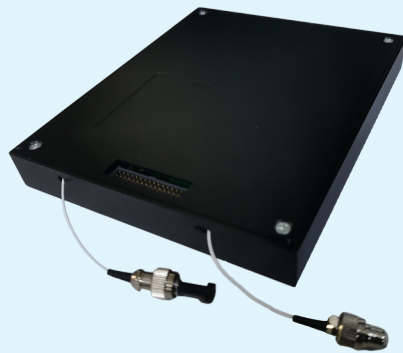
Model	OTC2500				
Dynamic Range	32-43dB (Type value , Pulse 20μs , (SNR=1) at 25°C)				
Wavelength	1310 ±20nm	1490±20nm	1550±20nm	1625±10nm	1650±10nm
Test Fiber	10μm/125μm Single mode (ITU-T G.652, G.654)				
Pulse	3,5,10,30,50,100,275,500,1000,5000,10000,20000 ns				
Test Range	0.5,2.5,5,15,40,80,120,160,200 km				
Event Dead Zone	≤1m	Attenuation Dead Zone	≤5m	sampling interval	0.125 to 2 m
Sampling point	256000	Return loss test accuracy	±2dB	Linearity	±0.05 dB/dB
Test distance uncertainty	±(1+0.005%×Distance+Sampling Resolution)				
Automatic testing	Test items: Total loss, distance to each event point, connection loss, return loss or reflectivity, automatic settings: distance range, pulse, average count				
Manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity				
laser Safety	IEC 60825-1 : 2007 : CLASS 121 CFR 1040.10				
Power Adapter	DC 5V±0.1V/2A				
Interface	RS-232 interface (TTL level), RJ45/100M Ethernet interface				
Size and weight	150*125*19mm, ≤0.5kg				
Ambient condition	Working temperature and humidity: -5°C to+55°C, ≤ 95% (no condensation) Storage temperature: -40°C to+70°C				
EMC	EN 61326-1, EN61000-3-2				

Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

9. OTC2602 High Performance OTDR Module

In recent years, fiber optic cable monitoring systems have been widely used in the maintenance of optical communication networks and fiber optic sensing. With the application of DCI equipment and DWDM systems, OTDR modules have been widely used in fiber optic cable monitoring, fault location, and fiber optic link performance analysis. The OTC2602 OTDR module is equipped with two built-in optical switches for fiber optic cable monitoring. The DCI and DWDM systems provide a compact, robust, cost-effective, and high-performance card type OTDR solution.



Application

- Installation and maintenance of fiber optic communication system;
- Network monitoring of telecommunications operators;
- Fiber optic cabling detection for data center connection;
- Detect and maintain the fiber optic lines relied upon for cable TV signal transmission to ensure stable signal quality;
- Submarine fiber optic cable monitoring;
- In the field of industrial control and automation, fiber optic communication and control are tested in industrial environments.

Technical specifications

Model	OTC2602					
Dynamic Range	32-43dB (Type, Pulse 20μs, (SNR=1) at 25°C)					
Wavelength	1310 ±20nm	1490±20nm	1550±20nm	1502±0.5nm	1625±10nm	1650±10nm
Test Fiber	10μm/125μm Single mode fiber (ITU-T G.652, G.654)					
Pulse	3,5,10,30,50,100,275,500,1000,5000,10000,20000 ns					
Test Range	0.5,2.5,5,15,40,80,120,160,200 km					
Event Dead Zone	≤1m	Attenuation Dead Zone	≤5m	Sampling interval	0.125 to 2 m	
Sampling Point	256000	Return loss test accuracy	±2dB	Linearity	±0.05 dB/dB	
Test distance uncertainty	±(1+0.005%×Distance+Sampling Resolution)					
Automatic testing	Test items: Total loss, distance to each event point, connection loss, return loss or reflectivity, automatic settings: distance range, pulse, average count					
manual test	Test items: transmission distance, 2-point method, connection loss, reflectivity					
Optical switch indicators	Isolation degree	≥60dB				
	Repeatability	≤±0.05dB				
	Insertion loss	≤1dB (Type Value 0.8dB)				
	Return Loss	≥45dB				
	Conversion time	≤10ms				
	Switching lifespan	≥10^7 times				
	Number of optical ports	2				
Laser Safety	IEC 60825-1 : 2007 : CLASS 121 CFR 1040.10					
Power	DC 5V±0.1V/2A					
Interface	RS-232 interface (TTL level), RJ45/100M Ethernet interface					
Size and Weight	150*125*19mm, ≤ 0.5kg					
Environment condition	Working temperature and humidity: -5°C to+55°C, ≤95% (no condensation) Storage temperature: -40°C to+70°C					
EMC	EN 61326-1, EN61000-3-2					

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