DTA-200
Synchronisation Analyser

DTA-200 Synchronisation Analyser is specially designed for conducting clock synchronisation of PTN or Packet Ethernet. It is developed in accordance with IEEE1588v2, SyncE, 1PPS+ToD, Ethernet, and E1 such standards, provides a complete clock, frequency, and time synchronisation test solution for operators.

- Support 1588v2 testing, 1PPS+ToD testing, SyncE testing, 1PPS/PP2S testing up to 1000M;
- Adapted to lab and field environments with optional internal measurement references—GPS and internal rubidium;
- Support 10M to1000M rate packet Ethernet test functions, such as OAM, MPLS-TP, RFC2544, Y.1564 and so on (Not support now, coming soon);
- Support E1/T1 testing (Not support now, coming soon).

Platform

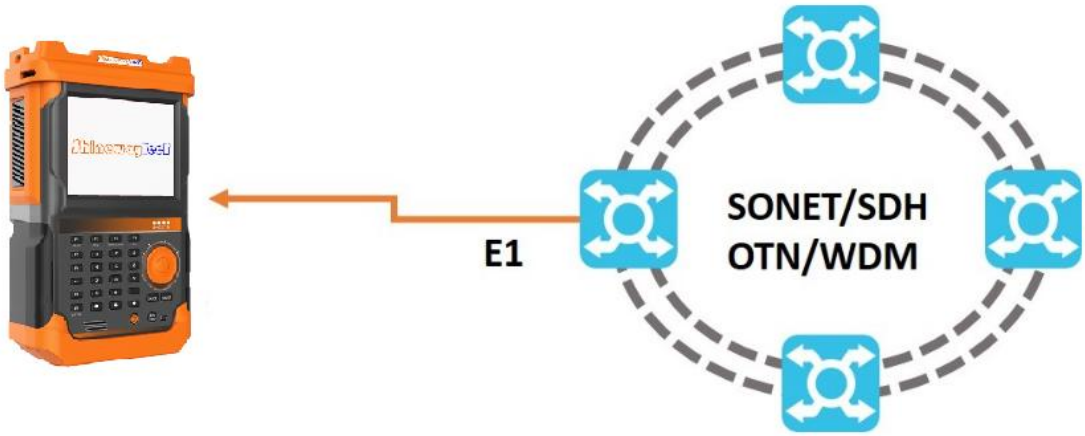
- Compact and Lightweight designed, high portable
- Powerful modular intelligent network test platform
- Graphical user interface, easy to use
- Dial, number keys and function keys for flexible scrolling and selecting.
- 6.5inches outdoor-enhanced LCD color touch screen
- Fast and efficient test result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

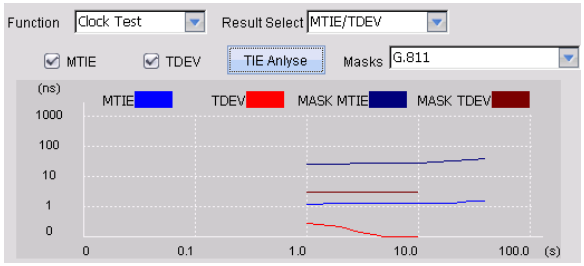
Key Feature

- Support 1588v2, SYNC-E, 1PPS+ToD, and TDM;
- Integrated a rubidium or 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 test IEEE1588v2 time server, IP RAN/PTN/OTN/xPON infrastructures, and BS time synchronisation precision and performance;
- Support to calculate MTIE, TDEV;
- Support to reproduce UTC time and clock with high precision;
- 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 synchronisation;
- Support 1PPS+ToD, IEEE1588v2 PTP and SYNC-E mask and slave emulation testing.

Applications

TDM Application

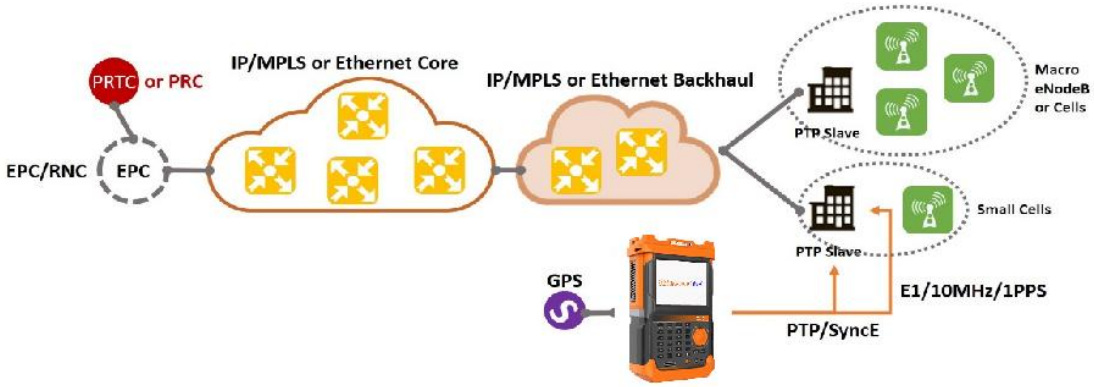


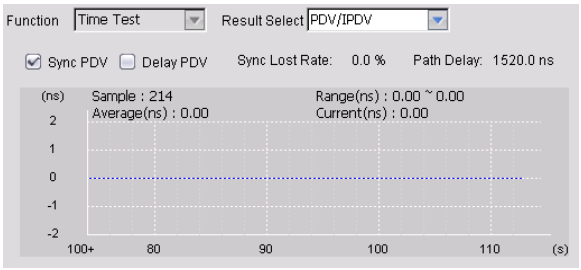


SUPPORT MARKS

- G.811;
- G.812 Type I;
- G.812 Type II;
- G.812 Type IV;
- G.813 Gen SEC Option 1;
- G.813 Gen SEC Option 2;
- G.813 T-fer SEC Option 2;
- G.813 T-sient SEC Option 2;
- G.813 Holdover SEC Option 2;
- G.823 PDH Sync;
- G.823 G.523 PRC;
- G.823 G.523 SSU;
- G.823 G.523 SEC;
- G.8261 EEC Option 1;
- G.8261 EEC Option 2;
- G.8261.1 Case 3;
- G.8262 Gen EEC Option 1;
- G.8262 Gen EEC Option 2;
- G.8262 T-fer EEC Option 2;
- G.8262 T-sient EEC Option 2.

LTE-A / TDD LTE or FDD LTE / 3G Application





General Specifications

User Interface	
Screen	6.5 Inch TFT Touch Screen (640 x 480);
Other Interface	
USB	USB2.0, A type, 2; USB2.0 Mini B type, 1;
Ethernet	Ethernet 10/100, RJ45;
Audio	3.5mm Audio Interface;
Storage	8G;
Physical Specifications	
Temperature	Operating: -10°C to 50°C; Storage: -40°C to 70°C;
Relative Humidity	0% to 95%(non-condensing);
Size(H×W×D)	Platform: 319mm x 202mm x 105mm; Module:25mm x 97mm x 259mm;
Weight	Platform: 2.8kg; Module: 0.8kg;
Vibrancy	10Hz to 500Hz < 1.5g (on 3 main axes);
Mechanical Shock	6 sides, 8 edges < 760cm, according to GR-196-CORE;
EMC	EN55022/CIPSR22; EN61000-3-2; EN55024;
Battery and Power Supply	
Battery	Rechargeable Li-Ion batteries; Working time: 9 hours (typical for Atomic Clock); Working time: 4 hours (typical for Rubidium Clock); Charging time: 6 hours (typical: 25°C);
Power Source	Input: 100-240VAC, 50-60Hz,2A; Output: 19VDC, 4A.

Technical Specifications

Clock

Internal Time Base			
	Rubidium Clock	Atomic Clock	
Stability	$5x10^{-11}$ (Typical 25℃)		
Warm up Stability	100s to < $3x10^{-12}$	100s to < $2x10^{-11}$	
Ageing Rate	24h: < $5x10^{-11}$ per month	24h: < $3x10^{-10}$ per month	
GPS Disciplining			
Internal GPS	12 channels, high sensitivity, 15ns		
Time Accuracy to UTC	±25ns		
Interfaces			
Time Input	• 1PPS+ToD;	• 1PPS/PP2S;	• IEEE 1588v2 PTP (Slave);
Clock Input	• SyncE;	• E1/2MHz;	• 10MHz;
Output	• 1PPS+ToD; • 1PPS/PP2S;	• E1/2MHz; • 10MHz;	• IEEE 1588v2 PTP (Master);

Reference Clock					
Standard	GPS				
Optional	• 1PPS+ToD;	• BNC 1PPS;	• E1/2MHz;	• 10MHz;	• SyncE;

Synchronous Ethernet Test		
SyncE	• Specify quality level of transmitted Ethernet signal; • Analysis of QL indicated in received Ethernet signal with alarm at missing QL indications; • Result: SSM RX count and rate, SSM TX count, indicated QL statistics, SSF seconds; • ESMC message captured and exported in Wireshark format;	
IEEE1588v2 PTP	• Port of Ethernet interface can be acted as master or slave independently; • Supports profiles: G.8265.1, G.8275.1, User defined; **Parameter configuration:**	
	• Domain: 0 to 255; • Step mode: one-step, two-step; • Delay mechanism: Delay request/response, Peer delay; • Clock source: internal or UTC locked with GPS;	• Clock Identify; • Priory #1 or #2, class, time source; • Accuracy Index: 0 to 255; • Announce interval: 1/2 to 64; • Sync interval: 1/2 to 256; • Delay request interval: 1/16 to 64;
	Protocol stack: • Layer2: Ethernet, Ethernet/VLAN; • Layer3: none, IPv4;	
	PTP protocol analysis: • Statistics of IEEE1588 message and message rate; • Logged IEEE1588 events: clock state transitions, state transition events, faults, changes in grand-master clock; • IEEE1588 message captured and exported in Wireshark format;	

1G Ethernet (Coming Soon)

Ethernet	
Port	• Electrical interface: 1 port, 10/100/1000M Base-T; • Optical interface: 1 port, 100/1000M Base-X; ***User selectable optical module: 850nm, 1310nm, 1550nm.***
Ethernet Feature	Auto negotiation, full and half duplex, flow control;
Configuration	Monitor/generate, pass-through;
Encapsulation	Ethernet type II, IEEE802.3 with 802.2, IEEE802.3 with SNAP;
Configuration, Monitoring, and Generation	
Traffic Generation	• Variable line rate traffic generation, up to full line rate; • Traffic generation: continuous, burst, ramp, n-frame, n-burst, n-ramp; • Adjustable frame size: 64 bytes to 16000 bytes; • Frame size: constant, iMAX, random; • User-defined traffic mix of unicast and broadcast frames; • Fixed or increment MAC/IP identifier; • User programmable DSCP/TOS byte; • Configurable IP and Ethernet source and destination addresses (support IPv4 and IPv6 addressing); • User programmable TCP/UDP address; • Generate pause frames, respond to pause frames; • Answer incoming ARP, ping requests;

Stacked VLAN	• Up to 3 user-settable VLAN tags;
	• Parameters per VLAN tag:
	  • Ethernet type II 0x8100 (802.1Q), 0x88a8 (802.1ad), 0x9100, 0x9200, 0x9300;
	  • User-defined VLAN ID, CFI, VLAN priority;

Multi stream	Number of streams: up to 8 streams per port can be activated;
Error Injection	FCS, IP check sum error, UDP/TCP check sum error, bit error;
Alarm generation	No link;
Result, Monitoring and Generation	
Status	• Link status, interface type, jabber detected, frames present, MPLS/VLAN, speed, full or half duplex, signal present, bit rate of incoming Ethernet signal, auto negotiation complete; • Link partner abilities: speed/duplex; • Indicators of utilisation, throughput and errored frames; • Signal level indication for optical Ethernet interfaces;
Performance Statistics	Utilisation, throughput, frame rate;
Frame Statistics	• Total frames, total testing frames, total not testing frames, unicast/multicast/broadcast frames, number of pause frames; • Total VLAN frames; • Total MPLS frames; • Total errored framed, number of oversized, normal, and runt frame, number of FCS errored;
Frame Distribution Statistics	• Total valid/frames, <64, 64-127, 128-511, 512-1023, 1024-1518, >1518;
Multi stream	**Display information per steam:** • Frame loss count/rate, throughput, latency, packet fitter, frames and bytes received and transmitted;
Transmit Statistics	Total frames, unicast/multicast/broadcast;

Result, Monitoring and Generation	
Filter	**Filter condition support:** • Source and destination MAC/IP, IPv6, VLAN ID and VLAN priority, MPLS, IP TOS, TCP/UDP source and destination port, Ethernet type and IP protocol;
BER Test and Service Disruption Test	
BER Test	• Generation and detection of test pattern, count of errors in received test pattern; • Pattern generation: layer 1 to layer4; • Frame loss count and frame loss seconds; • BER measurement results; • Test pattern: PRBS9, PRBS11, PRBS15, PRBS20, PRBS23, PRBS31, CRPRJ, JTPAT, SPAT, 32bits user defined;
Error Injection	FCS, IP check sum error, UDP/TCP check sum error, bit error;
Service Disruption Test	**Service disruption test activated as part of BER test:** • Max/avg service disruption test, resolution: 0.1us; • Number of service disruption;
Loopback	

Loopback Test	• Layer 1 to layer 4 loopback test;
	• Advanced loopback test:
	  • Packet loss setting: percentage, packet count, time;
	  • Loopback drop enable: protocol loss, protocol pass, control, CRC error, IP/TCP/UDP error;

RFC3393	
Jitter Test	• G.711, G.723.1, G.729 and so on VoIP packet jitter test; • Jitter result: hits, min, max, current, average;
RFC2544	

RFC2544 Test	• Switch/router test and single ended network test mode:
	  • Throughput, frame loss, latency, back-to-back;
	• End-to-end network test mode (2 units in local-remote setup):
	  • Throughput, frame loss, back-to-back;

Service Activation Test (Y.1564)	
Service Activation Test	**ITU-T Y.1564 Service Activation Test:** • Up to 8 services per port; • Colour-aware and non-colour-aware in combinations; • Test modes: one-way (uni-or bi-directional), round-trip; • Verification against service acceptance criteria: information rate, frame transfer delay, frame delay variation, frame loss rate, availability;
Service Configuration Test	• Subtest for: CIR, EIR, traffic policing; • Step duration: 1-60s (user define); • Number of steps: 1 to 4; • Result: pass/Fail indication, IR (min/avg/max), FL (count/FLR), FTD, FDV (min/ avg/max (during measurement));
Service Performance Test	• All services tested simultaneously at CIR; • Duration: 15min, 2hours, 24 hours, or user defined; • Result: pass/fail indication, IR (min/avg/max), FL (count/FLR), FTD, FDV (min/avg/max (during measurement));
Remote Smart Loopback	• Use as local unit control another remote unit for RFC2544 and Y.1564 bi-directional testing; • Support: layer 1 to layer 4 smart loopback test;
Advanced IP Tools	
PING	**For connectivity and configuration check:** • Round trip time (RTT); • Support IPv4, TTL, URL;
Trace Route	**Trace IP route over IP network:** • Information per hop: PING time, number of ping timeouts;

Advanced IP Tools			
VCT Cable Test	**Use for CAT5 cable connectivity check:**		
	• Status: pass/Fail; • Fault location;	• Channel; • Polarity;	• Pair Skew;
Flow Control	**Flow control time, us:**		
	• Pause time: total, last, max, min;	• Pause Frame count: TX, RX;	
FTP Upload/ Download	**Use for FTP server and client emulation:**		
	• Support IPv4 and URL; • Username/password;	• File upload/download; • Result: pass/fail indication, upload/download time display;	
HTTP	**WEB access:**		
	• Support IPv4 and URL;	• HTTP access pass/fail;	
Advanced PING *(Topology)*	**Advance/Fast PING, PING segments of the IP one by one in one time:**		
	• IP address range: start, end • Send count;	• Timeout (ms); • Status: pass/fail indication;	
MPLS			
Number of MPLS Header	Up to 3 MPLS header set by user;		
Parameter per MPLS Header	User defined label, EXP and TLL fields in each MPLS header;		
Statistics	MPLS frame count;		

OAM *(MPLS-TP)*	• Complies ITU-T G.8113.1;
	• Support OAM messages:
	  • ITU-T Y.1731: CCM, LBM, LBR, LTM, LTR, AIS, LCK, LMM, LMR, 1DM, DMM, DMR;
	  • IEEE802.1ag: CCM, LBM, LBR, LTM, LTR;		

Ethernet OAM			
OAM Standards	• ITU-T Y.1731 service layer OAM; • IEEE802.1ag connectivity layer OAM; • IEEE802.3 (formerly IEEE802.3ah) access link OAM;		
Messages	**Generate and receive following OAM messages:** • ITU-T Y.1731: CCM, LBM, LBR, LTM, LTR, AIS, LCK, LMM, LMR, 1DM, DMM, DMR; • IEEE802.1ag: CCM, LBM, LBR, LTM, LTR; • IEEE802.3ah: information, variable request, variable response, loopback control;		
IEEE802.3ah	• Discovery;	• Loopback activate;	
Statistics	Number of each message generated/received;		
Ethernet Frame Capture			
Buffer Size	• 32Kbytes;	• When capture buffer full: stop;	
Capture Data	CAP format for display in Wireshark.		

PDH (Coming Soon)

<table>
<tr><td colspan="5">Test Patterns</td></tr>
<tr><td>PBBS</td><td>• 2E23;</td><td>• 2E20;</td><td>• 2E15;</td><td>• 2E11</td></tr>
<tr><td>User</td><td colspan="4">Allowing user define 8-byte test patterns</td></tr>
<tr><td colspan="5">PDH/T-Carrier Bit Error Insertion</td></tr>
<tr><td colspan="5">• 1.5M: Code, Fas, CRC, Bit;
• 2M: Code, Fas, CRC, Bit;
• Insertion method: continuous, alternative, burst, single, N-Frame, Rate;
• Ratio: 1×10-9 to 2×10-3(depending on setting)</td></tr>
<tr><td colspan="5">Alarm Generation</td></tr>
<tr><td colspan="5">• 1.5M: LOS, LOF, AIS, RAI, PATTERN LOS;
• 2M: LOS, LOF, LOFM, AIS, RAI, MFRAI, CRCLOFM, PATTERN LOS;
• Insertion method: continuous, alternative, burst</td></tr>
<tr><td colspan="5">Measurement</td></tr>
<tr><td>1.5M</td><td>• LOS;
• LOF;
• AIS;</td><td>• RAI;
• PATTERN LOS;
• Code;</td><td colspan="2">• Fas;
• CRC;
• Bit Error</td></tr>
<tr><td>2M</td><td>• LOS;
• LOF;
• LOFM;
• AIS;</td><td>• RAI;
• MFRAI;
• CRCLOFM;
• PATTERN LOS;</td><td colspan="2">• Code;
• Fas;
• CRC;
• Bit Error</td></tr>
<tr><td>Error and Alarm</td><td colspan="4">• Total bit error count or alarm seconds;
• Total bit error rate;
• Current bit error rate (advanced 1 second)</td></tr>
<tr><td>ITU-T G.821 Analysis</td><td>• Current bit error;
• Current BER;
• Total byte bit error;
• Total BER;</td><td>• ES;
• %ES;
• SES;
• %SES;</td><td>• EFS;
• %EFS;
• AS;</td><td>• %AS;
• UAS;
• %UAS</td></tr>
<tr><td rowspan="2">ITU-T G.826 Analysis</td><td colspan="4">RAI-based, remote end and near end analysis:</td></tr>
<tr><td colspan="2">• BE;
• BBE;
• BBE rate;
• ES;</td><td colspan="2">• %ES;
• SES;
• %SES;
• AS;</td><td>• %AS;
• UAS;
• %UAS</td></tr>
</table>

Ordering Information

Module	Description
Platform	Test Platform, support SDH, OTN, Ethernet, Packet Ethernet, OTDR test modules
DTA-200	Synchronisation test module;
	Adapted to lab and field environments with optional internal measurement references—GPS and internal rubidium;
	Prove 1588v2 (PTP), Sync-E etc. implementations. To ITU-T G.8261, etc.;
	Prove 1588v2 (PTP) to the ITU-T Telecom Profile G.8265.1;
	Test 1588v2 Ordinary Clock;
	Support IEEE1588v2 PTP Master Clock and Slave Clock, also support one-step and two-step clock modes;
	Support PTP message over Ethernet;
	Support setup Sync Announce and Delay_Req PTP message frequency, support PTP header setup, include clock class domain number and so on parameters setup;
	Support PTP message statistics;
	Measure time and frequency (MTIE/TDEV) to specified limits (G.823, G.824, and G.8261.1.);
	Support IEEE1588v2(PTP),1PPS+ToD,1PPS/PP2S and Sync-E up to 1000M;
	Measure2.048MHz/2.048bit/s and 10MHz recovered clock compliance to ITU-T G.823/G.824/G.8261.1 (MITE/TDEV);
Accessories Code	Accessories Description
16120020	GPS receiving antenna;
16120030	GPS receiving feeder;
16120080	SMA test cables, two;
16060090	75ohm BNC cables, 2m, two;
16060040	CAT5 cables, 3m, two;
16080010	LC/PC to LC/PC full-duplex single-mode fibre, 3m, one;
14020090	1.25G 1310nm 15Km LC SFP optical module, one;
05020050	SFP optical port dust proof cap - black - rubber, one;
05020060	RJ45 electrical port dust proof cap - black - rubber, three;
16060010	3 pins adapter cable, one;
43170020	100-240V input and 19V output AC/DC power adapter, one;
18080010	disc include user manual and remote control software, one;
18010010	Factory test report, one;
18010020	Calibration certificate, one;
18040011	One year warranty service.

Synchronisation Optional Software	
OPAP-TimeReferASync	Use 1PPS+ToD and IEEE1588v2 PTP as reference time;
OPAP-ClockReferASync	Use SyncE, 1PPS, 2.048MHz, 2.048Mbps, 10MHz as reference clock;
OPAP-PTP3MSASync	IEEE1588v2 PTP support Unicast and Multicast transmit method with IP Layer;
OPAP-SyncEwanderASync	SyncE wander test;
OPAP-FrequencyASync	Frequency test feature for SyncE, 2.048MHz, 2.048Mbps, 10MHz;
OPAP-EFrequencyASync	Advanced frequency sampling test;
OAPA-100FXASync	IEEE1588v2 PTP and SyncE test feature for 100M Base-X port;
OPAP-CaptureASync	IEEE1588v2 PTP message capture and decode;
OPAP-ESMCASync	SyncE ESMC test;

Optional Hardware	
43160031	Lithium polymer rechargeable battery;
OPAP-One warranty	One year extended warranty service;
OPAP-Two warranty	Two years extended warranty service;
14020160	1.25G-850nm-550m-MM-LC-SFP-DDM;
14020090	1.25G-1310nm-15km-SM-LC-SFP-DDM;
14020340	1.25G-1550nm-40km-SM-LC-SFP-DDM.

*** Specifications subject to change without notice.**