



TFN D300S 2.5G Digital Transmission Analyzer

——Supports STM-16/OC-48 high-speed transmission testing, integrated overhead monitoring, APS protection switching, and TCM cascade analysis to facilitate precise operation and maintenance of multi-service transmission networks



Product Introduction

The D300S is a high-performance transmission test module for the TFN FT100 intelligent network test platform, supporting full-rate SDH/SONET and PDH/DSn testing from 2.5 Gbps (STM16/OC48) to 2.048 Mbps (E1/DS1). Featuring advanced features such as overhead editing and capture, pointer event simulation, APS automatic protection switching, and TCM cascade monitoring, it is ideal for deployment acceptance, maintenance optimization, and fault location in optical transmission networks. It is a highly reliable testing partner for operators, private network customers, and equipment manufacturers.

Core selling point (solving customer pain points)

1. High-speed full coverage: Supports STM1/4/16 and OC3/12/48 optical port testing, meeting the high-speed transmission testing requirements of backbone networks and metropolitan area networks.
2. Intelligent operation and maintenance empowerment: Supports intelligent scanning of remote devices and automatic configuration mapping structure, greatly improving testing efficiency and reducing manual configuration errors.
3. Non-disruptive service monitoring: Online pass-through and advanced pass-through modes support real-time overhead modification and error insertion without affecting existing network services.
4. High-precision APS testing: APS switching time measurement resolution reaches 1 μ s, accurately verifying network protection performance.
5. Modular platform compatibility: Based on the FT100 platform, it can be expanded with modules such as OTN, Ethernet, and synchronous testing, achieving "one machine with multiple functions".

Main functions

- SDH/SONET testing: STM1/4/16 optical port, STM1e electrical port, supports overhead monitoring/editing, pointer adjustment, alarm/error insertion



- PDH/DSn test: E1/E3/E4, DS1/DS3 interface, supports framing/unframing, HDB3/AMI/B8ZS/B3ZS line code types
- TCM cascade monitoring: compliant with G.783/G.707 Annex D/E, supporting multi-layer tandem connection monitoring and performance analysis
- APS protection switching test: configurable trigger conditions, automatic judgment of switching success/failure, and recording of K1/K2 byte status
- Branch scanning and mapping: Supports full-path service scanning and simulation from VC11/VT1.5 to VC416c/STS48c
- Error performance analysis: G.821/G.826/G.828/G.829/M.2100/M.2110 standards, providing key indicators such as ES/SES/UAS
- Loopback delay test: resolution 0.1 μ s, maximum test time 10 seconds
- Data export and remote control: USB result export, network port remote control, support background data analysis and report generation

Product Parameters

General Features

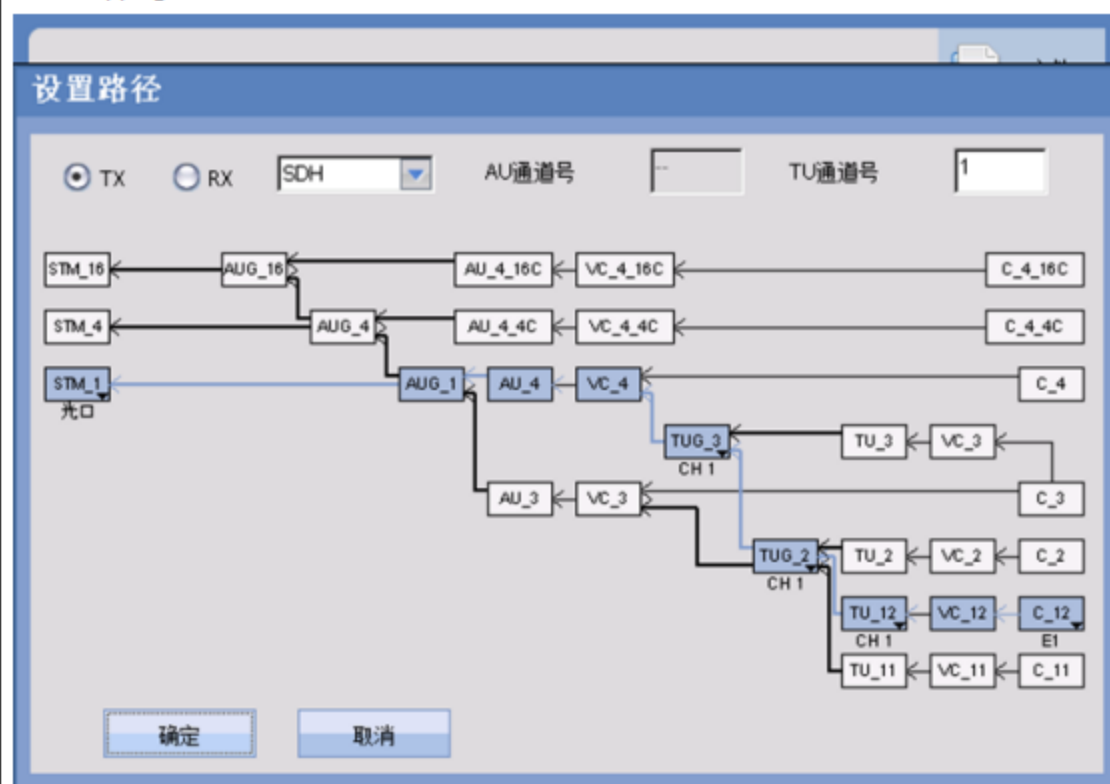
User Interface	
Display	6.5-inch TFT touch screen display (640×480 resolution)
Business Interface	
USB data port	USB2.0, Type A interface, 2; USB2.0 MiniB interface, 1
Ethernet port	Ethernet 10/100, interface: RJ45 (port)
Storage capacity	8G
Other interfaces	
Audio Interface	For connecting optional headphones, 3.5mm diameter jack
Other Features	
Size and weight	FT100: 319(H)× 202 (W) × 105(D) mm; 2.8kg D300S : 25(H)× 97 (W) × 259(D) mm; 0.4kg
Temperature	Operating temperature: -10°C to 50°C; Storage temperature: -40°C to 70°C
Relative humidity	0% to 95% (non-condensing)
Vibration	<1.5g from 10Hz to 500Hz (on all three major axes)
Mechanical shock	<760 cm on six sides and eight main edges (according to GR-196-CORE standard)
EMC	EN55022/CIPSR22, EN61000-3-2, EN55024
Battery and power supply	
Battery	Rechargeable and replaceable lithium-ion battery Working time: 8 hours (typical) Charging time: 6 hours (typical) (25°C)
Powered by	Input: 100 to 240V (AC), 50Hz/60Hz, 1.6A Output: 19V, 4A

Technical Specifications

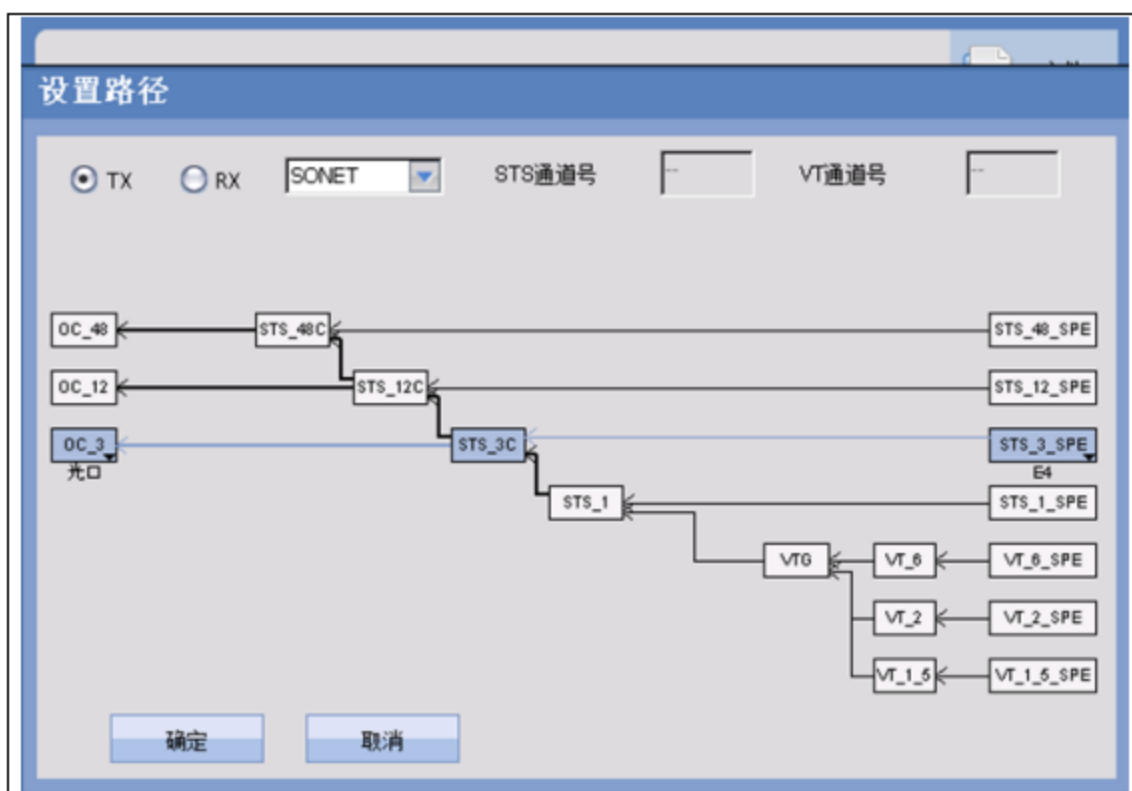
SDH/SONET Testing	
Test port	STM-16/STM-4/STM-1, OC-48/OC-12/OC-3 optical interface : SFP, 1

	User-selectable optical modules: 1310nm, 1550nm STM-1e , STS-3 electrical port: BNC, 1 pair
Test Mode	Offline testing Online testing
Operation Mode	Point -to-point test mode Through mode Advanced pass-through mode: Ability to modify SOH/TOH overhead, insert bit errors and alarms
Frame structure	SDH : compliant with ITU-T G.707 SONET : Compliant with Telcordia GR-253
Line Coding	NRZ
Clock Reference	Internal clock accuracy: 4.6 ppm, optimal 2 ppm Frequency deviation: ± 50 ppm (1 ppm step) Recovered clock TTL level external 2.048MHz clock · E1: 2.048Mbps, DS1: 1.544Mbps
Receive signal rate	± 50 ppm Frequency deviation indication resolution: ± 1 ppm
TCM frame format	I TU-T G.783, G.707 Annex D and Annex E, POH byte : HP-N1/LP-N1/LP-N2 for SDH, Z5/Z6 for SONET TCM Access Point ID (Apid): 15- byte ASCII sequence, CRC-7
Scrambling	SDH : compliant with ITU-T G.707 SONET : Compliant with Telcordia GR-253

SDH Mapping



SONET Mapping



Alarm	<p>Alarm monitoring and generation</p> <ul style="list-style-type: none"> · SDH: LOS, LOF, OOF, MS-AIS, MS-RDI, AU-AIS, AU-LOP, HP-PLM, HP-UNEQ, HP-TIM, HP-RDI, TU-LOM, TU-AIS, TU-LOP, LP-PLM, LP-UNEQ, LP-TIM, LP-RDI, LP-RFI, LSS · SONET: LOS, LOF, OOF, AIS-L, RDI-L, AIS-P, LOP-P, TIM-P, PLM-P, UNEQ-P, RDI-P, LOM-V, AIS-V, LOP-V, PLM-V, UNEQ-V, RDI-V, TIM-V, LSS · TCM: TC-LTC, TC-TIM, TC-UNEQ, TC-AIS, TC-RDI, TC-ODI <p>Alarm generation method:</p> <ul style="list-style-type: none"> · continued · alternately · Sudden
Bit Error	<p>Error insertion and monitoring</p> <ul style="list-style-type: none"> · SDH: FAS, B1,B2,MS-REI,HP-B3, HP-REI, LP-B3,LP-BIP2,LP-REI, Bit Error · SONET: FAS, B1,B2,REI-L,B3, REI-P, B3-V,BIP2-V,REI-V, Bit Error · TCM: TC-IEC, TC-BIP2,TC-REI,TC-OEI <p>Error insertion method:</p> <ul style="list-style-type: none"> · continued · alternately · rate · single · Sudden

Bit test pattern	<p>Generation and detection of bulk test patterns based on ITU-T O.181</p> <p>Test pattern support: PRBS9, PRBS11, PRBS15, PRBS20, PRBS23, PRBS31</p> <p>The test pattern can be reversed</p> <p>User-defined pattern (pattern length: 16-bit step)</p>
Pointer	<p>Display pointer values on the sending and receiving sides</p> <p>Support pointer event monitoring and generation</p> <p>Support all G.783 pointer test sequences</p>
Expenses	<p>Generates segment overhead/transmission overhead and path overhead bytes</p> <p>Displays the current segment overhead/transmission overhead and channel overhead bytes</p> <p>All overhead can be decoded, including decoded J0, J1, J2 bytes</p> <p>Bit error test of all overhead or any specified overhead, such as DCC byte bit error test</p> <p>- frame overhead byte capture and decoding</p>
SDH tributary scanning	<p>Support DS1 signal embedding into VC-11</p> <p>Support E1 signal embedding into VC-12</p> <p>Support E2 signal embedding into VC-2</p> <p>Support E3/DS3 signal embedding into VC-3</p> <p>Support E4 signal embedding into VC-4</p>
SONET tributary scan	<p>Support DS1 signal embedded into VT1.5</p> <p>Support E1 signal embedding into VT2</p> <p>Support E3/DS3 signal embedding into STS-1</p> <p>Support E4 signal embedding into STS-3c</p>
Smart Scan	<p>Able to automatically scan remote SDH/SONET configuration information and automatically configure ports and mappings</p>
SDH/SONET Test Results	
State	<p>Current port information</p> <p>Monitor line alarms and errors</p> <p>Optical interface input level indication</p> <p>Input level indication of electrical interface</p> <p>Actual interface rate</p> <p>Frequency deviation</p>
Statistics	<p>Statistics: alarms (seconds and ratios), bit errors (count, number and ratio), pointer operations</p>
Histogram	<p>All alarms and errors can be displayed in graphic mode, allowing users to view all alarms and errors at a glance</p>
Error performance	<p>G.821/G.826/G.828/G.829 /M.2100/M.2110 analysis of received signals, based on detected bit errors and alarms: ES, SES, BBE, AS, UAS, EFS, etc.</p>
APS	<p>APS (Automatic Protection Switching) testing and analysis</p> <ul style="list-style-type: none"> Measure APS switching time. If it exceeds 50MS, it will be automatically judged as failure

	Trigger event() User can select all PDH/DSn, SDH/SONET alarms or errors, error thresholds, etc. Number of handovers indicated by the APS protocol K1/K2 byte setting and display APS switching time measurement resolution: 1us
Round trip delay measurement	Resolution: 0.1us Maximum test time: 10.0s

PDH/DSN test	
Test port	PDH: E1, E3, E4 1 DSn: 1 DS1, 1 DS3 Interface: BNC, RJ48 (only applicable to E1 interface test)
Test Mode	Offline testing Online testing
Standard	E1 : compliant with ITU-T G.703 2.048Mbps DS1: compliant with ANSI T1.102 1.544Mbps E3 : compliant with ITU-T G.703 34.368Mbps DS3: Compliant with ANSI 44.736M bps E4 : compliant with ITU-T G.703 139.264Mbps
Impedance	E1 : 75 Ω (unbalanced), 120 Ω (balanced) DS1: 100 Ω E3 : 75 Ω DS3 : 75 Ω E4 : 75 Ω
Line Coding	E1 : HDB3, AMI DS1: B8ZS, AMI E3 : HDB3 DS3: B3ZS, E4: CMI
Frame structure	E1 : Unframed , PCM30, PCM31, PCM30CRC, PCM31CRC DS1: Extraordinary Frame , SF-D4, ESF E3: non-frame, framing DS3: non-frame, framing E4: non-frame, framing
Clock Reference	Internal clock accuracy: 4.6 ppm Frequency deviation: ± 125 ppm (1 ppm step) Recovered clock TTL level external 2.048MHz clock · E1: 2.048Mbps, DS1: 1.544Mbps
Receive signal rate	± 150 ppm Frequency deviation display accuracy: ± 1 ppm
Test method	E1 : Terminal, monitoring DS1 : terminal, monitoring

	E3 : Terminal, Monitoring DS3 : Terminal, monitoring E4 : Terminal
Alarm	Alarm generation and monitoring · E1 : LOS, LOF, OOF, RAI, AIS, CRCLOFM, MFASOOF, LOFMFAS, MFASRAI, LSS · DS1: LOS, LOF, OOF, RAI, AIS, LSS E3 : LOS, LOF, AIS, RDI · DS3 : LOS, LOF, AIS, RAI, LSS, IDLE · E4 : LOS, LOF, AIS, RAI, LSS Alarm generation method: · continued · alternately · Sudden
Bit Error	Error insertion and monitoring · E1: FAS, CRC4, E-BIT, Code, Bit DS1: FAS, Code, Bit, CRC6 E3: FAS, Bit · DS3: FAS, C-BIT, P-BIT, FEBE, BIT E4: FAS, Bit Error insertion method: · continued · alternately · rate · single · Sudden
Bit pattern test	Generation and detection of bulk test patterns based on ITU-T O.181 Test pattern support: PRBS9, PRBS11, PRBS15, PRBS20, PRBS23, PRBS31 The test pattern can be reversed User-defined pattern (pattern length: 16-bit step)
PDH/DSN test results	
State	Current interface information Monitor line alarms and error display Input level display Actual interface rate Frequency deviation
Statistics	Statistics: alarm (seconds and ratio), bit errors (number, number and ratio), frequency deviation display
Histogram	All alarms and errors can be displayed in graphic mode, allowing users to view all alarms and errors at a glance
Error performance	M.2100 analysis of receiving models, based on detected errors and alarms: ES, SES, AS, UAS, EFS, etc.
APS	APS (Automatic Protection Switching) testing and analysis · Measure APS switching time. If it exceeds 50MS, it will be automatically

	judged as failure Trigger event() Users can select all PDH/DSn alarms or errors, error thresholds, etc. Number of handovers indicated by the APS protocol APS switching time measurement resolution: 1us
Round trip delay measurement	Resolution: 0.1us Maximum test time: 10.0s

Ordering Information

Model	Product Name
Host	
FT100	Intelligent, modular test platform
D240S	155M transmission analyzer, supports DS1/DS3, E1/E3/E4/STM-1 /OC-3 electrical port and STM -1/OC-3 optical port testing
D280S	622M transmission analyzer, supports DS1/DS3, E1/E3/E4/STM-1 /OC-3 electrical ports and STM -1/STM-4 , OC-3 /OC-12 optical port testing
D300S	2.5G transmission analyzer, supports DS1/DS3, E1/E3/E4/STM-1 /OC-3 electrical ports and STM -1/STM-4/STM-16 , OC-3 /OC-12/OC-48 optical port testing
Standard Accessories	
16080010	LC/PC full-duplex single-mode fiber optic test patch cord, 3 meters long, 1 piece
16060090	2M 75 ohm test cable, 1.5 meters long, 2 pieces
	RJ48 to BNC test patch cord, 1 pc
14020090	1.25G 1310nm 15km LC SFP optical module, suitable for OTM2515/OTM2516
14020350	2.5G 1310nm 15km LC SFP optical module for D300S
43170020	19V power adapter for FT100 platform .
16060010	2- meter power cable.
43160031	FT100 platform 2 parallel 4 series lithium-ion rechargeable battery
18080010	FT100 electronic CD-ROM.
19070010	FT100 instrument package.
	Three-year warranty for the main unit and one-year warranty for the adapter and battery
Software Options	
OPAP-OHSeqCapture	256 frames of SDH overhead
OPAP-TCM	TCM cascade test capability
Hardware Options	
43160031	FT100 platform 2 parallel 4 series lithium-ion rechargeable battery
14020350	2.5G SFP optical module, 1310nm , 15km , LX



14020380	2.5G SFP optical module, 1550nm , 80km , ZX
14020160	1.25G SFP optical module, 850nm , 550m , SX
14020090	1.25G SFP optical module, 1310nm , 15km , LX
14020340	1.25G SFP optical module, 1550nm , 40km , ZX

Applicable Scenarios

1. Operator STM16/OC48 backbone network commissioning and inspection
2. Maintenance and optimization of private network transmission systems for power, transportation, radio and television, etc.
3. R&D verification and consistency testing for transmission equipment manufacturers
4. Data Center Interconnect (DCI) Transmission Quality Assessment
5. Project delivery and fault location for a communications engineering company

Why choose D300S?

The D300S inherits all the features of traditional SDH/PDH testing while further enhancing test speed and intelligence. With high-speed support, intelligent scanning, and high-precision APS testing, the D300S helps users meet the challenges of high-speed and intelligent O&M in transmission networks, making it the optimal tool for future-oriented transmission network maintenance.

TFN