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Data Network Test & Inspection

E1 / 2M Datacom Analyzers & Testers

xDSL Analyzers & Testers

PCM Analyzers

IPTV Testers

Wuhan Sunma Technologies Co., LTD.

Table of Contents

Overview of SUNMA

Data Network Test & Inspection

E1 Datacom Analyzers & Testers

ST-9210 2M Transmission Analyzer.....	3
ST-9310 2M Transmission Performance Analyzer.....	6
ST-2138 Datacom Transmission Analyzer.....	10
ST-2135 E1 / Datacom Transmission Analyzer.....	12
ST-9101 Integrated E1 Bit Error Rate Tester.....	15
ST-2128 E1 BER Tester.....	16
ST-2125 E1 Transmission Analyzer.....	18

xDSL Analyzers & Testers

ST-701 Advanced ADSL2+ Analyzer.....	21
ST-2041 ADSL2+ Analyzer.....	23
ST-2048 New ADSL2+ Analyzer.....	25
ST-280 xDSL Line Tester	26
ST-332B Multi-functional ADSL2+ Tester.....	27
ST-330 Portable USB xDSL Tester.....	28

Others

ST-2038 PCM Channel Analyzer.....	29
ST-360 IPTV Tester.....	33

Overview of SUNMA

"WUHAN SUNMA TECHNOLOGIES CO., LTD.", one of the leading fiber optic product manufacturers in China, specialized in supplying fiber optic equipments, fiber optic test instruments and other data network & telecom products.



"SUNMA TECHNOLOGIES" was founded in 2002 by Mr. Sunder Ma. Our sale and manufacture center is located at Wuhan city, which is the only Fiber Optic Valley of China. The producing department locates at Guanshan District, and our sales office locates at Hongshan District of Wuhan.



Equipped with advanced hi-tech producing and testing equipments, staffed with a team of highly competent talents for R&D and quality inspection, SUNMA devoted to the development and application research of hi-tech products.



Administering the quality standard of CE, UL, ISO9001/14001 strictly. With the excellent pre & after sales service, professional knowledge, talented team and superior product quality, SUNMA have won a great reputation from our worldwide users.



In recent years, we are distributing the products of many renowned foreign test and measurement companies including Fujikura, EXFO, Agilent, JDSU, Furukawa, Anritsu, Sumitomo, Dillithium and Spotwave. Till now, our products cover Fiber Optic Telecommunication, Wireless, Datacom, Power, Cable TV measurement and utilities already.

"Seeking Excellent Quality to Win Opportunities, Providing Professional Solutions to Improve Service, Keeping Sincerely Cooperation to Create Future", SUNMA expect the pure honest cooperation with much more peoples of the world



Features:

- Handheld design and easy-to-use
- Full-featured measurements to E1, Datacom and Protocol Converter .
- High resolution backlit large LCD screen, with adjustable contrast
- Smart navigation mode and multi-languages displays
- Extensive error and alarm generation, detection and indication
- Histograms analysis of alarm and error events
- Up to 99 days continuance test performance
- Save/Recall of up to 10 user-defined setups and 10 sets of results
- Up to 6 hours operation from a single battery charge
- Built-in NiMH rechargeable batteries and smart charger circuit
- Can be charged with automobile cigarette lighter battery adapter
- Upgradeable software via an integrated USBinterface
- Test results uploaded, conserved and printed by TestManagerPro software

ST-9210 2M Transmission Analyzer

Introduction: The ST-9210 2M Transmission Analyzer is one multi-functional and full- featured digital transmission system test device, designed for the installation test, engineering check and acceptance, daily maintenance of digital networks, mainly performing channel test, alarm analysis, fault finding and signalling analysis. In addition, this instrument further provides various protocol converters with one-way and bi-directional bit error test function. These capabilities make it ideal for field use.

Basic Functions

1) E1 testing

- 75 Ω and 120 Ω line interfaces
- HDB3 and AMI line codes
- Out-of-service 2Mb/s, N*64kb/s BER testing
- In-service framed and unframed double-channel testing
- “PCM simulator” mode testing
- Frame data control and monitoring
- Timeslot activity monitoring
- Built-in 64kb/s tone channel listen capability
- CAS and CCS signaling generation and monitoring
- Round trip delay measurement
- APS delay measurement
- Extensive error and alarm generation
- VF tone generation and measurement
- Level measurement (Optional)
- Pulse mask measurement (Optional)
- Jitter measurements to ITU-T standard O.172 (Optional)
- Frequency and offset measurement
- Clock slip measurement
- Up to 999ppm transmit clock deviation
- Clock source: Internal, Interface or External 2M clock/signal
- Real-time transmit circuit open/short indication

2) Datacom testing

- Datacom (V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530 and EIA-530A) interfaces BER testing
- ASYNC BER testing with baud rate 50b/s vi |
- SYNC BER testing with data rate 1.2kb/s vi |
- DTE or DCE emulation
- SYNC clock source and sense selection
- Frequency measurement
- Handshaking signals control and monitoring

3) G.703 CO testing

- G.703 CO 64kb/s BER testing
- Octet timing control and monitoring
- Frequency and offset measurement
- Clock source: Internal, Interface
- SYNC clock source and sense selection
- Frequency measurement
- Handshaking signals control and monitoring

4) Protocol converter testing

- E1-Datacom SYNC 64k or N*64kb/s BER testing
- E1-G.703 CO SYNC 64kb/s BER testing
- Frequency and offset measurement
- Handshaking signals monitoring
- E1 frame data and alarm monitoring

5) Other functions

- Real-time clock
- Drop&Insert between E1 and Datacom
- Test pattern: PRBS, Fixed Code and 16-BIT User Word
- Error injection: Single and Fixed Rate
- Manual and auto-timer measurement
- ITU-T G.821, G.826, and M.2100 performance analysis
- Self-check and keyboard testing function

Specifications:

Item	Description		
2M	Internal Clock	2048kb/s ± 10ppm	
	Frequency Deviation	±999ppm	
	Line Interface	75Ω (Unbalanced), 120Ω (Balanced); High Input Impedance >2KW	
	Line Code	HDB3, AMI	
	Framing	Unframed, PCM30, PCM30CRC, PCM31, PCM31CRC	
	Receive Sensitivity	> -43dB	
	Tx Clock Source	Internal, Interface and External 2MHz clock or signal	
	Pulse Mask Measurement	Comply with G.703	
	Jitter Measurement (optional)	Comply with O.172	
	Frequency Measurement	Accuracy: ±1Hz	
	Offset Measurement	Accuracy: ±1ppm Range: -999ppm to +999ppm	
	VF Measurement	Frequency: 200Hz to 3400Hz, Accuracy: ±1Hz	
		Level range :-60.00dBm to +3.14dBm, -60.00dBm to -21.00dBm, accuracy: ±2.87dBm -20.00dBm to +3.14dBm, accuracy: ±0.21dBm	
	Delay Measurement	Accuracy: ±1 μs	
G.703 CO (Optional)	Line Rate	64kb/s 100ppm	
	Line Interface	120Ω, Balanced	
	Line Code	AMI	
Datacom	Line Interfaces	V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530, EIA-530A	
	Data Rate	ASYNC	300,600bit/s, 1.2,2.4,4.8,7.2,9.6,19.2,38.4kb/s
SYNC		300, 600bit/s, 1.2, 2.4, 4.8, 7.2, 9.6, 19.2, 38.4kb/s, N×64kb/s (N=1- 32),4M,8Mkb/s	
Test Patterns	PRBS	2 ^m -1, 2 ^{m-1} -1, 2 ^{m-1} -1, 2 ^{m-1} -1, 2 ^{m-1} -1	
	Fixed Code	1111, 0000, 1010	
	16-BIT	User Programmable Word	
LED Alarm Indicators Signal Loss, AIS, Frame Loss, MFrame Loss, Pattern Loss, Remote Alarm, Error, Clock Slip			
Error Injection	Type: BIT, FAS, CRC4, CODE, E-BIT		
	Single, Fixed Rate : 10 ³ , 10 ⁴ , 10 ⁵ , 10 ⁶ , 10 ⁷		
Performance Analysis	ITU-T G.821, G.826 and M.2100		
Display	320x240 pixel backlit monochromatic LCD		
Serial Port	RS232 (USB 2.0 option)		
Rechargeable Batteries	Li batteries, continuous working for 6 hours		
Recharge Time	Approx. 2 hours		
AC Power Adapter	Input: 100V to 240V AC, 50/60Hz Output: 9V DC/2A		
TestManager Pro	WIN98/ME/NT/2000/XP		



Dimensions	L×W×H (200mm × 160mm × 45mm)
Operating Temperature	0°C-50°C
Storage Temperature	-20°C-70°C
Humidity	5%-95% non-condensing

Standard Accessories:

Standard Items	Unit	Qty	Standard Items	Unit	Qty
TLP-3C 2M Transmission Analyzer	Pcs.	1	Simulation software	Pcs.	1
75Ω BNC/L9 E1 test cable	Pcs.	2	Carrying case	Pcs.	2
BNC/BNC cable	Pcs.	1	User's manual	Pcs.	1
RS232 serial upgrading cable	Pcs.	1	Warranty card	Pcs.	1
DATA converting line(36PIN to 44PIN)	Pcs.	1	Certificate of conformity	Pcs.	1
X.21 testing line	Pcs.	1	V.35 testing line	Pcs.	1
V.24 testing line	Pcs.	1	V.11 testing line	Pcs.	1
			AC adapter	Pcs.	1

Optional Functions:

Jitter Measurement			Colored Screen		
G. 703 CO Measurement			64K testing lines		

Optional Accessories:

120 Ω testing line	Pcs.	2			
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ST-9310 2M Transmission Performance Analyzer

ST-9310 2M Transmission Analyzers is mainly used for measuring of the error rate of data communication and for the analysis of line fault and causes, and very suitable for the parameter measurement and routine maintenance testing of 2M system, N×64K communication channels.

ST-9310 Series 2M Transmission Analyzers can be used to test the digital channels with 2Mbit/s interfaces and with V.24/V.28/RS232, V.35, V.36, RS449, X.21, RS485, EIA530, EIA530A, and equidirectional 64kbit/s interfaces.

Major Functions

For 2Mbit/s:

Key Features:

- LCD large-screen display, 320*240 lattice, backlight, LED indicator
- Hand held, auto configuration
- Multi-task operation at one time
- Store 20 test results and 9 test configurations, with power-off memories
- PC operation, store, analysis, print
- Programmable timer
- Alarm and histogram analysis
- Software updating

- Service-interrupted error testing
- Online error testing
- Framed and unframed signals generation and reception
- 2Mbit/s unframed error performance testing
- 2Mbit/s framed N×64kbit/s channel error testing
- Bit error, coding error, frame error, CRC error and E bit error testing
- Signal loss alarm, AIS alarm, framed remote alarm, multi-framed remote alarm, out-of-frame, and pattern loss alarm
- Frequency offset testing
- Line signal level and frequency testing
- Voice channel signal level and frequency testing
- Pattern slip testing
- Clock slip testing
- Straightforward signaling
- Audio frequency testing
- Loop circuit delay testing
- Automatic protection switching time testing (APS)
- Clock bias function
- Sound monitoring
- Duplex 2Mbit/s detecting and monitoring
- Signal state display, Voice channel content display, Voice channel busy indication
- Alarm and error histogram analysis
- Time slot content analysis, drop and insert signal on each time slot
- Framed content analysis
- G.703 module analysis
- G. 821/G. 826/M. 2100 error analysis
- Multi error and alarm inserting
- Three input modes (terminating, bridging and monitoring)
- Three clock options (internal, external and picking-up)

For Datacom:

- V.24/RS232/V.28, V.35, V.36, X.21, RS-449, RS-485, RS422, EIA-530, EIA-530A datacom testing
- SYNCH and ASYNCH testing
- DTE and DCE emulation
- Bit code testing
- Pattern slip testing
- Signal loss alarm
- Line signal level and frequency testing
- Loop delay testing
- Automatic protection switching time testing(APS)
- G.821, M2100 service interrupt error testing

For co-directional 64Kbit/s:

- Service interrupt error testing
- Bit code testing
- Pattern slip testing
- Signal loss, AIS alarm
- Line signal frequency testing
- Loop delay testing
- Automatic protection switching time testing(APS)
- G.821, M.2100 error testing

Technical Index

2M Technical Index

- (1) Signal input rate: 2048kbit/s±100ppm (G.703 requirement±50PPM)
- (2) Signal coding: HDB3, AMI.
- (3) Input jitter tolerance: Up to the requirement of Figure 10.1.

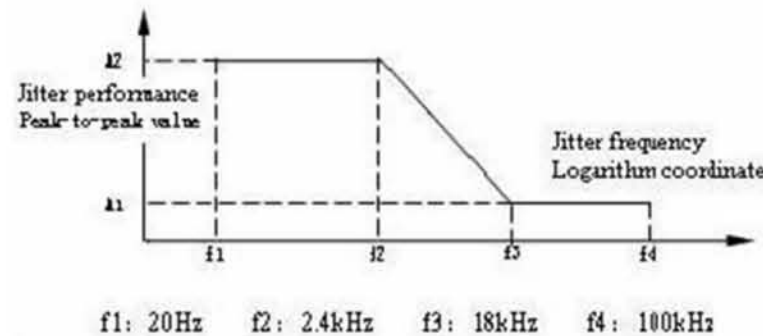


Fig.10.1 Input Jitter Tolerance

- (4) Input balance response: Attenuation complies with the law of square root of frequency, and is within the range of 0 to 6dB at 1024 kHz.
- (5) Input Impedance
 - (5.1) Unbalance terminating: 75Ω Balance terminating: 120Ω. Reflection loss >18dB within 50Hz~3100kHz.
 - (5.2) Unbalance bridging: >750Ω Balance bridging: >1200Ω
 - (5.3) Unbalance monitoring: 75Ω, 26dB gain

- (6) Signal structure
 - (6.1) Non-frame structure
 - (6.2) Frame structure: PCM30, PCM31, PCM30CRC, PCM31CRC. Frame structure complies with the requirement of G. 704.
- (7) Testing pattern: 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, and artificial code
- (8) Impedance of output interface: (8.1) Non-balance 75Ω, up to G. 703 (8.2) Balance 120Ω, up to G. 703.
- (9) External clock input
 - (9.1) Signal form: HDB3, NRZ
 - (9.2) Balance terminating resistance: 120Ω Unbalance terminating resistance: 75Ω. Balance bridging resistance: >1200Ω Unbalance bridging resistance: >750Ω.
- (10) Error code insertion: None, single, or ratio 10-1 ~ 10-7.

Co-directional 64k Technical Index:

- (1) Signal input rate: 64 kbit/s±100ppm (G.703 requirement±100PPM)
- (2) Input impedance: Balance 120Ω, up to G.703
- (3) Input jitter tolerance: Up to G.823.
- (4) Impedance of output interface: Balance 120Ω, up to G.703
- (5) Testing pattern: Testing pattern: 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, 2⁻¹, and artificial code

Datacom Index

- (1) Data interface type: V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530 and EIA-530A.
- (2) Generator
 - (2.1) SYNCH mode
Clock source: Internal or external clock
Phase relation between clock and data: co-direction or reverse direction.
Rate: 1.2,2.4,4.8,9.6,14.4,19.2,38.4,48, 56(kbps); N×64kbps(N=1~32)
Error: ±15ppm (ppm: parts per million)
 - (2.2) ASYNCH mode
Rate:
50,75,110,150,200, 300,600,1200,2400,3600,4800,7200,9600;14.4k, 19.2k, 38.4k,57.6k (bps)
Data structure: Word length: 5,6,7,8(bits);Stop bit: 1,2 (bits) ;
Odd-even check: odd, even, 1, 0, none
 - (2.3) Error code insertion: None, single, or ratio 10-1 ~ 10-7.
- (3) Receiver
 - (3.1) SYNCH mode
Clock source: Internal or external clock
Phase relation between receive clock and receive data: Equidirection or

(4) Testing pattern: 2²-1、2²-1、2¹-1、2¹-1、2²1、2²1, and artificial code

Other Parameters

Power supply

- (1) Special power adapter
Input: AC220V 50Hz
Output: DC 9V 1A
- (2) Internal rechargeable battery
4000mAh, 6V nickel-hydrogen rechargeable battery
Working time: 8 hours
Charging: 8 hours at power-off state, and 12 hours at power-on state.

Dimension and weight

L×W×H: 200×160×42mm
Weight: 950g

Ambient parameters

Operation temperature: 0~40℃
Storage Temperature: -30~+70℃
Humidity: 5%~90%, non-condensing

Other Parameters

No	Item	Qty
1	ST-9310 2M Transmission Analyzers	1 set
Attached files		
2	User's manual	1 pc
3	Software disc	1 pc
4	75Ω Coaxial testing line	1 pc
5	BNC-L9 Testing line CESHYI	2 pcs
6	RS232 serial line	1 pc
7	Special testing cable of data communication I (V.24,RS-485,EIA-530,EIA-530A)	1 pc
8	Special testing cable of data communication II (RS-449, V.36)	1 pc
9	Special testing cable of data communication III(X.21)	1 pc
10	Special testing cable of data communication IV(V.35)	1 pc
11	G.703 CO special testing cable(64Kb/s coaxial interface)	1 pc
12	Power adapter	1 pc
13	Data self-loop head	1 pc
14	Switch cable	1 pc
15	Handy-case	1 pc
16	Serial printing line(optional)	1 pc



ST-2138 Datacom Transmission Analyzer

The ST-2138 Datacom Transmission Analyzer is a low-cost handheld instrument. It is widely used to identify and verify quality-of-service of datacom (V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530 and EIA-530A) transmission channels in Access Network, Transmission Network, Digital Data Network (DDN) and some private communication networks. ST-2028 is intended to meet the demands of R&D, production, equipment installation, check and approval, daily maintenance and service verification.

Basic Functions

- Bit error test of DATACOM (V family, X family, RS family, EIA family) interfaces.
- DATACOM (V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530 and EIA-530A) interfaces can be configured with DTE or DCE, ASYNC or SYNC mode.
- Monitor and control handshaking signals.
- BAUD Rate: 50b/s~38.4Kb/s, N 4Kbit/s (N=1~32).
- In SYNC test mode, Rx and Tx clock sources are selectable with internal or external and rising or falling edge sense.
- Error injection: Single, Fixed Rate, OFF.
- Measurements of errored blocks and clock slips.
- Real-time Clock.
- Performance analysis in accordance with ITU-T G.821.
- 12 LEDs alarm and status indicators.
- The test results can be uploaded to PC via the serial port. And TestManager software could do further analysis, assembling, filing, and report outputting of the test results.
- On-line embedded software upgrading.

Features

- Handheld structure, durable design, suitable for carrying around and on-spot measurements.
- High resolution backlight LCD, smart navigation mode operation displays in English.
- Synchronization performance measurements give references to the more and more important system synchronization problem.
- Perfect alarm detections and indications.
- Up to 99 days continuance test performance.
- Built-in NIMH rechargeable batteries and embedded with smart fast charger circuit.
- Can be charged with automobile cigarette lighter battery adapter.
- High storages capacity, can store 4 groups of test results including settings and results information.
- Real-time clock and storages could be kept during a long time by power supply of the second spare battery without AC adapter and built-in NIMH battery module.
- By using TestManager software, upgrading the embedded software of the instruments via the serial port to perfect the functionalities of the instrument and protect your investment.

Basic Functions

Hardware	Qua.	Software	Qua.
ST-2138 Datacom Transmission Analyzer	1	TestManager Setup CD	1
AC Power Adapter	1	Waterproof Package	1
Automobile Cigarette Lighter Battery Adapter Cable	1	Users Manual	1
RS232 Communication Cable	1	Maintenance Card	1
AA NIMH Rechargeable Batteries	5	Quality Certificate Card	1
Datacom Adapter Cable	4	Packing List	1
Datacom Interfaces Loop-back Adapter	1		1

Standard Accessories:

Item	Description	
DATACOM	Interfaces (Db44)	V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530, EIA-530A
	BAUD Rate	ASYNC 50, 75, 150, 300, 600bit/s, 1.2, 2.4, 4.8, 9.6, 19.2Kb/s
		SYNC 1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 56Kb/s, N 4Kb/s (N=1~32)
Test Patterns	PRBS	223-1, 215-1, 211-1, 29-1
	Fixed Code	1111, 0000, 1010
	16BIT	16 bit programmable word
Alarm Indicators	SIGNAL LOSS, AIS, ERROR, PATTERN LOSS, CLOCK SLIP	
Error Injection	Single, OFF, Fixed Rate: 10-2, 10-3, 10-4, 10-5, 10-6, 10-7	
Performance Analysis	ITU-T G.821	
Serial Port	V.24/RS-232	
Batteries	5 .2V AA NIMH batteries, continuous working for 10 hours	
Recharging Time	Embed fast re-charger, recharging time 1.5 hours, finish recharging automatically when being full charged.	
AC Power Adapter	Input: AC 100V-240V, 50/60Hz Output: DC 12V/1.5A	
TestManager	Operating System for PC: WIN98/ME/2000/XP/NT	
Dimensions	L 243mm/128mm/30mm	
Weight	700g	



ST-2135 E1 / Datacom Transmission Analyzer

ST-2135 E1/Datacom Transmission Analyzer is one multi-functional and full- featured digital transmission system test device, designed for the installation test, engineering check and acceptance, daily maintenance of digital networks, mainly performing channel test, alarm analysis, fault finding and signalling analysis. In addition, this instrument further provides various protocol converters with one-way and bi-directional bit error test function. These capabilities make it ideal for field use.

Basic Functions

1) E1 testing

- 75 Ω and 120 Ω line interfaces
- HDB3 and AMI line codes
- Out-of-service 2Mb/s, N 64kb/s BER testing
- In-service framed and unframed double-channel testing
- "PCM simulator" mode testing
- Frame data control and monitoring
- Timeslot activity monitoring
- Built-in 64kb/s tone channel listen capability
- CAS and CCS signaling generation and monitoring
- Round trip delay measurement
- APS delay measurement
- Extensive error and alarm generation
- VF tone generation and measurement
- Level measurement (Optional)
- Pulse mask measurement (Optional)
- Jitter measurements to ITU-T standard O.172 (Optional)
- Frequency and offset measurement
- Clock slip measurement
- Up to 999ppm transmit clock deviation
- Clock source: Internal, Interface or External 2M clock/signal
- Real-time transmit circuit open/short indication

2) Datacom testing

- Datacom (V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530 and EIA-530A) interfaces BER testing
- ASYNC BER testing with baud rate 50b/s vi 57.6b/s
- SYNC BER testing with data rate 1.2kb/s vi 2.048Mb/s
- DTE or DCE emulation
- SYNC clock source and sense selection
- Frequency measurement
- Handshaking signals control and monitoring

Main Features

- Handheld design and easy-to-use
- Full-featured measurements to E1, Datacom and Protocol Converter
- High resolution backlit large LCD screen, with adjustable contrast
- Smart navigation mode and multi-languages displays
- Extensive error and alarm generation, detection and indication
- Histograms analysis of alarm and error events
- Up to 99 days continuance test performance
- Save/Recall of up to 10 user-defined setups and 10 sets of results
- Up to 6 hours operation from a single battery charge
- Built-in NIMH rechargeable batteries and smart charger circuit
- Can be charged with automobile cigarette lighter battery adapter
- Upgradeable software via an integrated USBinterface
- Test results uploaded, conserved and printed by TestManagerPro software

3) G.703 CO testing

- G.703 CO 64kb/s BER testing
- Octet timing control and monitoring
- Frequency and offset measurement
- Clock source: Internal, Interface

4) Protocol converter testing

- E1-Datacom SYNC 64k or N 64kb/s BER testing
- E1-G.703 CO SYNC 64kb/s BER testing
- Frequency and offset measurement
- Handshaking signals monitoring
- E1 frame data and alarm monitoring

5) Other functions

- Real-time clock
- Drop&Insert between E1 and Datacom
- Test pattern: PRBS, Fixed Code and 16-BIT User Word
- Error injection: Single and Fixed Rate
- Manual and auto-timer measurement
- ITU-T G.821, G.826, and M.2100 performance analysis
- Self-check and keyboard testing function

Main Features

Standard configuration list of the E1/Datacom Transmission Analyzer:

Item	Qua.	Item	Qua.
E1/Datacom Transmission Analyzer	1	Users Manual	1
AC Power Adapter	1	TestManagerPro Setup CD	1
Automobile Cigarette Lighter Battery Adapter Cable	2	AA NIMH Rechargeable Batteries (Built-In)	5
E1 75 Ω Unbalanced Test Cable	1	Waterproof Package	1
E1 120 Ω Balanced Test Cable	4	Quality Certificate Card	1
Datacom Adapter Cables	1	Quality Certificate Card	1
Datacom Interfaces Loop-back Adapter	1	Packing List	1
USB Communication Cable	1	Quality Certificate Card	1

Item	Description	
E1	Internal Clock	2048kb/s ±10ppm
	Frequency Deviation	999ppm
	Line Interface	75 Ω (Unbalanced), 120 Ω (Balanced); High Input Impedance >2KW
	Line Code	HDB3, AMI
	Framing	Unframed, PCM30, PCM30CRC, PCM31, PCM31CRC
	Receive Sensitivity	> -43dB

E1	Tx Clock Source	Internal, Interface and External 2MHz clock or signal		
	Pulse Mask Measurement	Comply with G.703		
	Jitter Measurement	Comply with O.172		
	Frequency Measurement	Accuracy: 1Hz		
	Offset Measurement	Accuracy: 1ppm; Range: -999ppm vi +999ppm		
	VF Injection	Frequency: 200Hz vi 3400Hz, Step: 10Hz		
		Level: -60dBm vi +3dBm		
	VF Measurement	Frequency: 200Hz vi 3400Hz, Accuracy: 1Hz		
Level range : -60.00dBm vi +3.14dBm -60.00dBm vi -21.00dBm, accuracy: 2.87dBm -20.00dBm vi +3.14dBm, accuracy: 0.21dBm				
Delay Measurement	Accuracy: 1			
G.703 CO	Line Rate	64kb/s 100ppm		
	Line Interface	120 Ω , Balanced		
	Line Code	AMI		
Datacom	Line Interfaces	V.24, V.35, V.36, X.21, RS-449, RS-485, EIA-530, EIA-530A		
	Data Rate	ASYNCR	50, 75, 150, 300, 600bit/s, 1.2, 2.4, 4.8, 7.2, 9.6, 19.2, 38.4, 57.6kb/s	
Test Patterns	PRBS	223-1, 220-1, 215-1, 211-1, 29-1, 26-1		
	Fixed Code	1111, 0000, 1010		
	16-BIT	User Programmable Word		
LED Alarm Indicators	Signal Loss, AIS, Frame Loss, MFrame Loss, Pattern Loss, Remote Alarm, Error, Clock Slip, Octet Loss, Low Battery			
Error Injection	Type: BIT, FAS, CRC4, CODE, E-BIT			
	Single, Fixed Rate : 10-2, 10-3, 10-4, 10-5, 10-6, 10-7			
Performance Analysis	ITU-T G.821, G.826 and M.2100			
Display	320x240 pixel backlit monochromatic LCD			
Serial Port	USB 2.0 Connector			
Rechargeable Batteries	5*1.2V AA NIMH batteries, continuous working for 6 hours			
Recharge Time	Approx. 2 hours			
AC Power Adapter	Input: 100V vi 240VAC, 50/60Hz Output: 12VDC/1.5A			
TestManager Pro	WIN98/ME/2000/XP/NT			
Dimensions	L*W*H 266mm * 90/144mm * 60mm			
Operating Temperature	0°C vi 50°C			
Storage Temperature	-20°C vi 70°C			
Humidity	5% vi 95% non-condensing			
Weight	Approx. 800g			



Features

- Handheld design and easy-to-use
- Hand-held structure, solid design, especially suitable for the fieldwork
- LCD display with backlight, menu operation
- Be able to carry out continuous test up to 30 days
- Error bit test, time-slot test
- Rechargeable nickel hydride batteries and integrated intellectualized circuit, which carry out the quick charge during operation
- Powered by Ni-MH rechargeable batteries and integrated with smart fast charging circuit inside
- Large memory able to store groups of measurement results which will remain when power off

ST-9101 Integrated E1 Bit Error Rate Tester

ST-9101 Integrated E1 Bit Error Rate Tester is a hand-held communication equipment of the international standard, which is approved by telecommunication measuring center of the Ministry of Information Industry. This product is applicable to telecommunication access networks, transmission networks and the start-up, check and maintenance of optical and data communication systems.

Basic Functions

- Out of service test/in-service test
- Framed/unframed test
- 2Mb/s, N*64Kb/s test
- Times lot voice monitor function
- Single error code insertion, ratio error code insertion
- LED alarm and status indicator
- Real-time clock
- Result analysis conforms to the ITU-TG.821, G.826 and M.2100 standards
- Measurement results can be printed via external serial port printer

Specifications:

Item	Description
Bit rate	2084Kb/s ±50ppm
Connector	75ohm, high resistance input impedance≤2000ohm
Input sensitivity	0~ - 43dB
Circuitry code	HDB3
Frame type	Framed/unframed
Frame pattern	PCM30, PCM30CRC, PCM31, PCM31CRC
Test pattern	Random pseudocode: 2 ¹⁵ -1, 2 ¹¹ -1 Fixed code: 1111,0000, 1010
Alarm indicator and check	Signal Loss, AIS, Frame Loss, MF Remote Alarm, CRC Error, Patten Loss, Remote Alarm
Error code insertion	Single error code insertion Ratio error code insertion: 10E-3,10E-6
Result analysis	Conforms to the ITU-T, G.821, G.826 and M.2100 standards
Serial interface	RS-232
Rechargeable batteries	6*1.2V AA Ni-MH rechargeable batteries, for 8-hour continuous test, Built-in smart fast charger, 4.5 charging hours
External power supply	AC adapter, DC 12V/1.5A
Dimensions(mm)	224L*110W*50H
Weight(g)	About 700

Ordering Information:

Standard Accessories:
AC/DC Adapter, 75Ω unbalance test cable, User Guide Manual, Carrying bag, Test Report
Optical Accessories:
Printer, 75Ω unbalance/120Ω balance converter



Features

- Handheld design, dapper design and easy-to-use
- High resolution backlit LCD
- Smart navigation mode displays Self-check and keyboard testing function
- Extensive error and alarm generation, detection and indication
- Histograms analysis of alarm and error events
- Up to 99 days continuous test performance
- Save/Recall of up to 7 user-defined setups and 10 sets of results
- Up to 8 hours operation from a single battery charge
- Built-in Li rechargeable batteries and smart charger circuit
- Upgradeable software via an integrated USB interface
- Test results could be output or printed with A4-size report form by TestManagerPro software

ST-2128 E1 BER Tester

ST-2128 E1 BER tester is a small and muni-functional handheld E1 line test instrument which is to do BER test, frame analysis, time slot analysis, signaling test, sign analysis, alarm analysis and so on. It is not only durable and easy to use, but also has high performance-to-providing ratio, especially for simplifies installation and maintenance testing for faster problem resolution.

Basic Functions

- Single error code insertion, ratio error code insertion
- 120Ω and 75Ω line interfaces
- HDB3 and AMI line codes
- Out-of-service framed and unframed testing
- 2Mb/s, N×64Kb/s BER testing
- Frame data and alarm monitoring
- Clock slip measurement
- Frequency and level measurement
- Clock source: Internal, Interface
- Testing pattern: PRBS, Fix Code, 16-BIT User Word
- Error injection: Single and Fixed Rate
- Real-time transmit circuit open/short indication
- Manual and auto-timer measurement
- G.821, G.826, and M.2100 performance analysis
- Test results uploaded, conserved and printed by TestManagerPro

Specifications:

- In-service framed and unframed testing
- Hi-Z and through mode testing
- CODE, FAS, CRC4, E-BIT BER testing
- Frame data and timeslot activity monitoring
- CAS and CCS signaling monitoring

Configuration List

Item	Qua.	Item	Qua.
ST-2128 E1 BER Tester	1	TestManagerPro Software CD	1
AC Power Adaptor	1	Waterproof Package	1
75 Ω Unbalanced Test Cable	2	User's Manual	1
120 Ω Balanced Test Cable	1	Quality Certificate Card	1
Rechargeable Li Battery	1	Maintenance Card	1
USB Communication Cable	1	Packing List	1

Specifications:

Item	Description	
Internal Clock	2048Kb/s ± 10ppm	
Line Interfaces	75Ω(Unbalanced),120Ω(Balanced);*High Input Impedance >2KΩ	
Line Code	HDB3, AMI	
Framing	Unframed, PCM30, PCM30CRC, PCM31, PCM31CRC	
Level Measurement	-43dB ~ -2.5dB	
Tx Clock Source	Internal, Interface	
Frequency Measurement	Accuracy: ±1Hz	
Offset Measurement	Accuracy: ±1ppm ;Range: -999ppm ~ +999ppm	
	Test Patterns	PRBS 2 ⁿ -1, 2 ⁿ⁻¹ -1, 2 ⁿ⁻² -1, 2 ⁿ⁻³ -1
	Fixed Code	1111, 0000, 1010
	16-BIT	User Programmable Word
Alarm Indications	Signal Loss, AIS, Frame Loss, MFrame loss, Pattern Loss, Remote Alarm, Errors, Low Battery	
Error Injection	Type: BIT, FAS, CODE, CRC4, E-BIT	
	Single, Fixed Rate: 10 ⁰ , 10 ¹ , 10 ² , 10 ³ , 10 ⁴ , 10 ⁵	
Performance Analysis	ITU-T G.821, G.826 and M.2100	
Serial Port	USB 2.0 Connector	
Rechargeable Batteries	7.4V Li battery, continuous working for 8 hours	
Recharge Time	Approx. 2 hours	
AC Power Adapter	Input: 100V ~ 240VAC, 50/60Hz;Output: 12VDC /1.5A	
TestManager™	Operating System: WIN98/ME/2000/NT/XP	
Dimensions	L×W×H 230mm×72/116mm×33mm	
Weight	Approx. 500g	

Remark:* means option



ST-2125 E1 Transmission Analyzer

ST-2125 E1 Transmission Analyzer is a powerful handheld instrument, providing a scalable, future-proof solution for the testing needs of technicians involved in the installation and maintenance of E1 digital networks. It offers full-featured the error and alarm measurements you will need to verify quality-of-service in your networks. Plus, signal quality measurements including frequency, level, pulse shape, jitter and other functions ensure your costly, time-consuming work performed quickly and efficiently.

Basic Functions

- HDB3 and AMI line codes
- 75Ω(Unbalanced),120Ω(Balanced) and high impedance line interfaces
- Out-of-service framed/unframed testing ("TX/RX" mode):
 - 2Mb/s, N×64kb/s BER testing
 - Monitoring: Signal Loss, AIS, Frame Loss, Remote Alarm, Remote MF Alarm, CRC MF Loss, CAS MF Loss, Pattern Loss alarms and BIT, Code, FAS, CRC-4, E-BIT errors
 - Clock slips measurement
- In-service framed/unframed testing ("RX HI-Z" and "Through" mode):
 - Rx HI-Z and through mode testing
 - Code, FAS, CRC-4 and E-BIT BER testing
 - FAS/NFAS, MFAS/NMFAS, timeslot activity monitoring
 - Timeslot data monitoring
 - Built-in 64kb/s tone channel listen capability
 - CAS and CCS signalling monitoring
- Round trip delay measurement
- APS delay measurement
- PCM simulator:
 - Extensive alarm and error generation
 - Frame data Si, Sa, A, FAS, CRC-4, MFAS, NMFAS and E-BIT control and monitoring
 - Idle word timeslot insertion
 - VF tone generation and measurement
 - CAS and CCS signalling generation and monitoring
- Frequency and offset measurement
- Clock slips measurement
- Up to ±999 ppm transmit clock deviation
- Double E1 channels in-service monitoring Option1
 - Double E1 channels Rx HI-Z and through mode testing
 - Double E1 channels Code, FAS, CRC-4, E-BIT BER testing
 - Double E1 channels FAS/NFAS, CAS Multiframe, CCS timeslot 16 and timeslot activity monitoring
 - Double E1 channels timeslot data monitoring
 - Double E1 channels built-in 64kb/s tone channel listen capability
 - Double E1 channels CAS and CCS signalling monitoring
- Pulse mask measurement Option2
 - Input E1 pulse shape display
 - Pulse width measurement

Main Features

- Handheld design and easy-to-use
- Full-featured measurements to E1 signals
- High resolution large backlit and contrast-adjustable LCD
- Smart navigation mode displays
- Extensive error and alarm generation, detection and indication
- Up to 6 hours operation from a single battery charge
- Up to 99 days continuance test performance
- Save/Recall of up to 10 user-defined setups and results
- Built-in NIMH rechargeable batteries and smart charger circuit
- Can be charged with automobile cigarette lighter battery adapter
- Test results could be uploaded, conserved by TestManagerPro
- The stored results could be output or printed with A4-size report form, Excel and test files

- HDB3 and AMI line codes
 - ±Pulse width and amplitude ratio measurement
 - Rising edge and falling edge time measurement
 - Overshoot and undershoot ratio measurement
 - Pulse amplitude and level measurement
- Jitter measurement Option3
 - Peak-peak jitter measurement
 - Jitter measurement comply with O.172 filter (18-100kHz)
 - Hit seconds and hit free seconds counts
- Level measurement Option4
 - ±Pulse level real-time measurement
 - Peak-peak pulse level measurement
- Transmit clock sourced from external clock or signal Option1
- Real-time transmit circuit open/short indication
- Autoconfigure function:
 - E1 frame format auto-detection and autoconfiguration
 - BERT pattern auto-detection and autoconfiguration
 - The timeslots carried BERT pattern auto-detection and autoconfiguration
- Real-time clock
- BERT pattern: PRBS, Fixed Code, 16-BIT User Word
- Error injection: Single and Fixed Rate
- Reset the results to zero function
- Manual and auto-timer testing
- Self-check, keyboard and LED testing
- TU-T G.821, G.826 and M.2100 performance analysis
- Histograms analysis of error and alarm events
- Upgradeable embedded software via an RS232C interface

Configurations

Standard configuration list of the E1/Datacom Transmission Analyzer:

Item	Qua.	Item	Qua.
E1 Transmission Analyzer	1	TestManagerPro Setup CD	1
AC Power Adapter	1	AA NIMH Rechargeable Batteries (Built-In)	5
Automobile Cigarette Lighter Battery Adapter Cable	1	Waterproof Package	1
E1 75 Ω Unbalanced Test Cable	2	Quality Certificate Card	1
E1 120 Ω Balanced Test Cable	1	Maintenance Card	1
USB Communication Cable	1	Packing List	1
Users Manual	1		

Optional configuration list of the E1 Transmission Analyzer:

Code	Option Name	Acquired Way	Additional Accessories	Qua
Option1	Double E1 channels monitoring and E1 External Clock	Add-on Hardware and Authorized Software	Hardware Module	1
			External Clock Access Cable	1
			Double E1 Channels Monitoring Test Cable	1
			Embedded Software and Function Control Code	1
Option2	Pulse Mask Measurement	Authorized Software	Embedded Software and Function Control Code	1
Option3	Jitter Measurement	Authorized Software	Embedded Software and Function Control Code	1
Option4	Level	Authorized	Embedded Software and	1

Basic Functions

Item	Descriptions	
Internal Clock	2048Kb/s ± 10ppm	
Frequency Deviation	±999ppm	
Line Interfaces	75Ω(Unbalanced), 120Ω(Balanced; High Input Impedance >2KW)	
Line Code	HDB3, AMI	
Framing	Unframed, PCM30, PCM30CRC, PCM31, PCM31CRC	
Receive Sensitivity	> -43dB	
Tx Clock Source	Internal, Interface and External 2MHz clock or HDB3 signal	
Pulse Mask Measurement	Comply with G.703	
Jitter Measurement	Comply with O.172	
Frequency measurement	Accuracy: ±1Hz	
Offset Measurement	Accuracy: ±1ppm; Range: -999ppm ~ +999ppm	
VF Injection	Frequency: 200Hz ~ 3400Hz, Step: 10Hz	
	Level: -60dBm ~ +3dBm	
VF Measurement	Frequency: 200Hz ~ 3400Hz, Accuracy: ±1Hz	
	Level range : -60.00dBm ~ +3.14dBm; -60.00dBm ~ -21.00dBm, accuracy: ±2.87dBm -20.00dBm ~ +3.14dBm, accuracy: ±0.21dBm	
Delay Measurement	Accuracy: ±1 μs	
Test Patterns	PRBS	223-1, 215-1, 211-1, 29-1
	Fixed Code	1111, 0000, 1010
	16-BIT	User Programmable Word
Alarm Indications	Signal Loss, AIS, Frame Loss, MFrame loss, Pattern Loss, Remote Alarm, Remote MF Alarm, Errors, Clock Slip, Low Battery	
Error Injection	Type: BIT, FAS, CODE, CRC4, E-BIT	
	Single, Fixed Rate: 10-2, 10-3, 10-4, 10-5, 10-6, 10-7	
Alarm injection	AIS, Frame Loss, CAS and CRC MFrame Loss, Remote Alarm, Remote MFrame Alarm	
Performance Analysis	ITU-T G.821, G.826 and M.2100	
Display	320x240 pixel backlit monochromatic LCD	
Serial Port	USB 2.0 Connector	
Rechargeable Batteries	5×1.2V AA NIMH batteries, continuous working for 6 hours	
Recharge Time	Approx. 2 hours	
AC Power Adapter	Input: 100V ~ 240VAC, 50/60Hz; Output: 12VDC /1.5A	
TestManagerPro	Operating System: WIN98/ME/2000/NT/XP	
Dimensions	L×W×H: 266mm × 90/144mm × 60mm	
Operating Temperature	0°C ~ 50°C	
Storage Temperature	-20°C ~ 70°C	
Humidity	5% ~ 95% non-condensing	
Weight	Approx. 800g	



ST-701 ADSL2+ Analyzer

ST-701 ADSL2+ Analyzer is an easy-to-use, hand-held advanced telecommunication tester that used for the installation, maintenance and measurement of ADSL2+ service. It supports the testing function such as parameter, error, DMM, PING/TRACE that related to ADSL2+ service, user register authentication and simulation MODEM on the ADSL2+ user's line side. It also directly enables the engineers to verify, troubleshoot and evaluate the ADSL2+ service. It is the right tool for the job.

With the ADSL line, you can use the tester to carry out the following measurements:

• Basic:

Line standard
Frame structure,
Line connection.

• Parameter:

Fast Bit Rates (FAST): Upstream and Downstream;
Interleaved Bit Rate (INTL): Upstream and Downstream;
Max Bit Rate: Upstream and Downstream;
Utilize Rate: Upstream and Downstream;
Transmit Power: Upstream and Downstream;
Line Attenuation: Upstream and Downstream;
SNR Margin (Signal to Noise Ratio) : Upstream and Downstream;

• Link: (Near and Far)

Loss of Power(LOP)
Loss of Signal(LOS)
Severe Error Frame (SEF)
Reed-Solomon Forward Error Corrections (FEC) INTL
Reed-Solomon Forward Error Corrections (FEC) FAST
Cyclic Redundancy Check (CRC) anomalies INTL
Cyclic Redundancy Check (CRC) anomalies FAST
No Cell Delineation (NCD) INTL
No Cell Delineation (NCD) FAST
Header Error Check (HEC) INTL
Header Error Check (HEC) FAST
Out of Cell Delineation (OCD) INTL
Out of Cell Delineation (OCD) FAST
Sever Error Second (SES)
Error Second (ES),
Bit Error(BE)

• Alarm:

Downstream Transmit Speed Threshold
Downstream SNR Margin Threshold
Downstream Channel Threshold
Downstream Line Attenuation Threshold
Upstream Line Attenuation Threshold

• DMT

SNR and Character bits allocation (graphic format) under 256/512 DMT

• PING testing

WAN PING testing: IP or domain ping testing, statistic Percentage of PING packet loss
LAN PING testing: IP PING testing, Find out the faultily connected PC and statistic Percentage of PING packet loss

• Simulate ADSL CPE MODEM completely

Substitutes ADSL MODEM, Supports Bridge, PPPoE, PPPoA, MER, IPoA regulation to perform ISP simulation login and verify operation performance of the terminal equipments. Real-time display rate and flux

• DMM

AC, DC voltage
Loop feeding current
Round resistance
Line capacitance
Line insulation capacitance
Estimate line distance

• Built-In Splitter

Test phone connection

ST-701 ADSL2+ Analyzer

Main Features

- Comply with multi-standards: ITU-T G.992.1 (G.DMT), ITU-T G.992.2 (G.Lite), ADSL2 (G.992.3) , ADSL2+(G.992.5)
- Automatically fit for the ADSL line standards, real-time display ADSL line connection status
- Support both WAN PING and LAN PING
- Support replacing MODEM and simulating the whole process of login on Internet
- High resolution backlight large LCD, Handheld design and easy-to-use
- Built-in Li rechargeable battery and smart charger circuit.
- High storages capacity, can store up to 70 groups of test results including settings and results information.
- Various Voice alarm and LED indications
- Upgradeable software via an integrated RS-232 interface
- Test results uploaded, conserved and printed by PC Manager Software

Specifications:

Item	Description
Line Connectors	RJ-11,RJ-45,DMM connector
Line Mode	DMT
Downstream Rate	24Mb/s
Upstream Rate	1.2Mb/s
Max Transmit Distance Supported	6.5km
Alarm and Status Indication	ALARM, LAN LINK/CTIVE, WAN LINK, WAN ACTIVE, CHARGE
Line standards Supported	ITU G.992.1 (G.DMT), ITU G.992.2 (G.lite), ITU G.992.3 (G.DMT.bis), ITU G.992.4 (G.lite.bis), ITU G.992.5 (ADSL2+), ITU G.992 Annex A, Annex B, Annex C (FBM and DBM) , Annex L (RE-ADSL), Annex M (Double UPstream), ANSI T1.413 Issue 2, YDN078-1998
Encapsulation Supported	PPP over ATM (PPPoA), PPP over Ethernet (PPPoE), Ethernet over ATM (EoA), IP over ATM (IPoA)
DMM Parameters	AC, DC Voltage (-110V ~ +110V) Loop resistance testing (0 ~ 100K Ω) Line Capacitance (0 ~ 200uF) Line insulation resistance (0 ~ 4M Ω)
Series Port	RS-232C
Rechargeable Batteries	Rechargeable Li 3600mAh battery, continuous working for over 3 hours
Recharge Time	Embedded smart charger circuit, recharge time less than 2.5 hours
AC Power Adapter	AC adapter, DC 12V/1.5A
PC Manager Software	WIN2000/ME/XP
Temperature	0°C ~ 50°C
Humidity	5% ~ 95% non-condensing
Dimensions	L x W x H 200mm x 160mm x 45mm



ST-2041 ADSL2+ Analyzer

ST-2041 ADSL2+ tester is a much compact and very easy-to-use handheld test instrument. It can support various ADSL line standards, specially for installation, maintenance and measurement. The operator all needs to do is to write the configuration, set the measurement margin and parameters, then, complete the functions of ADSL2+ line parameter, MODEM simulation, ISP login and so on by pressing one key. The tester will judge the result by itself that whether it complies with the standard according to the margin value embedded, and indicate it by LED and LCD directly. It can simplify the testing process and improve the efficiency greatly. Technicians will agree that ST-2041 is the right tool for the job.

Basic Function

- Automatically match with the ADSL line standards
- Support ADSL2+, ADSL2, RE-ADSL2 and downwards compatible with ADSL (G.DMT,G.Lite,T1.413) line standards:
- Line parameter measurement:
ADSL line standard display
Upstream and downstream Actual Bit Rate
Upstream and downstream Max Bit Rate
Upstream and downstream SNR Margin (Signal to Noise Ratio)
Upstream and downstream Line Attenuation
Upstream and downstream transmit Power
Result judge and indicate automatically
- MODEM simulation
Substitutes ADSL MODEM completely and validate the performance of MODEM
TX and RX data packet account
- PING testing
Write VPI, VCI, user name and password automatically according to configuration parameter embedded, ISP simulation login3 pre-set IP addresses embedded, start PING test automatically after login to validate the connectivity of WAN

More functions

- At least 100 sets test result reserve
- Indicate alarm, connectivity of WAN and LAN by LED
- Write configuration and margin value by TestManagerPro software via USB connector
- Further analysis, filed print, result output and software upgrade can be operated on PC via USB connector through TestManagePro software.

Main features

- Very light, smart in size and convenient to take with
- One-key operation, clearly result
- Red/green indicator displays the result directly
- High resolution backlight LCD display, analyze results one by one
- Match with various ADSL line standards
- Write configuration and margin value by software, insure the test account information safe

ST-2041 ADSL2+ Analyzer

Configuration:

Item	Qua	Item	Qua
ST-2041 ADSL2+ Tester	1	Water-proof bag	1
AC Power adapter	1	Quality Card, Maintenance card	1
ADSL test cable (RJ11)	1	Users Manual	1
ADSL Test cable	1	Packing list	1

Specifications:

Item	Description
Line Connectors	RJ-11,RJ-41, DC Power input connector, USB connector
Line Mode	DMT
Downstream Rate	24Mb/s
Upstream Rate	1.2Mb/s
Max Transmit Distance Supported	6.5km
Alarm and Status Indication	Alarm, LAN Link active, WAN link active, Battery charge indication
Line standards Supported	ITU-T G.992.1 (G.DMT), ITU-T G.992.2 (G.lite), ITU-T G.992.3 (G.DMT.bis), ITU-T G.992.4 (G.lite.bis), ITU-T G.992.5 (ADSL2+), ITU-T G.992 Annex A, Annex B, Annex C (FBM and DBM), ANSI T1.413 Issue 2, YDN078-1998
Encapsulation Supported	PPP over Ethernet (PPPoE), PPP over ATM(PPPoA)
Series Port	USB Connector
Recharge Batteries	Li batteries, continuous working for over 3 hours
Recharge Time	Embedded smart charger circuit, recharge time around 2 hours
Adapter	AC power adapter, DC12V/1.5A
TestManagerPro Software	WIN2000/ME/XP
Temperature	0°C ~50°C
Humidity	5%~95% non-condensing
Dimensions	200mm×95mm×40mm (L×W×H)
Weight	Approx 320g



ST-2048 New ADSL2+ Analyzer

ST-2048 ADSL2+ tester is a much compact, large color LCD and very easy-to-use handheld test instrument. It can support various ADSL line standards, specially for installation, maintenance and measurement. The operator all needs to do is to write the configuration, set the measurement margin and parameters, then, complete the functions of ADSL2+ line parameter, MODEM simulation, ISP login and so on by pressing one key. The tester will judge the result by itself that whether it complies with the standard according to the margin value embedded, and indicate it by LED and LCD directly. It can simplify the testing process and improve the efficiency greatly. Technicians will agree that ST-2041 is the right tool for the job.

Basic Function

- Automatically match with the ADSL line standards
- Support ADSL2+, ADSL2, RE-ADSL2 and downwards compatible with ADSL (G.DMT, G.Lite, T1.413) line standards:
- Line parameter measurement:
 - ADSL line standard display
 - Upstream and downstream Actual Bit Rate
 - Upstream and downstream Max Bit Rate
 - Upstream and downstream SNR Margin (Signal to Noise Ratio)
 - Upstream and downstream Line Attenuation
 - Upstream and downstream transmit Power
 - Result judge and indicate automatically
- MODEM simulation
 - Substitutes ADSL MODEM completely and validate the performance of MODEMTX and RX data packet account
- PING testing
 - Write VPI, VCI, user name and password automatically according to configuration parameter embedded, ISP simulation login
 - 3 pre-set IP addresses embedded, start PING test automatically after login to validate the connectivity of WAN

More functions

- At least 100 sets test result reserve
- Indicate alarm, connectivity of WAN and LAN by LED
- Write configuration and margin value by TestManagerPro software via USB connector
- Further analysis, filed print, result output and software upgrade can be operated on PC via USB connector through TestManagePro software

Main features

- Very light, smart in size and convenient to take with
- One-key operation, clearly result
- Red/green indicator displays the result directly
- High resolution backlight LCD display, analyze results one by one
- Match with various ADSL line standards
- Write configuration and margin value by software, insure the test account information safe



ST-280 xDSL Line Tester

ST-280 xDSL Tester, which is a handheld type of ADSL/ADSL2/ADSL2+ instrument for analyzing line test, can exercise rapid and accurate tests of physical layer of ADSL lines and network layer so as to be the necessary tool for provisioning and maintaining ADSL line

Specifications

No.	Configuration	Type: Portable
1	ADSL interface	One RJ11 interface
2	Ethernet interface	One RJ45 interface(10/100M)
3	Management platform interface	A PS/2 interface
4	User interface	Indicator, LCD screen and keys
5	LCD Screen	128*64 dot-matrix with backlight
6	Battery	Lithium battery, 7.4V/2500mAh
7	Power Adapter	100-240 V-50/60Hz input. 8.4V 1.0A output

Features

- Full support for all current Adsl standards: ANSI T1.413 Issur 2, ITU-T G.992(G.Lite), ITU-T G.992.3 (ADSL2), RE-ADSL and ITU-T G.992.5 (ADSL2+)
- Support various kinds of upper layer protocols, such as RFC 1483 (RFC2684), PPPoE(RFC2516), DHCP, PAP/CHAP.etc
- ADSL1/2/2+ physical layer transmission parameters test.
- Have function for indicating qualified or unqualified line and support user-defined parameters threshold
- Support various kinds of ULPs, including RFC 1483(RFC2684), PPPoE(RFC2516), DHCP, PAP/CHAP.etc
- Support PPPoE/DHCP IP address of dial-up access and Ping Tests
- Support system of fixed IP Ping test Can conduct LAN Ping Test
- Ping loss test(definable for number and packet size), Ping Circular delay (maximum, minimum, average) test
- Support ADSL2+ Modem replacement
- Free software upgrades

Operation Modes

- Simulation:: ATUR+PC Simulation ATUR+PC for physical layer testing ADSL, PPPoE dialup and IP Ping, DHCP and IP Ping dial-up system and fixed IP PING.
- Replace ADSL2+ Modem
- Ethernet Ping test as an IP terminal access to LAN for Ping Test
- DMM Test

No.	Name	Art.	Quantity	Remarks
1	Host	ST-280	1	
2	User Guide	ST-280SMM	1	
3	Alligator Clips Test Line	ALLIGATOR	1	
4	PS/2 serial Cable	PS/2	1	
5	Crossover Cable	RJ45-1.5	1	
6	Power Cable	PW8.4/1.0A	1	
7	Portable Instrument Package	ST-280	1	



ST-332B ADSL2+ Tester

ST-332B tester is multi-functional hand-held ADSL2+ test instrument with small size, specially designed for xDSL line test (xDSL include: ADSL, ADSL2, ADSL2+ READSL etc) and maintenance It provides xDSL test, PPPoE dial test, DMM test, Modem emulation, line voltage indication and so on.

The tester adopts LCD display and menu operation which can display the test results directly and improve the xDSL broadband service greatly. It's the best choice for the field operators of installation and maintenance.

Technical Specifications

ADSL2+	
Standards	ITU G.992.1 (G.dmt) , ITU G.992.2 (G.lite) , ITU G.994.1 (G.hs) , ANSI T1.413 Issue #2, ITU G.992.5 (ADSL2+) Annex L
Up channel rate	0~1.2Mbps
Down channel rate	0~24Mbps
Up/Down attenuation	0~63.5dB
Up/Down noise margin	0~32dB
Output power	0~31.5dBm
Error test	CRC, FEC, HEC, NCD, LOS
Display DSL connect mode	Available
Display channel bit map	Available
ADSL	
Standards	ITU G.992.1 (G.dmt) ITU G.992.2(G.lite) ITU G.994.1(G.hs) ANSI T1.413 Issue # 2
Up channel rate	0~1Mbps
Down channel rate	0~8Mbps
Up/Down attenuation	0~63.5dB
Up/Down noise margin	0~32dB
Output power	0~31.5dBm
Error test	CRC, FEC, HEC, NCD, LOS
Display DSL connect mode	Available
Display channel bit map	Available
DMM Test	
AC Voltage	0 to 400 V
DC Voltage	0 to 290 V
Capacitance	0 to 1000nF
Loop Resistance	0 to 20KΩ
Insulation Resistance	0 to 50MΩ
General Specification	
Power supply	Internal Rechargeable 2800mAh Li-ion battery
Battery Duration	4 to 5 hours
Working temperature	10-50 oC
Working moisture	5%-90%
Dimensions	180mm×93mm×48mm

Key Features

- 1) Test objects: ADSL2+; ADSL; ADSL2;READSL
- 2) Multifunction: Physical layer test; Modem emulation; PPPoE dial; DMM test; Browse IP address information; Determine telephone line faults (line break or mix)
- 3) Judge the quality of service
- 4) Data memory capacity: 50 records
- 5) LCD display
- 6) Menu operation
- 7) Simple, portable and money-saved

Main Functions

- 1) Physical layer test(Current and max rate, channel rate, attenuation, noise margin, output power, error test and so on)
- 2) Modem Emulation(Emulate the user Modem completely) PPPoE/PPPoA dial & Revise PPPoE/PPPoA dial properties, user name and password
- 3) DMM Test
- 4) Browse IP address information
- 5) Determine telephone line faults (break or mix)
- 6) Data memory capacity: 50 records
- 7) Bit/map display
- 8) Backlight function
- 9) Shut off automatically



ST-330 xDSL Tester

ST-330 is a designed portable test set for present all kinds of xDSL line including ADSL, ADSL2, ADSL2+, READSL. It not only can test xDSL physical layer parameter but also can help you to confirm whether your line is proper to provide xDSL service even to evaluate your line quality. It can have PPPoE/PPPoA dial, do IE network page browsing, and emulate user's PC+ Modem by inside Modem of ST-330 to test the connection between user and ISP provider. You can have all kinds of network test such as Ping, Ipconfig, Route, Tracert after successful dial. ST-330 also can emulate the user's PC to test broadband IP line or have PPPoE dial by user's Modem to test the connection of IP network and Modem problem or to remove the problem arisen by computer.

4. MODEM Emulation

Perform MODEM Emulation function to dial and log on internet to check faults.

5. File Management

Data record/deletion
Record browsing
File transfer among the tester, memory key and PC

Features

1. CE approval
2. Modular platform design
3. To identify and adapt the DSL line connect mode automatically
4. WINCE display and touching operation for user's easy operation
5. Remote software upgrade
6. Link to USB equipment, keyboard, mouse and memory key by USB port

Main Functions

1. xDSL Test
 - Physical layer test
 - Modem parameter set
 - PPPoE/PPPoA properties
 - PPPoE/PPPoA dial
 - Network layer test
 - Webpage browse
 - Loopback test
 - FTP client
 - Webpage speed test
2. LAN Test
 - Network card properties
 - PPPoE properties
 - PPPoE dial
 - Network layer test
 - Faxiative IP test
 - Webpage browse
 - FTP client
 - Webpage speed test
3. DMM Test
 - AC/DC voltage
 - Loop resistance
 - Capacitance
 - Insulation

Technical Specifications

Chip Set:	Globespanvirata
Relevant Standards:	ANSI T1.413 ITU-T G.992.1 (G.DMT) ITU-T G.992.2 (G.Lite) ITU-T G.992.3 (ADSL2) ITU-T G.992.5 (ADSL2+) ITU-T G.994.1 (G.HS)
Physical Layer Test	
ADSL2+ Module:	
Attenuation (dB):	0~63.5
Noise margin (dB):	0~32
Up channel speed (Mbps):	0~1.2
Down channel speed (Mbps):	0~24
The max test distance:	6.5 km
DMT sub channel bit number	0~15
State display	Signal loss, connection close.
DSL line up/down maximum rate and capacity ratio	
DSL line local output power	
DSL line error number (CRC,HEC, FEC,NCD,OCD)	
ADSL2 Module:	
Attenuation (dB):	0~63.5
Noise margin (dB):	0~32
Up channel speed (Mbps):	0~1
Down channel speed (Mbps):	0~8
DSL line error number (CRC,HEC,FEC,NCD,OCD)	
DSL line local output power	
DSL line connection mode	
DMM Test	
DC voltage (V):	0~400
AC voltage (V):	0~290





ST-2038 PCM Channel Analyzer

The ST-2038 is a world-class portable overall measuring instrument with many testing functions for PCM channel characteristics (both full-channel and half-channel), and error testing for E1 as well, based on multi-task OS of Win CE. It can be used to measure PCM device, digital switch, carrier wave communication device, client's dispatching equipment, digital broadcasting station with voice channel interface and VoIP device, especially applicable to science research, manufacturing, engineering installation, check and acceptance as well as maintenance.

1. Basic Functions

- Voice channel Characteristics testing

A-A: Level, Variation of gain with frequency, Variation of gain with input level, Total distortion including quantizing distortion, Idle channel noise, Crosstalk, Return loss, Longitudinal conversion loss, Longitudinal conversion transfer loss.

A-D, D-A, D-D: Level, Variation of gain with frequency, Variation of gain with input level, Total distortion including quantizing distortion, Idle channel noise, Crosstalk

- 2M (E1) frame and unframed BER testing, alarm detection and error analysis
- Call set-up: support on-hook, off-hook, dialing, ringing, and ringing supervise
- Auto and manual mode available, on the auto mode, all or one or several of the above performance characteristics can be selected to measure
- Support test of frequency spots sequence of equal step and customized frequency spots, and the number of spots is optional
- Support selective frequency measuring on all frequency spot
- Results are shown graphically, and can be compared with the built-in reference module to evaluate whether it passes or fails
- Perfect indication of working state and alarm
- Large storage capacity of results and measuring configurations, up to 100 groups
- Available in remote control via USB and Ethernet interface, to meet the need of different control modes
- Results can be uploaded to PC, so as to be analyzed, assembled, filed and printed via TestManager Pro software

2. Main Features

- Overall functions, satisfy users' measuring requirements
- Integrated with tone oscillator, Selective Frequency Meter, BER tester and Call Generation, more PCM channel characteristics can be measured one time
- 5.7 inches 640X480 high-resolution colorful LCD display
- Flexible control modes, supporting touch operation, key-stroke operation and expanded mouse operation
- Convenient Windows style, easy to operate
- Built-in call set-up circuit, can set up testing channel directly by dialing on the tester without the help of other telephone

ST-2038 PCM Channel Analyzer

2. Main Features

- Built-in generator and receiver, analog input and output interfaces are separately with ICT and OGT. Interfaces can be directly tested, including 2/4W E&M, MDR, LGE, FXO, LGS and FXS
- Built-in balanced bridge and reflecting bridge, Return loss, Longitudinal conversion loss and Longitudinal conversion transfer loss can be measured by one tester
- Built-in test mode can be defined by clients, efficiently satisfying testing standard definition of different products
- Remote control signaling group is available, so as to secondarily develop under different conditions by clients
- Embedded software can be upgraded online and protect the client's investment

3. Configurations

Item	QTY	Item	QTY
PCM Channel Analyzer	1	Stylus	1
AC Power Adapter	1	Portable bag	1
Special Testing Cable	1	Quality Certificate	1
USB communication Cable	1	User's Manual	1
TestManager Pro (CD)	1	Maintenance Card	1
		Packing List	1

4. Specifications

	Item		Description	
	Analog Loop	Generator	Sine wave signal output	Frequency Range Level Distortion Rate Variation of Frequency Response
			200Hzvi3600Hz, Step:1Hz +5dBm0vi-60dBm0, Step:0.1dB 1020Hz, 0dBm0, <-55dB ≤0.1dB	
Level			Range	200Hzvi3600Hz
			Level Range	+5dBm0vi-60dBm0
			Error Range	≤0.1dB
Variation of Gain with Frequency		Reference Frequency	1020Hz, -10dBm0	
		Measuring Range	+200Hzvi3600Hz	
		Error Range	≤0.1dB	
Variation of Gain with input Level		Reference Frequency	1020Hz, +5dBm0~-56dBm0	
		Measuring Range	+20dBvi-20dB	
		Error Range	≤0.1dB	
Receiver		Total	Reference Frequency	1020Hz, -56 dBm0vi+5 dBm0
		Distortion	Measuring Range	0vi-40dB, ITU-T Weighted
			Error Range	≤0.8dB
		Idle Channel Noise	Secondary Signal	420Hz, -45dBm0
			Measuring Range	+5vi-110 dBm0, ITU-T Weighted
			Error Range	≤0.5dB
		Crosstalk	Main-crosstalk Signal	1020dB, 0 dBm0
Measuring Range	+5vi-75 dBm0			
Error Range	≤1 dBm0			
Return Loss	Range	200Hzvi3600Hz		
	Level Range	+5dBm0vi-60dBm0		
	Error Range	≤0.2dB		

ST-2038 PCM Channel Analyzer

4. Specifications

		Item	Description	
Analog Loop	Receiver	Longitudinal Conversion Loss	Range	200Hzvi3600Hz
			Level Range	+5dBm0vi-60dBm0
			Error Range	≤0.2dB
		Longitudinal Conversion Transfer Loss	Range	200Hzvi3600Hz
			Level Range	+5dBm0vi-60dBm0
			Error Range	≤0.2dB
	Interface Type		FXO (LGE) , FXS (LGS) , 2/4WE&M (Balanced, unbalanced), MDR	
	Interface Impedance		600W, 200W+560W//0.1uF, 200W+680W//0.1uF Output 0 ₃ and Hi-Z input	
	Relative Level		Transmitted end: +1dBmvi-16dB, Step:0.1dBm Received end: +7dBmvi-10dB, Step:0.1dBm	
	DC Loop		ICT: Dynamic impedance>100K [^] Loop Current: max. 60mA Loop Voltage :approx. 18V; OGT: Dynamic impedance >100K [^] , DCHC :25mA	
Digital Loop	Sine wave signal output	Frequency Range	200Hzvi3600Hz, Step:1Hz	
		Level Range	+3dBm0vi-56dBm0, Step:0.1dB	
		Distortion Range	1020Hz, 0dBm0, <-46dB	
		Noise signal output	Transmitted Frequency	350Hzvi550Hz
			Transmitted Level	0dB m0
			Error Range	≤0.5dB
	Level	Frequency Range	200Hzvi3600Hz	
		Level Range	+3dBm0vi-60dBm0	
	Frequency Response	Measurement Range	1020Hz, -10dBm0 +200Hzvi3600Hz	
		Error Range	+3 dBm0 vi -40 dBm0	≤0.3dB
			-40 dBm0 vi -50 dBm0	≤0.6dB
	-50 dBm0 vi -55 dBm0		≤1.6dB	
	Variation of Gain with Input Level	Reference Frequency	1020Hz, 0dBm0	
		Measurement Range	+3dBm0vi-56dBm0	
		Error Range	+3 dBm0 vi -40 dBm0	≤0.3dB
	-40 dBm0 vi -50 dBm0		≤0.6dB	
	-50 dBm0 vi -55 dBm0		≤1.6dB	
	Total Distortion	Noise	Reference Frequency	350Hzvi550Hz
Level Range			350Hzvi550Hz	
Tone		Reference Frequency	200Hzvi3600Hz	
		Level Range	+3dBm0vi-60dBm0 ITU-T Weighted	
		Error Range	+3 dBm0 vi -40 dBm0	≤0.3dB
			-40 dBm0 vi -50 dBm0	≤0.6dB
-50 dBm0 vi -55 dBm0	≤1.6dB			

ST-2038 PCM Channel Analyzer

4. Specifications

		Item	Description	
Digital Loop	Receiver	Idle Channel Noise	Measuring Range	+0vi-110 dBm0, ITU-T Weighted
			Error Range	≤1dB
		Crosstalk	Main-crosstalk Signal	1020dB, 0 dBm0
			Measuring Range	+3vi-80 dBm0
			Error Range	≤1 dBm0
			Other	Interface Impedance
			Frame Type	PCM30/30CRC、PCM31/31CRC
			Coding Method	A-rule, L-rule
			Output Code	HDB3、AMI
E1 Error Testing			Interface Impedance	75 [^] 、120 [^]
			Frame Type	PCM30/30CRC、PCM31/31CRC、Non-frame
			Coding Method	A-rule, L-rule
			Output Code	HDB3、AMI
			Testing Pattern	2 ²⁰ -1、2 ¹⁵ -1、2 ¹¹ -1、2 ⁷ -1、1111、0000、1010、32bit programmable
			Transmitted Clock	Internal, interface
			Alarm Second	Signal loss, frame alignment, AIS, Multiframe alarm
			Signal Analysis	Line rate, Frequency Offset
			Basic Analysis (BIT、CODE、FAS)	Error, CER, EFS, AER
			G.821 Analysis	ES, DM, SES, Unavailability
			TestManager Pro	Support WIN98/NT/ME/2000/XP
			Power Supply	AC220V±10%, 50Hz
			Dimension	300mm*200mm*52mm (L*W*H)
			Working Temperature	0°Cvi50°C
			Storage Temperature	-20°Cvi70°C
			Humidity	5%vi95% non-condensing
			Weight	Approx. 1.8kg



ST-360 IPTV Tester

ST-360 is a professional IPTV Tester which designed for xDSL test and video frequency quality(Dithering, package loss, transmission speed, MDIDF delay), code stream quality (ISO TR101290 three ranks warning) and net configuration.ST-360 IPTV tester supports TS and ISMA which is the mainstream nowadays; various networks transmission seal way like UDP, TCP and so on; various sounds video frequency codes form like MPEG4 H264 AVS and so on; transmission quality analysis real-time curve demonstration; interception with the group broadcasts in the environment set top box emulation test; Simultaneously provides many kinds of tests pattern like the emulation, interception, series connection, straight connection etc.

This instrument uses 240×320 the true color TFT liquid crystal display with touching screen and embedded operating system, simple operation, economical, the test result is direct-viewing. It's primary assistant for opening and maintaining the IPTV service.

Key Features

- 1) Support DSL Line Test and IPTV Test
- 2) Support the full test of IPTV service, monitor the whole process from the STB initialization
- 3) Be compatible with many kinds of IPTV equipment, be compatible with many encapsulation formats (VLAN、PPPoE、RTP、RTSP、TCP、UDP、IGMP etc.)
- 4) Support TS and ISMA
- 5) Full test parameters, it can analyze the quality of the network transmission, and also can analyze the configuration of the network and the quality of codes stream (ISO TR 101 290 three ranks alarm)
- 6) Support MPEG2、MPEG4、H264、AVS、VC-1 etc
- 7) Can display the real time curve of transmission quality analyses
- 8) Support STB Emulation, interception, tandem connection, direct connection
- 9) Cooperated with IneoQuest, support full MDI DF parameters test
- 10) Support free upgrade
- 11) WINCE display interface, touching colorful screen,
- 12) Large capability of battery, equipped with power adapters and vehicular charger

Main Functions

1. DSL Test

- xDSL test
- Physical layer test
- PPPoE dial and PPPoE dial properties revise
- Network layer test (Ping, Ipconfig, Tracert and Route)
- Webpage browse function

ST-360 IPTV Tester

Main Functions

1. DSL Test

- LAN test
- LAN port PPPoE Dial and properties revise function
- Network layer test (Ping, Ipconfig, Tracert and Route)
- Fixative IP scanning function
- Webpage browsing function
- DMM test
- AC/DC Voltage
- Loop Resistance
- Capacitance
- Insulation
- Modem emulation

2. IPTV Test

IPTV test configuration

Mostly are settings of multicast addresses and several threshold values. Settings of multicast addresses should be in the multicast testing circumstance. Set top box (STB) emulation test in the multicast environment can be made after the success setting of testing items or multicast addresses.

IPTV initialization test

Test possible malfunctions during the process of IPTV initialization. Include:Line fault, Modem fault, STB fault, PPPoE dial fault, IPTV operation authentication and EPG obtain fault etc.

IPTV video stream detect

It can detect transmission video streaming automatically, display the video stream encapsulation format and net configuration parameter after the IPTV operation initialization.

IPTV test parameters

- Transmit quality and test parameter
- IP package number
- TS package number
- Video package number
- Audio package number
- IP package jitter
- IP package loss
- Transmission speed of IP package
- Video transmission speed
- Audio transmission speed
- PCR jitter
- Code stream quality
- Net configuration

Technical Specifications

Chip Set:	Globespanvirata
DSL Test	
Relevant Standards:	ITU-T G.992.5 (ADSL2+) ITU-T G.994.1 (G.HS) ITU-T G.992.5 Annex L ITU G.992.1 (G.DMT) ITU G.992.2 (G. lite) ITU G.994.1 (G.hs) ANSI T1.413 issue #2
Physical Layer Test	
ADSL2+ Module	
Attenuation (dB)	0~63.5
Noise margin (dB)	0~32
Up channel speed (Mbps)	0~1.2
Down channel speed (Mbps)	0~24
The max test distance	6.5 km
DMT sub channel bit number	0~15
State display	Signal loss, connection close
DSL line up/down maximum rate and capacity ratio	
DSL line local output power	
DSL line error number (CRC,HEC,FEC,NCD,OCD)	
ADSL2 Module	
Attenuation (dB)	0~63.5
Noise margin (dB)	0~32
Up channel speed (Mbps)	0~1
Down channel speed (Mbps)	0~8
DSL line error number (CRC,HEC,FEC,NCD,OCD)	
DSL line local output power	
DSL line connection mode	
DMM Test	
DC voltage (V)	0~400
AC voltage (V)	0~290
Loop resistance (Ω)	0~20K
Capacitance (nF)	0~1000
Insulation resistance (MΩ)	0~50
IPTV Test	
IP package number	Statistics of IP package gathered in the sampling period.
TS package number	Statistics of TS package gathered in the sampling period.
Video package number	Statistics of video package gathered in the sampling period.
Audio package number	Statistics of Audio package gathered in the sampling period.
IP package jitter	Reflect transmission quality of IP operation
	Layer.



ST-360 IPTV Tester

Technical Specifications

IP package loss	Reflect transmission package loss of IP operation layer.
Transmission speed of IP package	Refers to the speed of IPTV service package
Video transmission speed	
Audio transmission speed	
PCR jitter	Unique test index of TS transmission mode
Code Stream Quality	
Video format: video PID	
Audio format: audio PID	
Support various compressed format such as: MPEG2 MPEG4 H264 AVS	
PAT PID	
PMT PID	
Transport Stream synchronization loss exception alarm	
Synchronization byte error exception alarm	
PAT error exception alarm	
Continuously continues error exception alarm	
PMT error exception alarm	
Transmission error exception alarm	
CRC error exception alarm	
PCR error exception alarm	
PTS error exception alarm	
Net Configuration	
Transmission encapsulation	Support TS, ISMA
Format:	
Support free net encapsulation format	Include TCP, UDP, RTP, RTSP, Vlan, PPPoE etc
MDI DF	Delay in MDI test regulated by RFC4445
Source MAC	IPTV sender MAC
Dest MAC	STB MAC
Vlan priority	Vlan protocol information
Vlan id	Vlan protocol information
PPPoE version	PPPoE protocol information
PPPoE type	PPPoE protocol information
IP tos	IP protocol information
IP ttl	IP protocol information
Source IP	IPTV sender IP
Dest IP	STB IP
Source port	IPTV sender port
Dest port	STB port
Rtp type	RTP protocol information
Other Parameters	
Display	240×320 LCD, touch screen, Windows interface
External Connector port	RJ11 port, RJ45 port, USB port and charger port
Power Supply Internal	Rechargeable 2800mAH Li-ion battery
Battery Duration	8hs (except Modem status)
Dimensions/Weight	176mm×130mm×60mm/0.7kg (With battery)