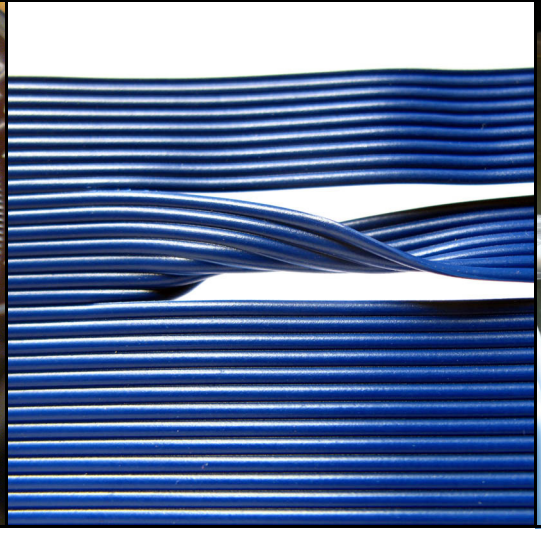
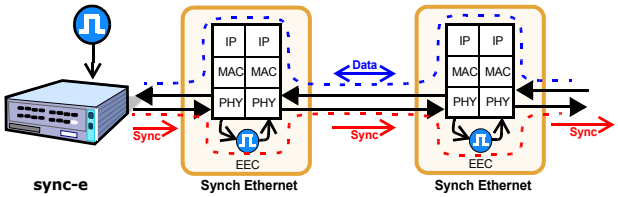




Ether.Genius 6-in-1 test

in Test we trust

ALBEDO Ether.Genius is a multitechnology tester equipped with all the features you need to install or maintain telecom networks based on Gigabit Ethernet (GbE), Synch Ethernet (SyncE), T1, E1, Datacom, PTP and Jitter/Wander.

Ether.Genius is suitable for legacy, present and future networks because it does support the most common transmission technologies GbE / T1 / E1 and the new generation based on SyncE / PTP. So our customers do not need to buy anymore several products or multiple modules to install and maintain transmission and synchronization networks.



The hardware is everyday cheaper, smaller and powerful. So, there is no need for external modules, everything fits on modern hand-held units. What we mean is that all the electronics including line interfaces can always be there and you pay only for those that you really need.

What is the point, then? Simple. No weak connectors to attach modules means perfect operation. Then you can concentrate just on your work (and you will never lost / forget / break another silly module).

Ethernet test

Ether.Genius is an Ethernet & IP tester equipped with all the features of normal testers, plus the new ones like Y.1564, Y.1731, and FCS error insertion, 8 x Multistream and MPLS to verify the QoS and SLA of new Multiplay services.

"Equipped with GbE, SyncE, PTP, Y.1564, T1, E1, Datacom, C37.94, Wander..."

Synchronization: SyncE & PTP

Ether.Genius is also a field tester for Synchronous Ethernet equipped with all the features to deploy and troubleshoot both SyncE infrastructures, and standard PTP protocols including Wander measurements and master/slave emulation.

World most comprehensive test

Be 100% sure of that. Why? because includes Dual Port, CAS ana/gen, G.703 codir, G.821, G.826, M.2100, DTE/DCE, Jitter/Wander, Pulse mask, VNC control, VF test, and many more features controlled with in a new generation CPU accurate and high resolution measurements.

ALBEDO Telecom

ETHERGENIUS

Multitechnology

All you need is test with ALBEDO Ether.Genius is an multitechnology tester equipped with all the features to install and troubleshoot telecom networks

Gigabit Ethernet

Users of Ether.Genius can relay on the instantaneous traffic generation set up and modify parameters such as headers, bandwidth and frame size directly.

Traffic Scan and Discovering

Ether.Genius can quickly scan the network traffic to select those flows to be tested and choose whether you want to monitor o execute any test.

m-Layer BERT

Layer 1, 2, and 3 BER testing is supported which can be configured to use either regular PRBS test patterns, stress patterns specifically for Gigabit Ethernet, or user test patterns to simulate traffic conditions.

Improved RFC 2544

Perform the RFC 2544 test option, testing throughput, frame loss, latency, jitter and burst is straightforward. Ether.Genius can execute it both in symmetric and asymmetric way and with the far-end device in loopback mode or peer-to-peer mode.

ITU-T Y.1564 e-SAM test

This new methodology for Ethernet executes multiple traffic streams completing the test in two phases:

- *Service Configuration,* confirms the end-to-end set-up while quickly checking the Information Rate (IR), Frame Delay Variation (FDV), Frame Loss Ratio (FLR), Frame Loss Ratio at the Service Acceptance Criteria (FLRSAC).
- *Service Performance,* transmits all configured traffic streams at the CIR confirming all traffic is able to transverse the network under full load while checking IR, FDV, FLR and availability.

Multistream

Ether.Genius permits up to 8 traffic streams that are configured with proper CoS and QoS priorization. The flows facilitate the simulation of realistic traffic conditions such as Internet, VoIP, IPTV.

Q-in-Q

Ether.Genius has the ability to test QoS by means of the VLAN CoS bits used for VLAN stacking by carriers and operators.

IP Services test

Often it is required to test IP features to verify end-to-end connectivity by means of Ping and Trace Route with ICMP echo request and analysis fully supported.

PTP Tests

The PTP protocol replaces NTP to enables accurate time services for application such as video, 3G, LTE and critical data.

All you need

Ether.Genius facilitate users to verify the connectivity, quality, and synchronization of networks controlled by means of PTP. Experts can now emulate 1588v2 slave/master clocks, and ensure network QoS by generating PTP messages and measure packet delay variation (PDV) stability over time which is a key parameter to maintain the quality.

T1, E1 and Datacom

Ether.Genius provides a scalable test solution for T1, E1 and datacom that includes full set of physical layer tests for T1, E1 balanced and unbalanced circuits including BERT, VF, signal level, round trip delay and one-way-delay with GPS. Upgradable software via an integrated USB interface is offered. Functions include:

- ITU-T G. 821, G. 826, and M. 2100,
- Collection of call records,
- CAS signalling generation / monitoring,
- Extensive error and alarm generation,
- VF tone generation and measurement,
- Frequency, slip and level test,
- Jitter measurement,
- Pulse mask representation.

Synchronous Ethernet

Ether.Genius tester can use several sources of timing, It can recover the clock from incoming data, it can use an external reference or it can use an internal clock to be used as master or in hold-over.

Jitter & Wander

Both measurements are executed in real time without the need of external devices. Jitter measurement are specific for T1/E1 while wander are for T1/ E1/SyncE/PTP.

SyncE G.826x

Complete Analysis and Generation of the signal and G.826x messages SSM to check the SyncE. ESMC and SSM protocols can be captured and decoded.

"6-in-1 instrument: no modules means NO PROBLEMS"

C37.94 test

Power electrical companies have to protect high voltage lines, the supervision requires to transmit information and the next generation of teleprotection schemes use of optical links at the physical layer following the IEEE C37.94 standard to exchange data between substations. Ether.Genius can be connected directly to this interface and execute Frame/Unframed BER, G.821 performance, Frequency deviation test (Hz, ppm, max), Round Trip Delay, One-Way delay with GPS, and Optical Power measurements.

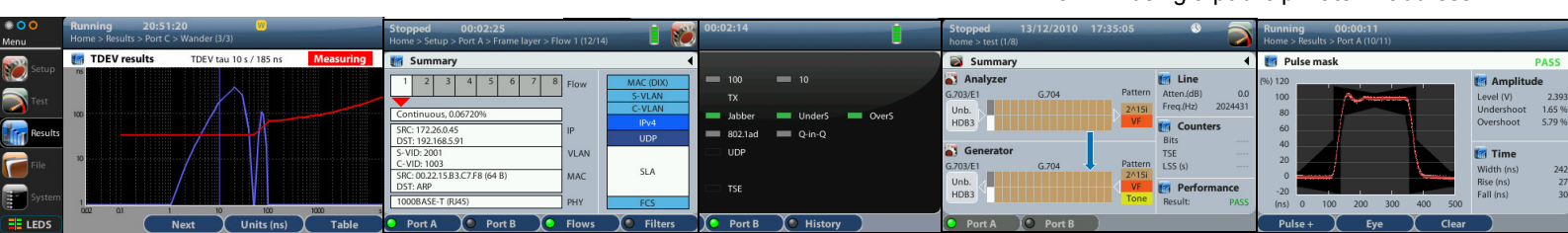
The value of innovation

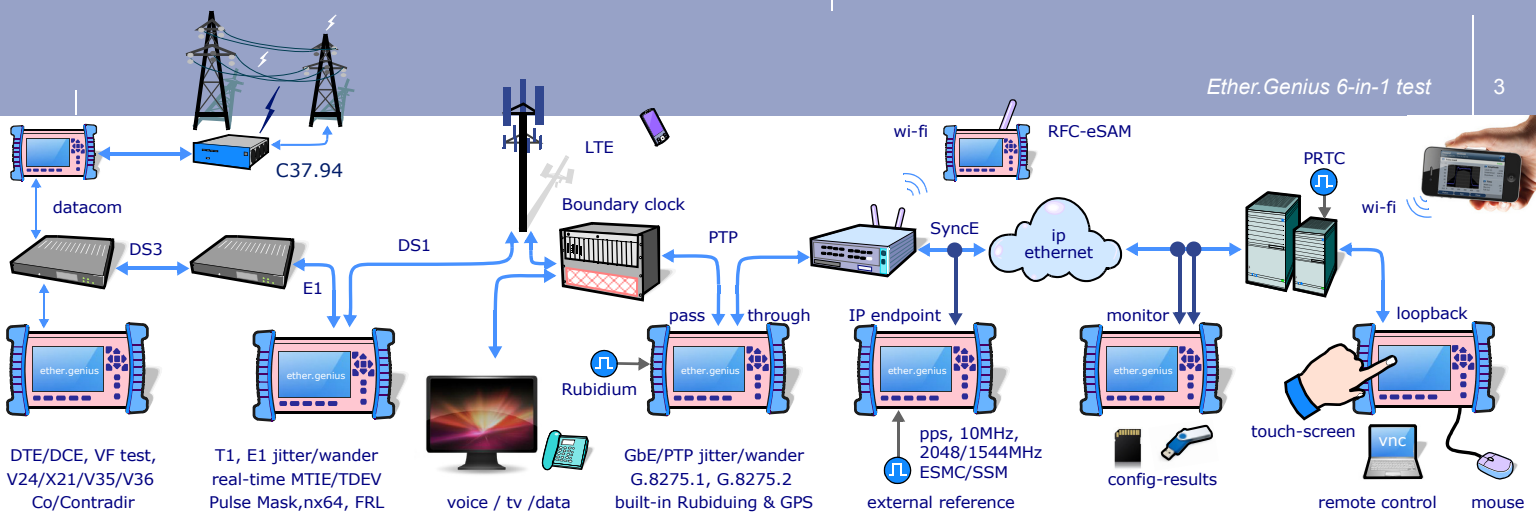
PASS / FAIL results

Engineers often have to repeat the same test several times, for them Ether.Genius provides the facilities to execute automatic tests that can be distributed by email, while the results are saved on disks.

Remote GUI: Wi-Fi and VNC

The Remote Control by means of VNC standards to grant full, but password controlled access, to configure, execute, and get results directly using an ad-hoc wi-fi or a LAN using a public/private IP address.





CISCO standard cables for data

Smart Operation

ALBEDO Ether.Genius is a field tool designed with rugged case and hardware that makes it a secure in harsh environments. It is controlled by a GUI very easy to navigate and learn. We have made a serious effort to make it suitable for any technical skill, and optimised for clarity.

Ethernet/IP maintenance

Carrier-Ethernet providers have to face the maintenance of unhappy customers that often do not differentiate between their internal issues and service provider problems. Now thanks to Ether.Genius is possible to measure at customer demarcation points that separate LAN/WAN, that is customers and operator networks. Test can be executed addressing both capacity and quality parameters simultaneously to prove where the issue is.

Synchronization

With Ether.Genius you get -in one go- ALL synchronization technologies: 1.5MHz, 2MHz, 10MHz, T1, E1, and pps time reference; SyncE and PTP with analysis/generation with jitter/wander measurements.

Performance Test

Commissioning Ethernet bandwidth is required before delivering the service to the customer that want to see how their SLA is satisfied.

Triple Play test on Mobiles

Using test suite -built on Ether.Genius- operators will be able to:

- Minimize Churn while gaining customer loyalty by quality service.
- Reduce Costs, as faulty networks require experts visiting customers.
- Increase Profits, offering innovative applications to raise the ARPU
- Grow the brand name, cultivating the perception of the company capable to deliver any type of m-play application.

In other words you will improve Service provision using advanced management solutions for quick and easy provisioning and maintenance.

T1/E1 testing market

This market has plenty of new opportunities including traditional applications such as voice, data, synchronization and leased lines, plus the new challenging architectures that combine T1, E1 circuit with Carrier-Ethernet and IP.

Voice and Data

T1, E1 systems are perfect for voice transfers. The T1, E1 connection has the capability to handle up to 32 voice conversations at once. The 2 Mbit/s circuit is widely used to connect millions of users attached to a PBX, base stations, satellite and microwaves links, with main exchange supporting voice and signalling of any standard including ISDN, POTS, VoIP and IMS.

BENEFITS

- All in one tester
- No modules = no problems
- 100% hardware included
- Upgradable by software
- Field tester extra rugged
- Up to 20h. on batteries
- Best price - Top featured

USERS

- Fixed / Mobile operators test
- GbE, T1, E1, PTP Installers
- Power Electrical Utilities
- Laboratories and field
- GSM, 3G, LTE roll-out
- Synchronization networks

KEY FEATURES

- Built-in Rubidium, OCXO, GPS/GLONASS clock
- PTP master/slave emulation
- Wander T1, E1, PTP, SyncE
- 1PPS mesurement
- One-way-delay
- ESMC / SSM full support
- Y.1564 (e-SAM) FTD, 2-way FDV, FDV, 2-way FTD, FLR SES, PEU and PEA
- Y.1731 QoS statistics
- Double Port (opt/elec)
- (A)Symm Y.1564, RFC-2544
- FCS error insertion
- Multistreams for IPTV, VoIP, Q-in-Q for demarcation tests
- MPLS support
- Scan MAC/IP/VLAN/Q-in-Q
- T1, E1, Jitter & Pulse mask
- VNC, LAN or Wi.Fi control
- C37.94 full test
- GUI by touchscreen, mouse

Ethernet Testing	
Interfaces	• Dual RJ-45 port for electrical connection 10/100/1000BASE-T; PoE detection and PoE transparency • 2 x SFPs ports: 10BASE-T, 100BASE-TX, 100BASE-FX, 1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX and 1000BASE-BX • Autonegotiation: Bit rate at 10, 100, and 1000 Mbit/s, Disable autonegotiation and direct set up • EtherType II (DIX v.2), IEEE 802.3, IEEE 802.1Q, IEEE 802.1ad; IEEE 802.2–LLC1, IEEE 802.3–SNAP; IPv4 (RFC791), IPv6 RFC2460)
Generation (8 streams)	• MAC address: Source / Destination, Default / User defined, Single / Range • VLAN: Single VLAN support, Q-in-Q stacking, VID, DEI, S-VLAN, C-VLAN, and Priority codepoint • Type / Length: Generation/Analysis, Jumbo frames with MTU up to 10 kB • Bandwidth Profile: Constant, in bit/s and frames/s, Periodic Burst, in high/low traffic, Ramp, in high/low traffic, Poisson • Loopback: L1to L4 layers, filtering conditions, broadcast and ICMP frames control • Single, burst, rate, random, FCS error insertion in pass-through mode • Unframed Layer 1 (IEEE 802.3-2008 Annex 36A): High, Low, Mixed Frequency Test, Long, Short (NCITS TR-25-1999): RPAT, JJTPAT, SPAT • Framed Layer 2-4 BERT; PRBS: 2e11-1, 2e15-1, 2e20-1, 2e23-1, 2e31-1 and inverted, All 1, all 0, ud. (32 bits), SLA Payload Y.1731 • RTD and VF tone generation
Filters for Statistics (up to 8 simultaneously)	• Ethernet Selection: MAC address, Type/Length, C-VID, S-VID, CoS and Priority with selection mask • IPv4 and IPv6 Selection: address, protocol, DSCP, Flow (v6): single value or range. UDP Selection: port: single value or range
Traffic Statistics	• Top 16 talkers: Sour/Dest MAC / IPv4 / IPv6 addresses, VID (VLAN), C-VID (Q_in_Q), S-VID (MPLS) • Ethernet Frame Counts (RFC 2819): VLAN, Q-in-Q, Priority, Control, Pause, BPDUs • Tx/Rx Uni-Multi-Broadcast, Errors, Undersized, Oversized, Fragments, Jabbers, Runts, (Late) Collisions, Sizes, MPLS stack length • Bandwidth Statistics: (in bit/s, frame/s, %) Rate, Max, Min, Aver, Occupancy, Unicast, Multicast, Broadcast • IPv4 & IPv6 counts: (in bit/s, frame/s, %) Unicast, Multicast, Broadcast, Errors, TCP, UDP, ICMP
Results	• Twisted Cable: MDI/MDI-X status, Open, Cable Length Test, Short, Polarities, Pair Skew. PoE: voltage and current • SFP: Presence current interface, Vendor, Part number, Optical power (over compatible SFP) • Frame Delay (FTD) Y.1563: Min/Max/Med/Mean; Delay Variation (FDV) RFC1889: Peak; Jitter Curr/Max/Min/Mean • Frame Loss (FLR) Y.1563, Duplicated: Out-of-Order packets (RFC 5236) • Availability: SES and Y.1563 PEU; BER: Count, seconds with errors, Pattern losses, pattern loss seconds
RFC-2544 & Y.1564	• RFC 2544: Throughput, Latency, Frame Loss, Back-to-back, Recovery • eSAM: test up to 8 non-color or 4 color aware services. Configuration: CIR, EIR, max. throughput for each service • Tests (CIR, EIR and policing) with FTD, FDV, FLR and availability • Performance test with FTD, FDV, FLR and availability results for all services
ICMP	• RFC 792: IP ping / Traceroute, Generation of ICMP echo request: Dest. IP address, Packet length, Generation interval • Analysis of ICMP echo reply: Round trip time, Lost packets, Time-To-Live Exceeded, Port unreachable

SyncE and PTP testing	
Clocks	• Built-in Rubidium and GPS, OCXO, internal (<2.0 ppm); external (10 MHz, 2048/1544 Mb/s, 2048/1544 MHz, 1 pps)
Synchronous Ethernet	• Interfaces: 100/1000BASE-T by RJ45; 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX and 1000BASE-BX by SFP both for all operation modes • Wander analysis / generation (MTIE / TDEV) Line Analysis: frequency (MHz), offset (ppm), drift (ppm/s); Offset (±125 / 0.001 ppm) • SyncE Generation / Decoding ESMC and SSM [ITU-T G.8264]
PTP / IEEE 1588(v2)	• Power & Telecom profiles, PTP Master/Slave emulation, PTP Decoding • Frequency test: FPC, FPR, FPP, Wander analysis/generation (TIE, MTIE and TDEV), Frequency offset (ppm) • Phase: Time Error (TE), max|TE|, constant/dynamic TE

T1, E1 & Datacom testing	
Interfaces	• Port A: Unbalanced (BNC) 75 Ω and balanced (RJ-45) 120 Ω; Balanced (Bantam) 100 Ω and balanced (RJ-48) 100 Ω • Port B: Balanced (RJ-45) 120 Ω Balanced (Bantam) 100 Ω (AT-1544 only) and balanced (RJ-48) 100 Ω • Port C: Unbalanced (BNC) 75 Ω Analogue voice frequency audio port • Additional balanced secondary T1, E1 port 0 to -6dB, nominal and PMP -20dB • Bit Rate: 1.544 / 2.048 Mbit/s ± 3ppm. Codes: HDB3 / AMI • 4 x SMA: Clock Source: Internal Timing: 1.544MHz, 2.048 MHz ± 25000 ppm; External Timing; Recovery from Rx Timing (Loop Timing)
BERT	• Unframed: FAS / FAS+CRC4. PCM30: FAS+CAS / FAS+CRC • Standard, non-standard PRBS, and user patterns. Transmit Error Rate • Force Single Error: Bit, Frame, CRC, and BPV (Bipolar Violation); Alarms, Errors Count; G.826, G.821, and M.2100
Datacom	• Smart Serial 26p DTE / DCE ports. DTE, DCE emulation and monitor • V.11/X.24, V.24/V.28, V.24/V.35, V.24/V.11 (V.36/RS449), EIA530 and EIA-530A. Codirectional according G.703 • Rate: 50, 60 bit/s, 1.2, 2.4, 4.8, 8, 9.6, 16, 19.2, 32, 48, 72, 128, 144, 192, 1544 kbit/ Nx56 kbit/s; Nx64 kbit/s, up to 10 Mbit/s
Jitter & Wander	• Overpass O.172: Jitter level, tolerance, transfer and Event detection. 100% digital based generation and analyzer • Wander Generation and Measurements (TIE, MTIE, TDEV). Wander results from 20 to 100 000s in tables, graphical plots and masks
Pulse Mask	• Pulse mask compliance: ANSI T1.102-1999, ITU-T G.703; PASS / FAIL function with Persistent Graphic Display scope • Nominal 2.37V for Coaxial Pair 75 Ohm, Nominal 3.00V for Symmetrical Pair 120 Ohm
C37.94	• Test Rate: N x 64 kbit/s; Frame/Unframed BER; ITU-T G.821: ES, SES, UAS, DM. Results with pass / fail indications • Frequency (Hz), Deviation (ppm), Max deviation; Round Trip Delay (ms), One-way Delay synchronized with GPS • Defects: LOC, AIS, LOF, RDI, LSS, All 0, All 1; Anomalies: FAS, TSE, Slip • Optical Power Meter

Platform	
Hand-held Instrument	• Touchscreen 480x272 TFT, Soft LEDS, 223x144x65mm, IP-54; 1 kg, Mouse, USB, Ethernet ports; SNMP, VNC support • Rechargeable Batteries continuous working up to 24 hs; Operating 0°C ~ 50° C Storage -20°C ~ 70°C; Humidity 5% ~ 95%

ALBEDO Telecom
in Test we trust