Ether10.Genius **Rubidium power**

**in Test we Trust**

ALBEDO Ether10.Genius is a multi-technology tester equipped with all the features you need to install and maintain telecom networks based on 10Gigabit Ethernet, Gigabit Ethernet, 1000/100/10BASE-T, SyncE, T1, E1, Datacom, PTP and C37.94.

The instrument is suitable for measuring legacy and next-gen networks because it has the most common access, backhaul and synchronization interfaces. Field engineers do not need to carry any more several testers or multiple modules to turn up and monitor telecom infrastructures.

**Cloud testing**

Ether10.Genius is equipped with all of the features you may need or imagine such including BER, RFC2544, eSAM, Multistream, MPLS, Jitter, Wander, etc. to permit the verification of the transmission layer in those terms of performance and quality required to support audio, video or critical data applications.

**Built-in Rubidium / GPS clock**

The integrated GPS/GLONASS receiver allows easy connection and use while fast acquisitions and excellent accuracy minimizing the time impairments of external devices. This an ideal solution to synchronize thanks to top performance in holdover mode while top accuracy in a real hand-held battery operated IP tester.

**Mobile telecom**

Operators have different synchronization requirements. Some of them running 3G may still maintain legacy E1 solely for synchronization. Those focused on LTE, see the impending need for distributing phase-synchronization and also want to avoid having to install GPS receivers at every single cell site. Alternatives are SyncE and PTP that simplify the architecture and can be turned-up with ALBEDO testers.

"Ideal tool to install LTE / Mobile backhaul by means of Master/Slave PTP emulation TE, Wander, PDV test at all interfaces from 10GbE to T1"

**Power Utilities**

Power utility companies must protect high voltage lines and monitor them constantly. Communication between power substations using the standard C37.94 is fundamental order to ensure correct operation while controlling every single alarm and failure. With Ether10.Genius a fully integrated test is possible.
10 Gigabit Ethernet

Users of Ether10.Genius can relay on the instantaneous traffic generation to set up and modify any IP/Ethernet header.

Traffic Scan and Discovering

The unit can quickly scan the network traffic to select those flows to be tested.

BER

Layer 1, 2, and 3 BER testing is supported and can be configured either with generic PRBS test patterns, specific patterns each Ethernet standard, either user test patterns to simulate traffic conditions.

Improved RFC

The RFC 2544 verifies the performance of the network testing throughput, frame loss, latency, jitter and burst, that can be executed as symmetric and asymmetric. The unit can also be setup in loop back mode or peer-to-peer mode.

Multistream

Ether10.Genius permits up to 8 traffic streams that are configured with proper CoS and QoS. The flows facilitate the simulation of realistic traffic conditions such as Internet, VoIP, IPTV.

e-SAM test

This Ethernet service activation test methodology for turning up, installing and troubleshooting Ethernet-based services allowing the complete validation of Ethernet service-level agreement (SLA) in a single test executed 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 (FRSAC).
- **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.

Q-in-Q

This tester 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.

LTE / 4G / 5G turn-up

LTE operators have to face with a number of technologies including 10GE and GbE at transmission layer, PTP and SyncE at synchronization plane, Datacom at routing layer, and eventually T1 or E1 to support legacy services.

Synchronization

LTE networks are demanding of accurate frequency and phase time references, particularly those architectures that consider small cells where the frequency reutilization is a key factor of performance. The tester can set up the synchronization network by means of a comprehensive set of features while accepting external clock ref., recovering clock from incoming data, or using the built-in Rubidium disciplined with GPS.

SyncE

Complete analysis and generation of the signal, SSM and SSM protocols can be captured and decoded.

PTP Tests

During the installation of PTP connectivity problems may occur between the master and slave units. When troubleshooting these links, the tester can be used in Terminate mode to capture PTP messaging on both the transmit and receive test ports up to 1 Gbit/s. In this mode the tester simultaneously generates, receives, and captures PTP messages on the circuit under test. Users can quickly identify higher layer protocol issues that may be associated with PTP messages and/or provisioning.

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 and PTP.

T1, E1 and Datacom

Ether10.Genius provides a scalable test solution for T1, E1 and datacom that includes full set of physical layer tests for balanced / unbalanced circuits including BERT, VF, signal level, round trip delay and one-way-delay with GPS.

C37.94 test

Field engineers can use this tester to turn up new C37.94 deployments, or to troubleshoot teleprotection relays and multiplexer by means features such as bit error rate testing (BERT), G.821, events analysis/generation, optical power meter one-way / round-trip delay, etc. to facilitate engineers to verify protection system that prevent outages in a power substations.

One-way delay

This test is very useful in several business including Telecom and Power utilities. One-way Delay saves hours of troubleshooting by detecting asymmetric traffic delays. Accuracies 10 times greater than most common SLA can be attained, network providers to differentiate their offering and allowing network planners to understand the delay tolerances affecting their applications.

Interestingly this model has an optional GPS/GLONASS receiver that improves the accuracy of the external receivers. It means that is ideal for one-way tests.
Testing the complexity

Double-port field unit

ALBEDO Ether10.Genius is a small field tool built in a rugged case that makes it a secure tool in harsh environments and only weighs 1kg. The unit is supplied with all the interfaces then any option can be activated with a simple code. For technicians responsible of the installation, commissioning and maintenance of communication infrastructures this test set provides valuable insight and simplifies complex issues by illustrating the full network picture. Experts will quickly characterize those network resources that are in a good shape and which ones require immediate intervention.

The value of innovation

Engineers often have to repeat the same test several times, for them this instrument provides the facilities to execute automatic script that can be distributed by email, while the results are saved on disks. The unit also support SNMP then it can store configuration, management and result information through a MIB that can be queried via SNMP agents or a Console.

Graphical User Interface

The GUI is easy to learn while the engineer may navigate using the touch-screen, keyboard or a mouse. It is also possible to control remotely by means of VNC to grant full access to the unit using the same layout, 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.

Packets, Circuits & Clocks

Everything is covered by Ether10.Genius a multitechnology tester to install and troubleshoot telecom services based on 10GbE, GbE, SyncE, PTP, Jitter, Wander, T1, E1, IEEE C37.94, Datacom, VF and one-way delay with GPS because it has been designed to deploy and troubleshoot brand new and legacy networks.

What else you need?

INTERNAL RUBIDUM

- Freerun (No GPS): Output freq. accuracy on shipment (24 h. warm up): ±5.0e-11
- GPS Locked: Time/Phase Accuracy to UTC: ±20 ns at 1σ after 24 h lock
- Hold-over accuracy (after 24h locked) frequency 1.5e-11/24h time: ±100ns/2h ±1.0 μs/24h

BENEFITS

- Quality hold-over
- All-in-one solution
- No modules = no problems
- 100% hardware included
- Field tester extra rugged
- Up to 22h. on batteries
- GUI by touchscreen, mouse
- Best price - Top featured
Ethernet Testing

**Interfaces**
- **SFP / SFP+**: 10GBASE-SR, 10GBASE-LR, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBASE-ER, 10GBAS