professional TELECOM&POWER solutions

Corporate Presentation – Mar 2022

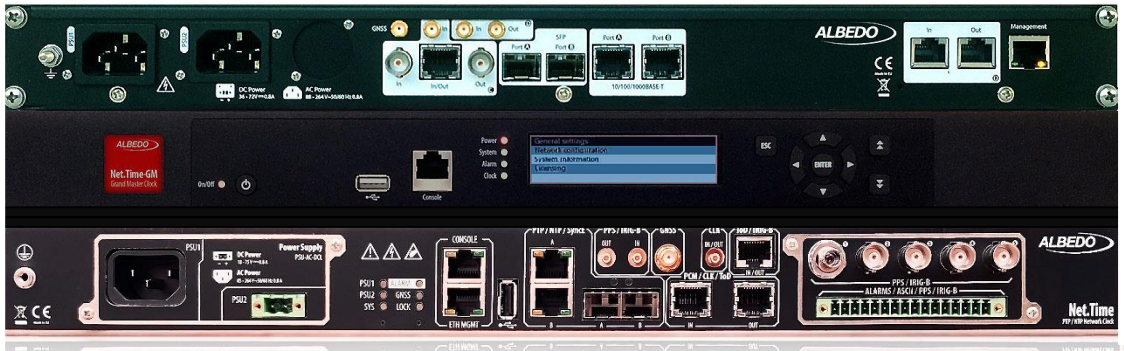
ALBEDO Telecom

the Path to Excellence

ALBEDO: a **global** player of **telecom** appliances

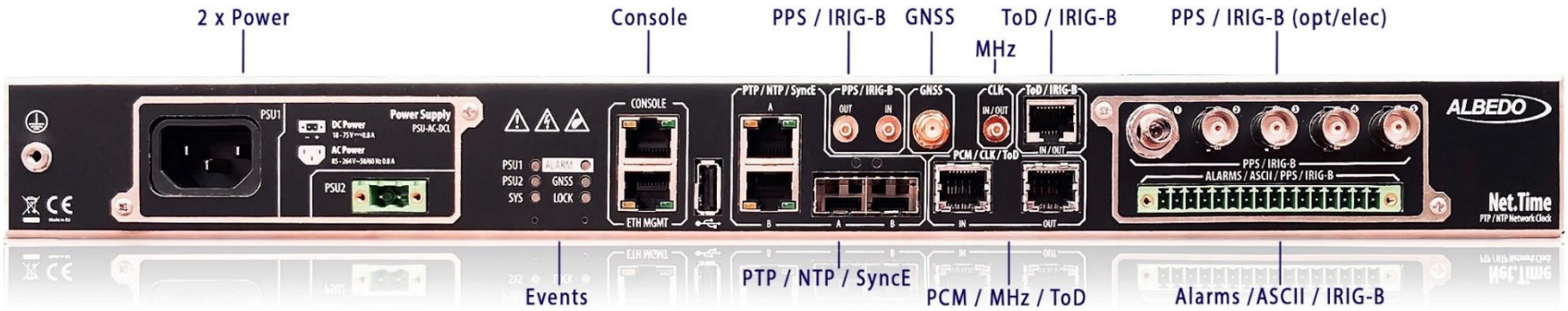
ICT electronics (1983)

Trend Comms (2001)



ALBEDO (2009 - today)

Net.Time Φ a Power Utility clock



Net.Time simplifies the transition to PTP providing seamless translation between all the protocols installed in the Substations including NTP, PTP, SyncE, ToD or IRIG-B to PTP and viceversa. Equipped with a Rubidium or OCXO oscillator, Net.Time supports the widest variety of time references and distribution signals in order to simplify the synchronization of new and legacy appliances.

- NTP / PTP telecom profile
- PRP native (DAN-P clock)
- OCXO / Rubidium oscillators
- GNSS, SyncE, ToD, PPS, ToD, T1/E1, BITS, MHz, Mb/s
- Configurable as Master, Boundary or Slave
- Applications: Power Substations, Railways

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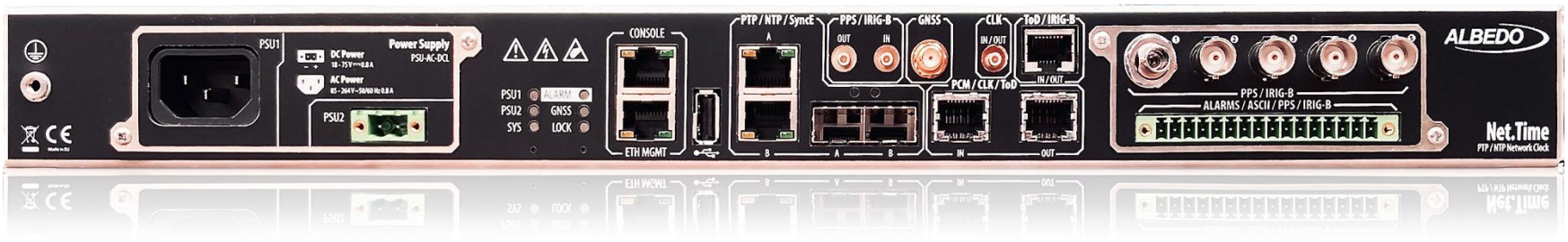
Net.Time Ω an Industrial clock



Net.Time Omega is a general purpose PTP / NTP clock designed to supply synchronization to clients connected to Ethernet / IP networks. It also facilitates the interconnection between different PTP networks as it supports Telecom and Power profiles. Once locked to the reference it delivers highly accurate synchronization to all the clients connected by optical or electrical links. All of them will receive a selection of timing signals.

- NTP / PTP telecom and power profiles
- PRP native (DAN-P clock)
- OCXO / Rubidium oscillators
- GNSS, SyncE, ToD, PPS, ToD, T1/E1, BITS, MHz, Mb/s
- Configurable as Master, Boundary or Slave
- Five different modules to satisfy any configuration
- Applications: Finance, Air Traffic control, Military

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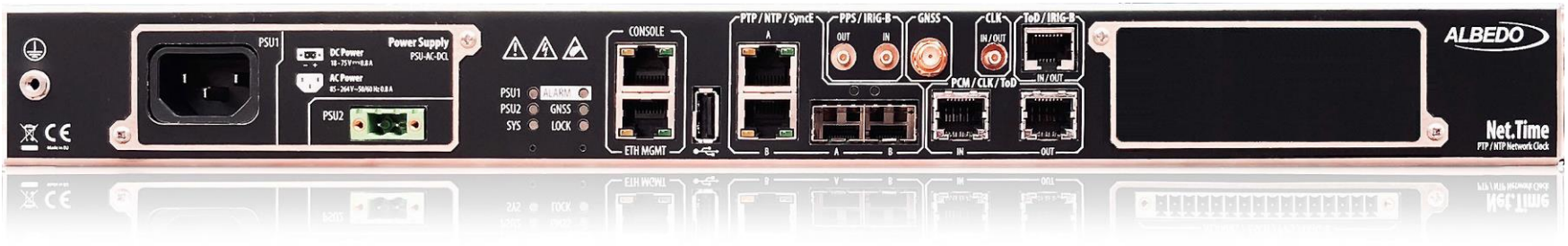
Net.Time τ a Telecom clock



Net.Time Tau is a boundary clock ideal to assure the delivery of quality time, phase and frequency across a network of base stations or micro cells. It accepts a wide variety of time refs and offers the widest range of timing signals to facilitate the integration of networks.

- 1 Gb/s Ethernet
- NTP / PTP telecom profile
- OCXO / Rubidium oscillators
- GNSS, SyncE, ToD, PPS, ToD, T1/E1, BITS, MHz, Mb/s
- Configurable as Master, Boundary or Slave
- Applications: 5G timing, Ethernet/IP back-haul

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xGenius: **Transmission** & **Synchronization**

ALBEDO xGenius is a multi-technology tester equipped with 8’ screen and all the features you need to install and maintain telecom networks based on 10Gigabit Ethernet, Gigabit Ethernet, 1000/100/10BASE-T, SyncE, T1, E1 and PTP.

- Built-in Rubidium, OCXO, GNSS receiver
- PTP master/slave emulation, NTP server emulation
- Wander T1, E1, PTP, SyncE
- 1PPS measurement
- TE max |TE|, Constant and dynamic TE components
- Y.1564 (e-SAM) FTD, 2-way FDV, FDV, 2-way FTD, FLR SES, PEU and PEA
- Captures any Ethernet protocol and save it in PCAP

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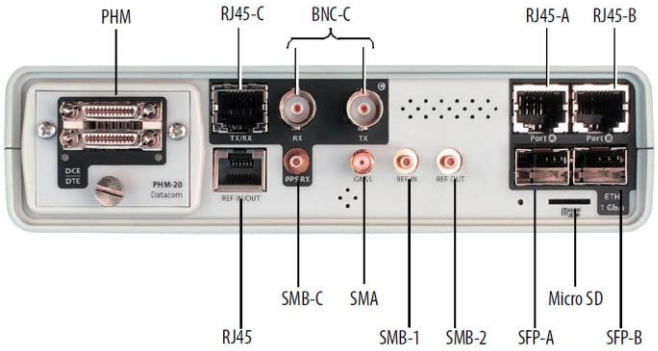
Zeus: first Handy IEC-61850 tester



Zeus provides deep insights to design, install, maintain and engineer the Smart Grid and more particularly Power Substations. The unit is able to test Ethernet/IP, PTP, NTP, GbE, IRIG-B, T1/E1, G703, C37.94, GOOSE, SV and MMS protocols. One-way-delay tests, assisted by GPS, is possible at all interfaces, and it has a set of programmable filters to capture live data traffic at wire-speed.

- IEC 61850 migration
- Teleprotection
- Serial Communications
- PTP Clock emulation
- IRIG-B support
- GOOSE, MMS, SV capture and analysis
- One-way delay in all interfaces

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Ether.**Genius**: 6-in-1 tester @ 1Gb/s

Field tester to verify Ethernet/IP up to 1Gb/s supporting Sync-E/PTP protocols with multiple optical/electrical interfaces for GbE/PDH/T1/E1/E0/C37.94 and Datacom as well. Operation modes include Performance and Quality tests at all interfaces and the ability to emulate PTP/SyncE, while featuring well on Frequency/Phase and PDV metrics. It is indeed the smallest test set with a built-in Rubidium clock GPS disciplined.Ports: 2T1/E1 +2GBE+DTE/DCE

- SyncE MTIE/TDEV measurement
- Wander analysis / generation
- PTP master / slave, support decoding
- T1/E1 test Jitter/Wander, Pulse
- One-way delay test (GPS accuracy)
- Datacom with Standard cables
- DTE+DCE for all operation modes

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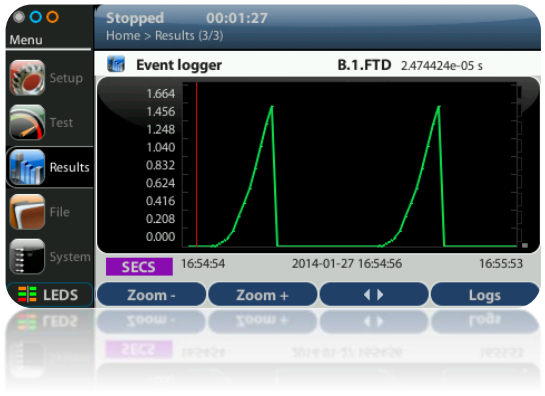
Ether.Giga



Dual port tester equipped with all standard features to quickly install, validate or troubleshoot Ethernet and IP while verifying the Quality of the new applications.

- 2xSFP + 2xRJ45 ports
- Y.1564 (e-SAM) FTD, 2-way FDV, FDV, FTD, FLR, SES, PEU and PEA
- Sym/Asymmetrical RFC2544 test
- FCS error insertion
- PoE detection / transparency
- Multistreams for IPTV, VoIP, Data
- Q-in-Q for demarcation tests
- Full MPLS support
- Scan MAC/IP/VLAN/QinQ

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AT.**2048** & AT.**One**

The AT-2048 is an excellent tester for network operators, contractors and enterprise users that have to manage fixed and mobile networks that are using E1 and Datacom backhaul circuits

- Non-stop tester 24h on batteries
- 2 x port BNC and 2 x port RJ45
- Extra rugged but lightweight
- Monitor and Pass Through modes
- Jitter / Wander tests (with all masks)
- Pulse Mask
- Cisco Data Cables
- 2xUSB & RJ45Ports
- VNC remote control

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Net.**Shark** & Net.**Hunter** – hand-held taps

Both capture, forward & save packets in real time without generating jitter, delays or loss. Net.Hunter is a stream-to-disk device that can capture packets without disturbing live traffic

- Wirespeed operation nsec accuracy
- Non-stop packet tap 24/7/365
- Filter/Capture/Tap at full duplex GbE
- Storage size: 512 GB disk
- NTP Synchronised
- Wireshark friendly
- No MAC or IP: Undetectable
- Monitor and Pass Through modes
- Captures CRC errored frames
- 16+16 Programmable Filters

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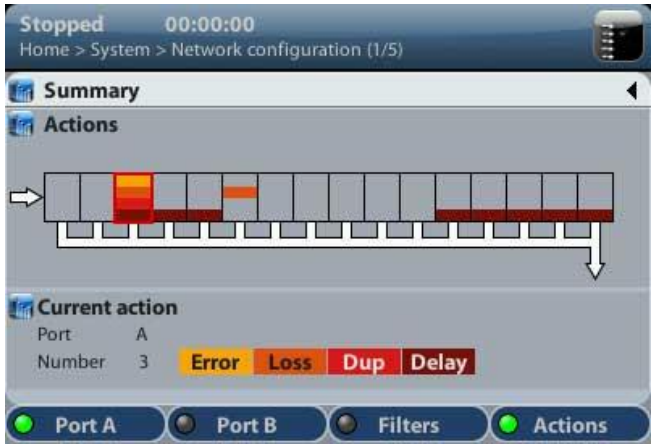
Net.Storm: **compact** WAN emulator



Generates those perturbances typical of Metro Ethernet / IP networks:

- Impairments
  - Packet Delay / Packer Jitter
  - Packet Loss
  - Frame Duplication
  - Errored Frames
- Switch Simulation
  - Bandwidth Policing
  - Bandwidth Shaping
- 16+16 Programmable Filters
  - MAC / IPv4 / TCP / UDP Selection
- Wirespeed operation nsec accuracy

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VoIP.Master for **VoIP service** turn-up

This is an advanced turn-up and maintenance solution to test and deploy VoIP trunks and hosted services, VoIP servers, VoIP PBX.

- PBX and Network Trunk SIP Emulation
- PBX and ITSP Mass Call Mode
- T.38 Fax and Gateway Emulation
- MOS indication
- Detailed RTP statistics
- Test Pass/Fail thresholds
- PDF Call Log and Test Statistics
- Emulate VoIP infrastructure

GPON Doctor **4k5 / 9k5**

GPON Doctor 4500 model is a comprehensive tool for xGPON deployments while the 9500 model is for indicated for GPON/XGS-PON deployments.

- Portable, passive, chipset-less
- Protocol sniffer and analyzer
- Captures downstream and upstream
- Bit-level information
- Comprehensive analysis
- GPON and XGS-PON TC
- Supports OAM, PLOAM and OMCI
- Non-invasive Capture
- Smart Network analysis
- Real time Ethernet traffic extraction

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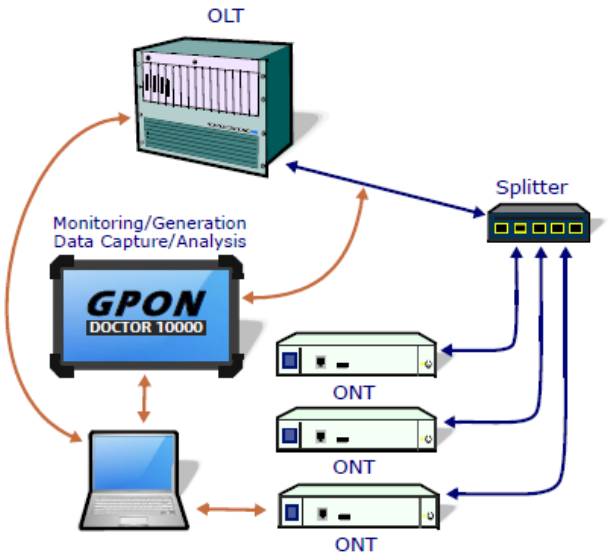
GPON Doctor **10k**



GPONDoctor 10000 is a chipset-less passive portable dual analyzer of FTTH XGS-GPON and GPON protocols. Once connected to a point in the distribution fiber it captures data at the downstream and upstream bit-level, interpreting the information at PLOAM and OMCI levels, allowing regeneration of Video or VoIP services.

- Capture + Analyze + Evaluate
- Service regeneration and QoS evaluation
- Protocol sniffer and analyzer
- Captures downstream and upstream
- Bit-level information
- Comprehensive analysis
- Capture XGS-GPON / GPON in real time
- Non-invasive Capture
- Optical Power and Error Detection
- Real time Ethernet traffic extraction

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That's all

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