



Telecom **backhails** have migrated to 10Gb Ethernet/IP/MPLS while bunch of synchronization alternatives are available including: a) **TDM** based signals such as E1/T1, b) satellite **GNSS** and c) packet based solutions such as **SyncE** and **PTP**. **Ether10.Genius** is ready to test or monitor these architectures while emulating terminals, multiplexers, clocks and trasmission nodes.

Market Analysis

Updated on 23/3/18

Testing from 1 to 10G/s

Ether.Genius Ether10.Genius	VePAL TX320	MTS-5800	NetBlazer V2	Network Master Pro MT1000A
				
ALBEDO	VEEX	VIAVI	EXFO	ANRITSU

CONFIDENTIAL

PLATFORM					
Size	• 210 × 110 × 60 mm • Volume: 1,386 cc • 1.1 kg	• 290 × 140 × 66 mm • Volume: 2,680 cc • 1.58 kg	• 215 × 175 × 42 mm • Volume: 1,580 cc • 1.9kg	• 254 × 210 × 55 mm • Volume: 2,934 cc • 2 kg	• 257 × 164 × 77 mm • Volume: 3,245 cc • 2.7 kg
Architecture	• All interfaces included	• Factory Moduls	• All interfaces included	• Modular equipment	• All interfaces included
Display	• 480 x 272 pixels (4.3") • Touchscreen • Keyboard • Mouse	• 840 x 480 pixels (7") • Touchscreen • Keyboard	• 1200 x 600 pixels (7") • Touchscreen	• 8 inch • Touchscreen • Multitouch	• 800 × 480 pixels (9") • Touchscreen
Ruggedness	• 1,5 meters drop	• 1,0 meter drop	• IEC 721	• (?)	• (?)
Remote Control	• Standard VNC • SNMP	• Proprietary (ReVeals)	• Standard VNC • SNMP	• Standard VNC	• Standard VNC
Batteries	• 2 x Li-Po • 8 hours in 10 GbE • 24 hours in EI	• Li-Ion • 2-6 hours	• Li-Ion • 4 hours in 10GbE	• Li-Ion • 2 hours	• Li-Ion • 4 hours
Auxiliar Ports	• Ethernet RJ45 • 2 x USB • Headset 3.5 mm • SD card	• Ethernet RJ45 • 2 x USB • Bluetooth • Celullar	• 2 x Ethernet RJ45 • 2 x USB • Bluetooth • Celullar	• Ethernet RJ45 • 3 x USB • SD card	• 3 x USB • Ethernet RJ45 • IEEE 802.11 b/g/n • Bluetooth • Headset
GNSS receiver	• Antenna	• Antenna	• Antenna	• No	• Antenna
Optical Interfaces	• 2 x SFP+ • C37.94	• 2 x SFP+	• 2 x SFP+	• 2 x SFP+	• 2 x SFP+
Electrical Interfaces	• 2 x RJ-45 • 2 x BNC • 2 x RJ45-balun • External Clock input • VF input • 2 x Datacom DTE/DCE	• 2 x Bantam / RJ45 • 2 x BNC • External Clock input • VF input	• 2 x Bantam • 2 x RJ-45 • 2 x BNC • External Clock input • VF input	• 1 x Bantam • 2 x RJ-45 • 2 x BNC • External Clock input • VF input	• 4 x Bantam • 2 x RJ45 • 2 x RJ48 • 4 x BNC • BNC External Clock input • VF input

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CLOCKS					
Internal Clock	<ul style="list-style-type: none"> - Rubidium built-in - GPS built-in receiver - OCXO ±0.1 ppm - Default better ±2.0 ppm 	<ul style="list-style-type: none"> - CSAC built in - GPS built-in receiver - Internat Atomic clock 	<ul style="list-style-type: none"> - Rubidium external - Internal (Stratum 3) 	<ul style="list-style-type: none"> - (?) 	<ul style="list-style-type: none"> - 4.6 ppm,
External Inputs	<ul style="list-style-type: none"> - DSI, EI - 1.5, 2, 10 MHz - 1 pps 	<ul style="list-style-type: none"> - DSI, EI - 1.5, 2, 10 MHz - 1 pps - SyncE, PPT 	<ul style="list-style-type: none"> - DSI, EI - 1.5, 2, 10 MHz - 1 pps 	<ul style="list-style-type: none"> - 1.5, 2 Mb/s, - 1.5, 2 MHz 	<ul style="list-style-type: none"> - DSI, EI - 2, 10 MHz - 1 pps - PTP
Clock outputs	<ul style="list-style-type: none"> - 1 pps - 2Mb/s, - 2.0, 10 MHz 	<ul style="list-style-type: none"> - 1.5, 2.048 Mb/s - 1.5, 2, 10, 25, 125 MHz - 1 pps 	<ul style="list-style-type: none"> - No(?) 	<ul style="list-style-type: none"> - 1.5, 2 Mb/s, - 1.5, 2 MHz 	<ul style="list-style-type: none"> - (?)

SYNCHRONOUS ETHERNET - ITU-T G.8261					
PTP Modes	<ul style="list-style-type: none"> - Master, Slave, Passthrough 	<ul style="list-style-type: none"> - Master, Slave 	<ul style="list-style-type: none"> - Master, Slave 	<ul style="list-style-type: none"> - Master, Slave 	<ul style="list-style-type: none"> - Master, Slave
Frequency	<ul style="list-style-type: none"> - Offset and Drift - Analysis and Generation 	<ul style="list-style-type: none"> - Offset - Analysis and Generation 	<ul style="list-style-type: none"> - Offset - Analysis and Generation 	<ul style="list-style-type: none"> - Offset - Analysis 	<ul style="list-style-type: none"> - Offset - Analysis
ESMC / SSM (QL)	<ul style="list-style-type: none"> - Monitor, decode, generat. 	<ul style="list-style-type: none"> - Monitor, decode, generat. 	<ul style="list-style-type: none"> - Monitor, decode, generat. 	<ul style="list-style-type: none"> - Monitor, decode, generat. 	<ul style="list-style-type: none"> - Monitor, decode
SyncE Wander	<ul style="list-style-type: none"> - Built-in and real-time measurement - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - Built-in and real-time measurement - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No
Wander Generation	<ul style="list-style-type: none"> - SyncE Sinusoidal wander 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No

PTP - 1588v2					
PTP modes	<ul style="list-style-type: none"> - Master, Slave, Transparnt - Protocol Decode/Generate - Freq. offset, drift 	<ul style="list-style-type: none"> - Master, Slave, Transparnt - Protocol Decode/Generate - Freq. offset, drift 	<ul style="list-style-type: none"> - Requires external device!! - Master, Slave - Protocol Decode/Generate 	<ul style="list-style-type: none"> - Master, Slave - Protocol Decode/Generate 	<ul style="list-style-type: none"> - Master, Slave - Protocol Decode/Generate
PTP 1-step GM	<ul style="list-style-type: none"> - 1-step GM emulation 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - 1-step GM emulation 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No
PTP 2-step GM	<ul style="list-style-type: none"> - 2-step GM emulation 	<ul style="list-style-type: none"> - 2-step GM emulation 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No
PTP PDV statistics	<ul style="list-style-type: none"> - Yes 	<ul style="list-style-type: none"> - Yes 	<ul style="list-style-type: none"> - Yes 	<ul style="list-style-type: none"> - (?) 	<ul style="list-style-type: none"> - (?)
PTP Phase analysis	<ul style="list-style-type: none"> - Time Error (TE) - Dynamic TE - Constant TE 	<ul style="list-style-type: none"> - Time Error (TE) 	<ul style="list-style-type: none"> - NoTime Error (TE) - Dynamic TE - Constant TE 	<ul style="list-style-type: none"> - (?) 	<ul style="list-style-type: none"> - (?)
PTP Profiles	<ul style="list-style-type: none"> - Telecom - Electrical 	<ul style="list-style-type: none"> - Telecom 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No(?) 	<ul style="list-style-type: none"> - No(?)
PTP Wander	<ul style="list-style-type: none"> - Built-in and real-time - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - Built-in and real-time - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - No in realtime - Requieres a tool-kit 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No
Floor metrics	<ul style="list-style-type: none"> - FPR, FPP, FPC - Pass / Fail threshold 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No

1 pps					
1pps Wander	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - (?)
Time Error (TE)	<ul style="list-style-type: none"> - TE, max TE 	<ul style="list-style-type: none"> - TE, max TE 	<ul style="list-style-type: none"> - TE, max TE 	<ul style="list-style-type: none"> - TE, max TE 	<ul style="list-style-type: none"> -

1544 MHz, 2048 MHz, 10 MHz					
MHz Wander	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - TIE, MTIE, TDEV 	<ul style="list-style-type: none"> - No 	<ul style="list-style-type: none"> - No

	Ether.Genius Ether10.Genius	VePAL TX320	MTS-5800	NetBlazer V2	Network Master Pro MT1000A
MHz Jitter	· YES	· No	· No	· No	· No

ETHERNET - IP					
Test Ports	· 10G WAN, 1000BASE-X, 10/100/1000BASE-T, 100BASE-FX · Dual Port	· 10G WAN, 1000BASE-X, 10/100/1000BASE-T, 100BASE-FX · Dual Port	· 10G WAN, 1000BASE-X, 10/100/1000BASE-T, 100BASE-FX · Dual Port	· 10G WAN, 1000BASE-X, 10/100/1000BASE-T, 100BASE-FX · Dual Port	· 10G WAN, 1000BASE-X, 10/100/1000BASE-T, 100BASE-FX · Dual Port
Frames	· IEEE 802.3 / DIX · VLAN, 802.1ad / Q-in-Q · MPLS · FCS error insertion · IPv4 and IPv6	· IEEE 802.3 / DIX · VLAN, 802.1ad / Q-in-Q · MPLS · IPv4 and IPv6	· IEEE 802.3 / DIX · VLAN, 802.1ad / Q-in-Q · MPLS · IPv4 and IPv6	· IEEE 802.3 / DIX · VLAN, 802.1ad / Q-in-Q · MPLS · IPv4 and IPv6	· IEEE 802.3 / DIX · VLAN, 802.1ad / Q-in-Q · MPLS · IPv4 and IPv6
Optical	· Power Meter	· Power Meter · OTDR	· Power Meter	· Power Meter	· No
PoE Plus	· Yes PoE Plus	· No(?)	· No(?)	· Only standard PoE	· Only standard PoE
Cable test	· TDR: Open, Short distance to fault · Active links: MDI / MDIX · Wiremap: Open, Short, Straight, Crossed, Polarity, Pair skew, Crosstalk	· TDR: Open/Short distance fault	· TDR: Distance to fault · Wiremap: Polarity, Skew	· TDR: Open, Short distance to fault · Cable length · Wiremap: Open, Short, Straight, Crossed, Polarity, Pair skew	· No
Operation Modes	· Terminal: IP, Ethernet, LI · Pass through, Monitor · Loop-back	· Terminal · Monitor · Loop-back	· Pass through · Terminal · Monitor · Loop-back	· Pass through · Terminal · Loop-back	· Terminal · Pass through, Monitor · Loop-back
Latency	· One-way delay with GPS · Round Trip Delay (RTD)	· No OWD · Round Trip Delay (RTD)	· OWD with GPS and CDMA · Round Trip Delay (RTD)	· No OWD · Round Trip Delay (RTD)	· No OWD · Round Trip Delay (RTD)
Packet Capture	· No	· Yes	· Yes	· Yes	· No
Streams	· 8 streams	· 8 streams	· 10 streams	· 16 streams	· 16 streams
Measurements	· BERT · Alarm Detection/Genera	· BERT · Alarm Detection · Service Disruption Time · PBB (MAC-in-MAC)	· BERT · Alarm Detection · Service Disruption Time	· BERT · Alarm Detection · Service Disruption Time	· BERT · Alarm Detection/Genera · Service Disruption Time · PBB (MAC-in-MAC)
Protocols	· DHCP, ARP, DNS · Ping, Traceroute	· DHCP, ARP, DNS · Ping, Traceroute · FTP, HTTP	· DHCP, ARP, DNS · Ping, Traceroute · FTP, HTTP	· DHCP, ARP, DNS · Ping, Traceroute · FTP, HTTP	· DHCP, ARP, DNS · Ping, Traceroute
Bandwidth Profiles	· Constant, Burst, Ramp, Random	· Constant, Burst, Ramp	· Constant, Ramp, Bursty, Flood	· Constant, Burst, Ramp	· Constant, (Burst), Ramp
Ethernet OAM	· No	· Yes	· Yes	· Yes	· Yes
RFC-6349	· No	· Yes	· Yes	· Yes	· Yes
RFC-2544	· Symmetric · Asymmetric (with GPS) · Throughput, Back-to-back, Frame loss, Latency, System recovery	· Symmetric · Asymmetric · Throughput, Back-to-back, Frame Loss, Latency	· Symmetric · Asymmetric · Throughput, Back-to-back, Frame loss, (Jitter), Latency, System recovery	· Symmetric · Throughput, back-to-back, frame loss and latency	· Symmetric · Asymmetric (with GPS) · Throughput, back-to-back, frame loss and latency
Y.1564 (eSAM)	· Symmetric · Asymmetric (with GPS)	· Symmetric	· Symmetric · Asymmetric	· Symmetric · Asymmetric (?)	· Symmetric · Asymmetric (with GPS)

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Frames	- EI (PCM-30/C, PCM-31/C) - DSI (Q4-2015)	- E1, E2, E3 - DSI, DS3	- E1, OC-3 to OC192 - STM-1 to STM-64	- E1, OC-3 to OC192 - STM-1 to STM-64	- E1, OC-3 to OC192 - STM-1 to STM-64
Modes	- Terminal Monitor, Pass-through, Loop-back, Mux-Demux, Analogue	- Terminal Monitor, Pass-through, Loop-back, Analogue	- Terminal Monitor, Pass-through, Loop-back, Analogue	- Terminal Monitor, Pass-through, Loop-back, Analogue	- Terminal Monitor, Pass-through, Loop-back, Analogue
Measurements	- Attenuation - Frequency, Freq. deviation	- Attenuation - Frequency	- Attenuation - Frequency, Freq. deviation	- Attenuation - Frequency, Freq. deviation	- Attenuation - Frequency, Freq. deviation
Analysis I	- G821, G826, M2100 - CAS, G711	- G821, G826, M2100 - CAS, G711	- G821, G826, M2100 - CAS, G711	- G.821, G.826, G.828, G.829, M.2100, M.2101	- G.821, G.826, M.2100
Latency	- Round Trip Delay (RTD) - One-Way Delay (OWD)	- Round Trip Delay (RTD)	- Round Trip Delay (RTD)	- Round Trip Delay (RTD)	- Round Trip Delay (RTD)
Pulse Mask	- Yes	- Yes	- Yes	- No(?)	- No(?)
EI/TI Jitter	- Analysis - Jitter Generation	- Analysis - Jitter Generation	- Analysis - Jitter Generation	- No	- No
EI/TI Wander	- TIE, MTIE, TDEV - Wander Generation	- TIE, MTIE, TDEV - Wander Generation	- TIE, MTIE, TDEV	- No	- No

C37.94

C37.94					
SFP	- Special SFP developed with manufacturers for C37.94 - SMF and MMF	- SMF and MMF	- No	- No	- No
Modes	- Terminal	- Terminal and Pass	- No	- No	- No
Settings	- Unframed or framed operation - Bit-rate from 64 kb/s to 768 kb/s	- Framed operation - Bit-rate from 64 kb/s to 768 kb/s	- No	- No	- No
Clock	- GPS, 1pps, Recovered and Internal	- External, Recovered and Internal	- No	- No	- No
Impairments	- Freq. offset generation 25000ppm	- Freq. offset generation 25000ppm	- No	- No	- No
Tests	- BER and ITU-T G.821 - Defects: LOS, AIS, LOF, RDI, LSS, All 0, All 1 detection & generation - Anomalies: FAS, TSE, Slip detection & generation - Pass / fail indications	- BER and ITU-T G.821 - LOS, AIS, RDI, FAS, LSS, TSE detection - BITS, FAS, LOS, AIS, RDI generation	- No	- No	- No
Measurements	- Optical Power meter - Frequency, Freq. Deviation - Data rate	- Optical Power meter - Data rate	- No	- No	- No
Latency	- Round Trip Delay (RTD) - One-Way Delay (OWD) with GPS	- Round Trip Delay (RTD) - One-Way Delay (OWD) with GPS	- No	- No	- No

Analog Voice Frequency

Analog Voice Frequency					
Voice Frequency (VF)	- Measurement, generation - Add/drop	- Measurement, generation - Add/drop	- Yes	- No	- No
Latency	- Round Trip Delay (RTD) - One-Way Delay (OWD) with GPS	- No	- No	- No	- No

Ether.Genius Ether10.Genius	VePAL TX320	MTS-5800	NetBlazer V2	Network Master Pro MT1000A
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Datacom					
Operation Modes	• Terminal, Monitor, Passthrough	• No	• No	• No	• No
Datacom	• Standard cables (CISCO) • From 50 b/s to 2048 kb/s • V.24/V.28 (RS-232), X.21/V.11 • V.35 , V.36 (RS-449) • EIA-530 / EIA-530A	• No	• No	• No	• No
Analysis	• BER and ITU-T G.821 performance • Logic analyser capability • Defects LOC, AIS, LSS, All 0, All 1 • Anomalies: TSE, Slip • Line attenuation, frequency, deviation	• No	• No	• No	• No
Latency	• Round Trip Delay (RTD) • One-Way Delay (OWD) with GPS	• No	• No	• No	• No

Comments:

1. EXFO and ANRITSU are not really in the transmission and synchronization field testing because of several reasons, the most important is that they are not up to date in features and regarding prices are not consistent with the market.
2. ALBEDO Ether.Genius is the only test equipment that can compute the constant TE (cTE) and dynamic TE (dTE) components of the Time Error. Sometimes, ITU-T performance figures are given in terms of the TE but sometimes they are given in terms of cTE and dTE. You need to know which of them to apply to know if your test is passed or failed.
3. Veex includes a CSAC with has a performance level between Rubidium and the best OCXOs available in the market. Frequency accuracy, and holdover time is longer for Rubidium than in the CSAC.
4. xGenius includes generation capabilities in most interfaces and not only an analysis function. You can for example generate wander in E1 or SyncE interfaces. We are again quite unique in this kind of generation features.
5. Only xGenius can run the Floor Delay Population test. I admit that this metric is important in frequency delivery application only and not in phase / frequency applications that are likely to be the most important for most customers today.
6. Many current timing distribution solutions require physical layer synchronization through SyncE to be added to packet synchronization. In these deployments it is important a solution that enables simultaneous verification of IEEE 1588 and SyncE. Only xGenius is able to run it.
7. Ether.Genius offers an OCXO configuration which works perfectly well in many applications and supports the same tests that the Rubidium configuration. Many times there is no need to go to an expensive Rubidium configuration like in the Viavi solution.
8. Ergonomics: Carrying with a bulky module for the MTS5800 does not seem a very convenient solution (or at least not very elegant solution) for a field testing tool.