ALBEDO Telecom

the Path to Excellence

ALBEDO Ether.Giga is a Gigabit tester equipped with all the standard features of field testers, plus the new ones like RFC 2544, Y.1564 and capable to verify the QoS and SLA of brand new Multiplay and IP services.

Datasheet

ALBEDO Ether.Giga

Ether.Giga is a dual port tester, multistream and compatible with the new ITU-T standards. The equipment includes traffic generation and analysis features up to 1 Gbit/s, equivalent to 1.5 millions of frames, if frame size is set to 64 bytes. If the equipment is connected in through mode, it accepts and forwards frames at wirespeed.

1. Ethernet PHY

1.1 Interfaces

- *SFP*: *10BASE-T*, *100BASE-TX*, *100BASE-FX*, *1000BASE-T*, *1000BASE-SX*, *1000BASE-LX*, *1000BASE-ZX*
- *RJ-45*: *10BASE-T*, *100BASE-TX*, *1000BASE-T*
- On/off laser control for optical interfaces

1.2 Auto-Negotiation

- Rate negotiation, allow 10 / 100 / 1000 Mb/s
- Ability to disable auto-negotiation and force line settings

1.3 Power over Ethernet

- PoE (IEEE 802.3af-2003) and PoE+ (IEEE 802.3at-2009) detection
- PoE interfaces: 10BASE-T, 100BASE-T and 1000BASE-TX through attached RJ-45 ports A and B
- PoE pass-through when the equipment is configured in transparent (through) operation mode

2. Operation Modes

- *Ethernet Endpoint operation*: The equipment generates and receives Ethernet PCS codes and Ethernet frames
- *IP Endpoint operation*: The equipment generates and receives IPv4 datagrams
- *IP / Ethernet Through operation*: Traffic is forwarded between port A and B

3. Ethernet MAC

- Traffic generation and analysis features up to 1 Gb/s (1.5 millions of frames, if frame size is set to 64 bytes)
- Frame formats: *DIX*, *IEEE 802.1Q*, *IEEE 802.1ad / Q-in-Q*
- Support for Jumbo frames with MTU up to 10 kB
- Setting of *source* and *destination MAC addresses* as a single value or as a range
- Setting of the *Type / Length* value
- Configuration of *VID* and *priority codepoint* in VLAN modes
- In Q-in-Q / IEEE 802.1ad modes, configuration of the S-VLAN *VID*, *DEI* and *priority codepoint*. Configuration of the C-VLAN *VID* and priority *codepoint*
- Configuration of the *frame size*
- Insertion of FCS errors (both in endpoint and through modes) and undersized frame using the following insertion modes: single, burst, rate and random.

4. MPLS

- MPLS generation and analysis in IP Endpoint mode. Analysis in Ethernet / IP Through mode.
- Support of a single and double label stack. The label is formatted as specified in RFC 3032.
- Configuration of the TTL, exp and label fields for Top and Bottom MPLS headers.

5. IPv4

- Configuration of *source* and *destination IPv4 addresses* as a single value or as a range
- Configuration of *DSCP* CoS labels, *TTL, transport protocol*
- If transport protocol is UDP, support of UDP frame with *source* and *destination port* configuration
- Insertion of IPv4 checksum errors (IP endpoint mode) using the following insertion modes: single, burst, rate and random.

6. Traffic Generator

- Generation over 8 independent streams. Each stream has its own specific bandwidth profile,pattern configuration

6.1 Bandwidth Profiles

- Modes: *Continuous*, *Periodic burst*, *Ramp* and *Random*

6.2 Test Patterns and Payloads

- Layer 2-4 BER test patterns: *PRBS* 2^{11}*-1*, *PRBS* 2^{15}*-1*, *PRBS* 2^{20}*-1*, *PRBS* 2^{23}*-1*, *PRBS* 2^{31}*-1* along with their inverted versions and user (32 bits)
- Test payload for SLA tests
- User payload: User configurable payload structure specified by means a payload field. Enables transmission of any protocol with a fixed payload, including Ethernet Pause frames, BPDUs or other.
- *All zeros* test pattern
- Insertion of TSE (endpoint modes) using the following insertion modes: single, rate and random.

7. Filter

- Up to 8 simultaneous filters can be applied to the traffic
- The equipment supports a generic filter which can select frames by using a *16 bit mask* and an arbitrary *offset* defined by the user

7.1 Ethernet Selection

- By *source* and *destination MAC addresses*. Selection of MAC address sets with masks
- By *Type / Length* value with selection mask
- By *C-VID* and *S-VID* with selection mask
- By *service* and *customer priority codepoint* value with selection mask

7.2 MPLS Selection

- Separated filters to account for the Top and Bottom MPLS headers.
- By label value. Specific option for selection of label ranges.
- By the value of the Exp field with specific option for selection of ranges.

7.3 IPv4 Selection

- Selection by I*Pv4 source* or *destination* address. It is possible to select address sets by using masks
- Selection by *protocol*

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- Selection by *DSCP value*

7.4 IPv6 Selection

- Selection by IPv6 source or destination address (or both at the same time). It is possible to select address sets by using masks
- Selection by IPv6 flow label
- Selection based on the next header field value
- Selection by DSCP value

7.5 UDP Selection

- Selection by *UDP port*. Either as a single value or a ranges

8. PHY Results

8.1 Cable Tests

- Optical power measurement (transmitted and received power) over compatible SFP transceivers
- For inactive links: Open/short fault indication and distance to fault in metres (accuracy: 1 m)
- For 10/100 Mb/s active links, the following results are reported: current local port MDI/MDI-X status
- For 1 Gb/s active links the following results are reported: current local port MDI/MDI-X status, pair polarities (normal/inverted), pair skew (ns)

8.2 Auto-Negotiation

- *Bit rate* and *duplex mode*

8.3 SFP

- *SFP presence*, current *interface*, *vendor*, and *part number*

8.4 Power over Ethernet

- Type of PoE: PoE (IEEE 802.3af), PoE+ (IEEE 802.3at), non-standard, none
- PoE voltage between pairs 1-2 / 3-6 and 4-5 / 7-8 in endpoint test. Voltage and current in pairs 1-2/ 3-6 and 4-5 / 7-8 in through mode

9. Frame Analysis

- Support of *local one-way* (port A-port B) and *two-way* (port A-port A) test modes
- Separate traffic statistics for Port A and B

9.1 Ethernet Statistics

- Frame counts: *Ethernet*, *VLAN*, *IEEE 802.1ad frames*, *Q-in-Q frames*, *control frames*, *pause frames*
- Frame counts: *unicast*, *multicast* and *broadcast*
- Basic error analysis: *FCS errors*, *undersized frames*, *oversized frames*, *jabbers*
- Frame size counts: *64 or less*, *65-127*, *128-255*, *256-511*, *512-1023*, *1024-1518*, *1519-1522*, *1523-1526* and *1527-MTU* bytes

9.2 MPLS Statistics

- MPLS packets (single label).
- MPLS packets (double label).

9.3 IP Statistics

- Packet counts: *IPv4 packets, IPv6 packets*
- Packet counts: *unicast*, *multicast* and *broadcast*
- *UDP packets*, *ICMP packets*
- *IPv4 errors*, *IPv6* errors
- *UDP* errors

9.4 Bandwidth Statistics

- *Current*, *maximum*, *minimum* and *average* (transmitted and received) traffic figures for port A and B
- Ethernet traffic statistics expressed in bits per second, frames per second and a percentage of the nominal channel capacity
- *Unicast*, *multicast* and *broadcast* traffic figures expressed as a percentage of the nominal channel capacity
- IPv4 and IPv6 statistics (bits per second)
- UDP traffic (bits per second)

9.5 SLA Statistics

- Multistream SLA analysis
- Delay statistics: ITU-T Y.1563 *FTD* (current, minimum, maximum, and mean values)
- Delay variation statistics: ITU-T Y.1563 *FTD* (standard deviation), ITU-T Y.1563 *FDV* (peak), RFC1889 / RFC 3393 *jitter* (current, maximum and mean values)
- Duplicated packets, out -of -order packets
- Frame loss: ITU-T Y.1563 *FLR*
- Availability statistics: *SES* and ITU-T Y.1563 *PEU*

9.6 BER

- *Bit error count*, *seconds with errors*, *bit error ratio* (BER)
- *Pattern losses*, *pattern loss seconds*

9.7 Network Exploration

- *Top talkers* statistics: Displays the most common source MAC / IP addresses
- *Top VID* (IEEE 802.1Q) or *C-VID* (IEEE 802.1ad): Displays the most common VID / C-VID tags
- Top LSPs statistics: Displays the 25 most common MPLS LSPs
- Atomatic setup of the eight available filtering blocks to match the items found in the top talkers list

10. Automatic Tests

- The equipment supports automatic normalized tests defined in IETF RFC 2544 and ITU-T Y.1564 (eSAM)
- Support of *local one-way* (port A - port B) and *two-way* (port A - port A) tests
- Support of Ethernet and IP test modes

10.1 IETF RFC 2544 Test

- Support of RFC-2544 *throughput*, *frame-loss*, *latency*, *back-to-back* and *recovery time* tests
- Symmetric (two-way) and asymmetric (one-way) tests when both transmission ends are connected to the same test equipment

10.2 eSAM Test

- Testing of up to eight services (non-color-aware mode) or up to four services (color-aware mode)
- Configuration of the *CIR* and *EIR* for each service
- Configuration tests (CIR, EIR and policing) with *FTD*, *FDV / jitter*, *FLR* results for each service
- Performance test with *FTD*, *FDV / jitter*, *FLR* and *availability* results for all services

11. Port Loopback

- Layer 1-4 loopback
- Loop frames matching current filtering conditions or loop all frames in layer 2-4 loopbacks
- Loop controls for broadcast and ICMP frames
- MPLS loop control: Replace or preserve labels

12. Ping and Trace-route

- Generation of on demand *ICMP echo request* (RFC 792) messages with custom destination IP address, packet length and packet generation interval
- Analysis of *ICMP echo reply* (RFC 792) messages with measurement of round trip time and lost packets
- Analysis of *ICMP Time-To-Live Exceeded* replies received in the trace-route test

13. Protocols

- *ARP* (IETF RFC 826)
- *DNS* (IETF RFC 1034, RFC 1035)
- *DHCP* (client side) (IETF RFC 2131)
- *Trace-route* application using UDP or ICMP

14. User Interface

- Direct configuration and management in graphical mode using the keyboard and display of the instrument
- Remote access for configuration and management in graphical mode from remote IP site thought the Ethernet interface of the control panel
- File management and download through web interface

15. Platform

- Configuration and report storage and export through attached USB port or SD card
- TFT display true Color 4.3” LCD, 480 x 272px
- Dimensions: 223 mm x 144 mm x 65 mm
- Weight: 1.2 kg (with rubber boot)
- AD/DC adapter (220 V AC / 50-60 Hz)
- Li-Po batteries (operation time 8/10 hs, recharge time 4hs)

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