LB-300 OVERVIEW
Gigabit Ethernet Asym/Symmetric Loopback Device

LB-300 is a smart companion for NuDOG-301 that enhances DUT functional tests for measurement test of network environments.

LB-300 that fulfills the test by one network link is a good solution for loopback test in network environment. LB-300 filters out broadcast, multicast and null DA (Destination Address) packets and resends the rest of incoming packets back to the same network cable by two selective methods; resends directly (Layer 1 Loopback) or resends with switched DA/SA (Destination/Source MAC Address) and recalculated CRC for different applications (Layer 2 Loopback) of the test.

For fixed network provider, Telecom and ISP Company, LB-300 and NuDOG-301 are suitable to test the throughput and latency performance of leased line or ADSL. Both LB-300 and NuDOG-301 act as packet generator that is located at CO and CPE side for packets transmission and receiving.

The distance and cable quality is the key factor that affects the transmission bandwidth of ADSL and leased line. The bandwidth is not guaranteed even though the bandwidth allowed is configured at central office. By a pair of LB-300 and NuDOG-301, technical personnel can test and realize the maximum downstream and upstream bandwidth available of the transmission media, such as ADSL by telephone line or wireless transmission for public service. The solution can verify if the transmission bandwidth meets the requirement that customer applied, or realize the maximum available bandwidth of the leased line or ADSL network if bandwidth from central office is unlimited.

With this affordable price and excellent functions for network measurement and test on-site, LB-300 and NuDOG-301 are one simple yet effective solution for data transmission test in cable wiring phase or troubleshooting phase for both WAN and LAN.

KEY FEATURES

- Support Round Trip (loopback) and End-to-End (bi-directional symmetric/asymmetric) test mode when LB-300 works with NuDOG-301
- As a loopback client that returns incoming test streams for loopback (round trip) test
- As a packet generator for bi-directional symmetric/asymmetric (End-to-End) network test
- Software utility DApps-2544 of NuDOG-301 can remote control the test for both NuDOG-301 and remote LB-300
- Test loopback, throughput and latency function when connected
- Handheld device embedded with built-in high capability NI-HM battery which can be charged by USB
- Distinctive LED indicators are able to pinpoint the status of current running network

BENEFITS

- Support loopback, network throughput and latency tests
- Compact and portable size that is easy to carry for on-site test
- Simple and convenient way to examine the maximum network bandwidth of asymmetric network such as ADSL
- Variety of test features when it works with test equipment (NuDOG-301) and software utility of Xtramus
- LEDs located on LB-300's back panel allow user to interpret network situation fast

MAIN APPLICATIONS

- Network bandwidth assurance and verification for ADSL or leased line
- Bandwidth test and verification for connection between different locations of office or building
- Throughput and Latency test of point to point wireless transmission for public service
- Solution of Last-mile test between CO (Central Office) and CPE (Customer Premises Equipment)

SPECIFICATION

Model Name	LB-300	
Supported Frame Format	➢ Ethernet II frame	➢ IEEE 802.3 frame
Interface Ports	**Left Side**	**Right Side**
	10/100/1000 Mbps UTP Ethernet Port × 1 (10/100 Mbps Half/Full Duplex, 1000 Mbps Full Duplex)	USB Port (Mini-USB Connector) × 1 Power Switch × 1
Test Mode	**Loopback Mode**	**Working with NuDOG-301 under Packet Generator Mode**
	Under Loopback Mode, LB-300 works as a loopback client that returns incoming test streams for loopback (round-trip) test, and supports TWO loopback modes: ➢ Layer 1 loopback that filters out broadcast, multicast and null DA packets and resend the rest of incoming packets directly ➢ Layer 2 loopback also resend packets with switched DA/SA (destination/source MAC address) and recalculated CRC for different applications	While working with NuDOG-301 under Packet Generator Mode, LB-300 works as a packet generator for bi-directional symmetric/ asymmetric (end-to-end) network tests which allows: ➢ Performing symmetric/asymmetric network throughput tests with two packet generator: NuDOG-301 and LB-300 ➢ Performing Round-Trip Latency Test that tests the average latency from packet generator (NuDOG-301) to the LB-300
Throughput Test	➢ Throughput result for frame length, 64/128/256/512/768/1024/1518 bytes, steps by steps, or configuration in specified range by user ➢ Throughput result according to user defined packet loss tolerance in percentage ➢ Throughput result in percentage that is based on 100 Mbps utilization ➢ Throughput result in FPS (frame per second)	
Latency Test	➢ Latency test for frame length, 64/128/256/512/768/1024/1518 bytes, steps by steps, or configuration in specified range by user ➢ Latency test result according to user defined utilization in percentage ➢ Average Latency in us(microsecond) ➢ Test result according to 2 definitions of RFC2544, Store and Forward, and Cut Through.	
Hardware Information		
Dimension	141 mm x 22 mm x 22 mm	
Temperature	➢ Operating: 0°C~ 40°C (32°F~ 104°F)	➢ Storage: 0°C~ 50°C (32°F~ 122°F)
Humidity	➢ Operating: 0% ~ 85% RH	➢ Storage: 0% ~ 85% RH
Power Source	Two built-in 3.7V NI-MH batteries which can be recharged via LB-300's Mini-USB Port while connected with PC	
Supporting Softwares		
Supporting Softwares	➢ For Loopback Mode with NuDOG-301, NuDOG-301 and utility software DApps-2544 are required ➢ LB Utility for updating firmware and FPGA	

LB-300 Battery Information

Link Mode	Utilization	Operation Time of Fresh Battery
1000 Mbps Gigabit Ethernet	100%	100 minutes
	10%	110 minutes
100 Mbps Fast Ethernet	100%	200 minutes
	10%	220 minutes
10 Mbps Ethernet Mode	100%	180 minutes
	10%	205 minutes
Battery Charging Time	**Charge Device**	**Charging Time**
	External Power Adapter	420 minutes if power is totally exhausted

GENERAL DESCRIPTION OF LB-300

LB-300 Outer Case

1	LEDs	3	Power Switch
2	Network UTP Port	4	Mini-USB Port

LB-300 LEDs

| Power	Power Status	Tx	Transmission
Speed	Link Speed	Rx	Receiving
▮⚡	Warning LED for low Battery	🔁	Connection Status
Asym.	Asymmetric Mode	CRC	CRC error occur
Loopback1	Layer 1 Loopback	Lost	Packet Loss
Loopback2	Layer 2 Loopback	<64	Packet length less than 64 bytes
Pass	Test Passes	Fail	Test Fails

APPLICATION MODE

Asymmetric (End to End) Network Test Mode
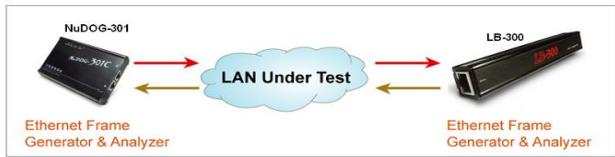
Under "End-to-end" mode, DUT is connected between NuDOG-301 and LB-300. Test packets are sent between NuDOG-301 and LB-300 in a one-way direction, while the DUT serves as the middle point.

## Loopback (Round Trip) Mode
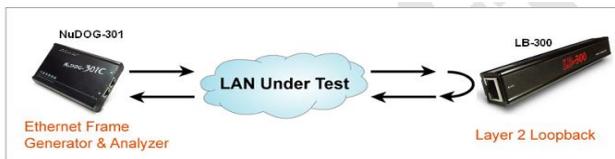
Under "Round-trip" mode, DUT is connected between NuDOG-301 and LB-300. Test packets are sent between NuDOG-301 and LB-300 in a loop-back manner, while the DUT serves as the middle point.

APPLICATION EXAMPLES

Loopback for Packet Generation Devices

For loopback (round trip) mode, LB-300 resend incoming test packets from other packet generation device back to its received port.

- LB-300 has to work with a packet generation device such as NuDOG-301 to execute the loopback test.
- Switch to Layer 1 loopback that resend incoming packets. However, for most Ethernet switch, it discards return frame with the same DA and SA (destination / source MAC address). Therefore, Layer 2 loopback can be used for the test.
- Switch to Layer 2 loopback (default value) that resend frames with swapped DA, SA and recalculated CRC. Ethernet switch forward these test packets to original packet generator (NuDOG-301).
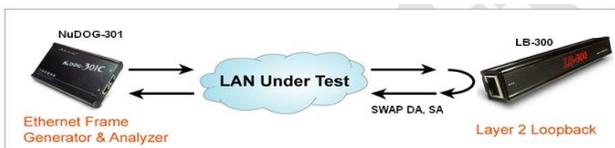
- Throughput test measures the maximum bandwidth of the whole loop forth and back
- Latency test measures the average latency of the whole loop forth and back

LB UTILITY
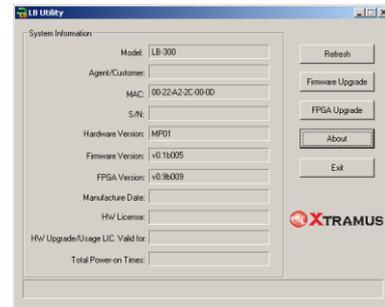
LB Series Utility Software is available for upgrading LB-300's firmware, FPGA, and checking related information (such as MAC Address and Serial Number).

RELATED PRODUCTS

NuDOG-301C

Handheld Testing Device with 2 Combo (SFP+RJ45) Ports

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