NuTEA-501

OVERVIEW

NuTEA-501 is a network impairment device that impair Ethernet network to emulate the unstable network condition, especially the network with complex topology, such as Internet in public network.

It is a compact, lightweight and highly cost effective device that provides the function to simulate Ethernet traffic impairment situation, such as CRC Error Packet, Drop Packet, Exchange Packet order (Re-order), Duplicate Packet and Modification (Data Integrity Error). By the selection of adjustable precision, user also can get the accurate test result to suit for test target.

This function is useful for the design of a new network device, because network transmission in the lab is always the best without any interference that can really reflect the real condition of public running network. This machine can generate almost any possible error that is similar to the real public running network. It is a chance that the network devices what your company design can face the real condition and find the problem before receiving complain from your customer after the network device had sold to customer.

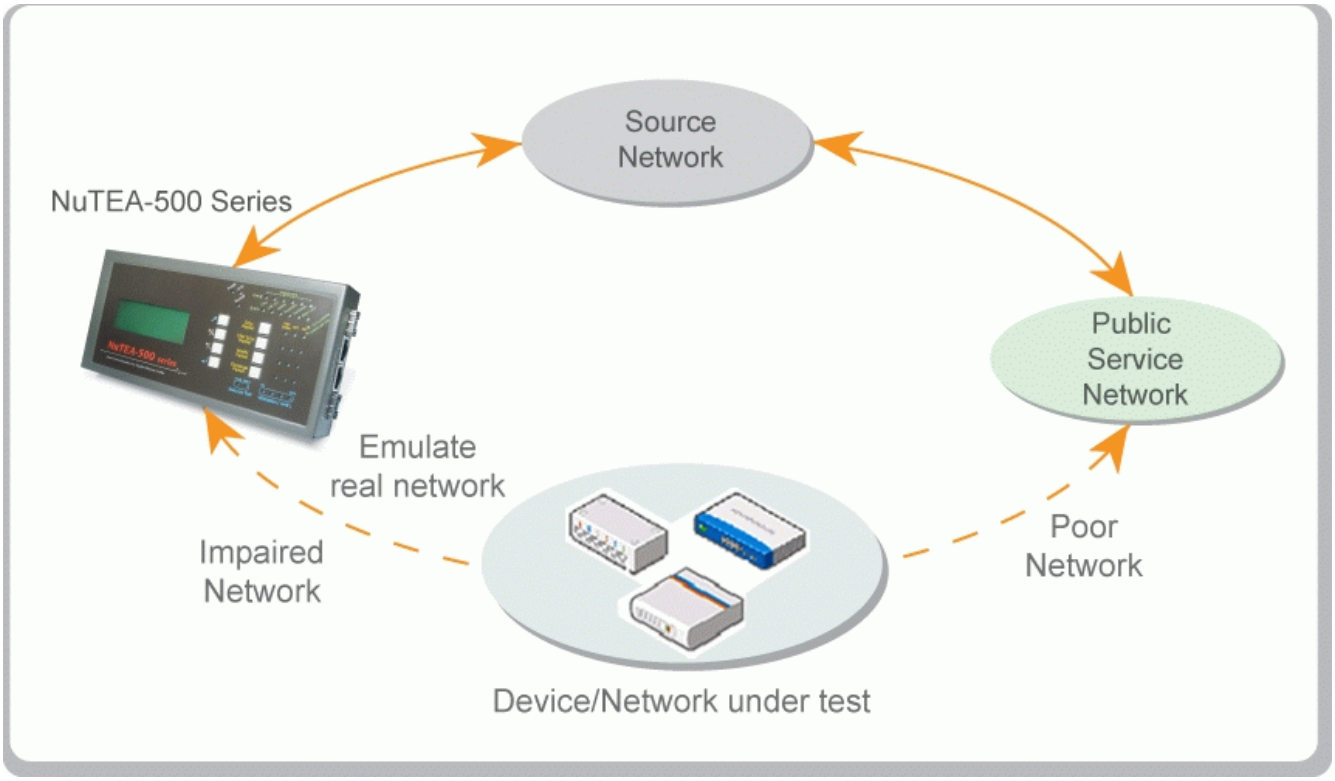
By the impairment task above, it makes a controllable blemish environment. User can test the own product performance through NuTEA-501 at the lab environment. User also can build a similar network and live environment in the demonstration for displaying the own product function. Allowed for dynamically changing impairment setting, NuTEA-501 provides user a controllable and convenient tool for real network simulation.

KEY BENEFITS

- Simulate the impairment network situation between the DUT. Building a small stimulant network environment for user
- Test the DUT performance about the impairment packet procession and validates the packet completeness
- Reduce the user product develop and research cost, fast the debug phase
- High performance and useful tool in quality check or production
- Increase the persuasiveness in the demonstration
- Simulates real Ethernet traffic impairment situation:
  - Packet Drop
  - Packet Modify
  - Packet Exchange
  - Packet Duplicate
  - Uni- or bi-direction simulation
  - Jumbo frame support
  - Adjustable precision up to 0.1%
- Supports Time base Impairment and packet base impairment
  - By packet: take the amount of packet for account standard
  - By Time: active 8 times per second
- Supports two RJ-45 and Fiber combo port
- Supports RMON Counters
- Supports on-panel setting
- Upgrades the Firmware and FPGA via USB interface

MAIN APPLICATIONS

- Performance and analysis test
  - Similar to the network performance in real network environment
  - Variety of embedded packet counters of NuTEA-501 can verify if the related packet counters of DUT are correct
- For troubleshooting
  - Emulate public network with more poor bandwidth and performance that can examine whether if the DUT has good disaster recovery and consolidate operation.
- Function validation test
  - Test equipment for mass production that might have error settings or damage that are not able to examine faulty DUT
- Assistant for product demonstration
  - Use NuTEA-501 as a good demonstration of packet loss or variation of network packet
- Functional examination for the products of bidding project for Telecom Service Provider



SPECIFICATIONS

Item	Content
Interfaces	➢ Two RJ-45 and Fiber combo ports. ➢ USB(for FPGA and Firmware upgrade and control)
Power	12V DC
Power Consumption	5.5 Watt (SFP Transceivers excluded)
LCD Display	➢ Device: Power, System, Counter display ➢ Status: Link, Speed, Active ➢ Counters: Unicast, Broadcast, Pause, Collision, CRC Error, etc.
Net Weight	Approx. 500g
Dimension	175 mm x 85.9 mm x 32.6 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, non-condensing Storage: 0% ~ 85% RH, non-condensing

TECHNICAL TERM and APPLICATION

Effect of Impairment

Drop Packet
Ethernet is a family of frame-based computer networking technologies. Frames are transmitted via different devices and media. After the transmission via different media and devices, some of frames might be lost. For layer 2 switching mode of OSI model, packet is the same as frame.

CRC Error Packet
At the tail of a packet, it keeps a checksum value to verify the correctness of the packet when it is received. If the checksum value is not correct that can verify the correctness of the packet, we call it CRC Error Packet.

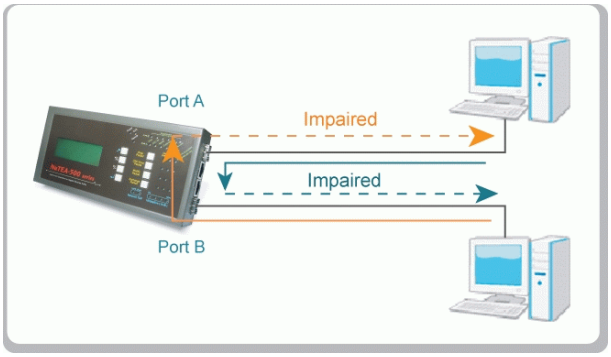
Modify Packet
For some reason intentionally or unintentionally, the content of packet is modified, owing to poor transmission or manual interference.

Exchange Packet
All of frame/packet should be transmitted sequentially, then it is able to reunite to complete data at destination device. If the frame/packet sent goes different routes, it might be possible that later packet arrives destination earlier, so the sequence of packet is changed, owing to poor device or manual interference.

Duplicate Packet
Packet is transmitted one by one via network device. For some reason, the destination had received the packet, however the sending side does not received the acknowledgement, so packet is resent and duplicated packet is generated.

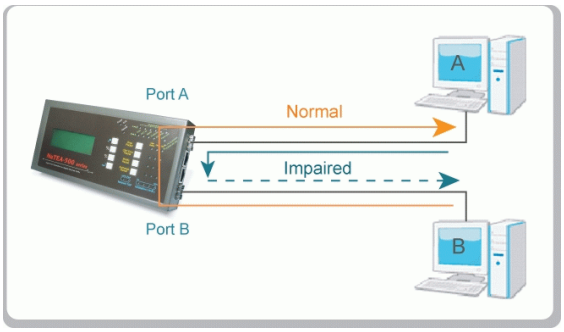
Direction of Impairment

Two Ways Impairment (Default)
The illustration below shows the concept of impaired network. It is an example that normal network is impaired.



Data streams both way that flow through this machine is impaired

One Way Impairment (User Define)
The illustration below impairs network flow from port A to B only. There is no influence on the network from port B to A

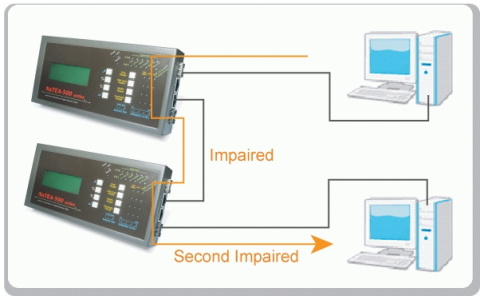


Operator can activate impairment by button with user define selections

Impairment from Multiple Devices

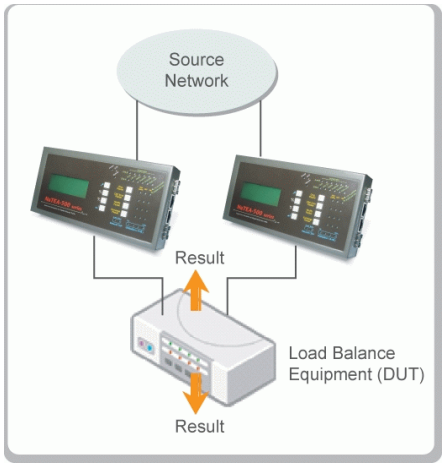
If a single unit of this machine is not enough to generate the impairment environment required, you can connect it in serial or in parallel to create any kinds of possible impairment structure.

In Serial
NuTEA can be cascaded to create multiple impairment



In Parallel

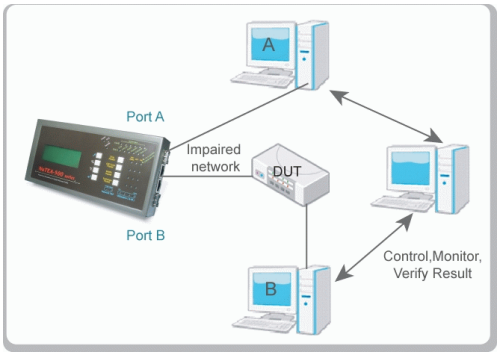
NuTEA can be connected in parallel to emulate impairment from different source network.



Test and Examination for Lab or Project Bidding

Good network device should have correct reaction on the network data streams that flow through it. For a good device, it not only deals with normal network data streams without problem, it should also perform well if the network is under poor condition.

Poor network is common seen in public service network, however, it does not happen often in your office or lab. To ensure the design of network device in your Lab has correct reaction on poor network condition, create a poor network environment to test is required.
Buyer of bidding project also can verify if the equipment purchased meets the specification.



In the illustration figure above, a good DUT should have correct reaction on impaired network and the computer A and B should get all data correctly. In addition, If A and B get all data correctly, does it fit the performance or recovery action required.

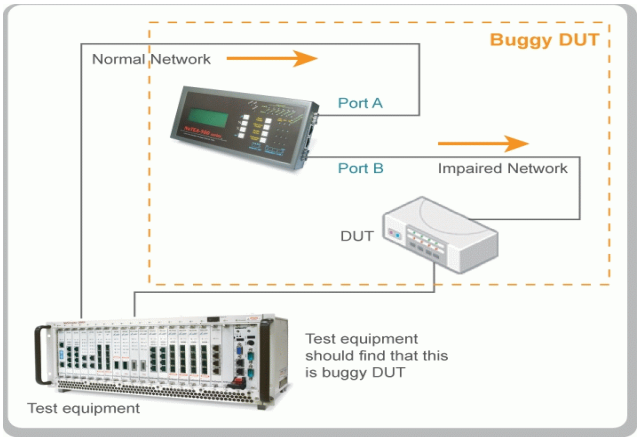
Calibration on Test Equipment for Mass Production

It always has quality control for mass production product, nevertheless, poor or abnormal network products still sold in market after it has passed the quality control examination.

For some cases, it is because manufacturer seldom or never calibrates the test equipment. If test equipment is not correctly calibrated or configured, it may not examine the poor or problem network products.

By the combination of the network product manufactured and this machine, operator can emulate a product with poor condition or problem. Use test equipment to test this combination, test equipment should find that there is problem on this combination. If the test machine is not able to find it, then calibrate or re-configure the test equipment is required.

The illustration below shows the connection to calibrate the test machine.



Operation of NuTEA

Control via Button

Almost all function can be operated via button at top panel

Buttons for Configuration

Label	Action	Description
	Push once	Enter main menu or Return to previous menu
▲/+	Push once	Move up one selection
▼/-	Push once	Move down one selection
	Push once	Execute the selected selection
	Hold for 3 seconds	Confirm (Yes/No) to clear all statistics counters by **▲/+** or **▼/-** button

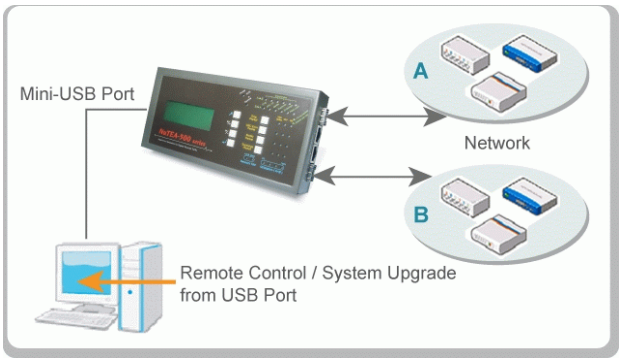
Buttons for Operation

Drop Packet	Push once	Start/Stop drop packet impairment with different scale (user define or default)
CRC Error Packet	Push once	Start/Stop CRC Error Packet impairment with different scale (user define or default)
Modify Packet	Push once	Start/Stop Modify Packet impairment with different scale (user define or default)
Exchange Packet	Push once	Start/Stop Exchange Packet impairment with different scale (user define or default)

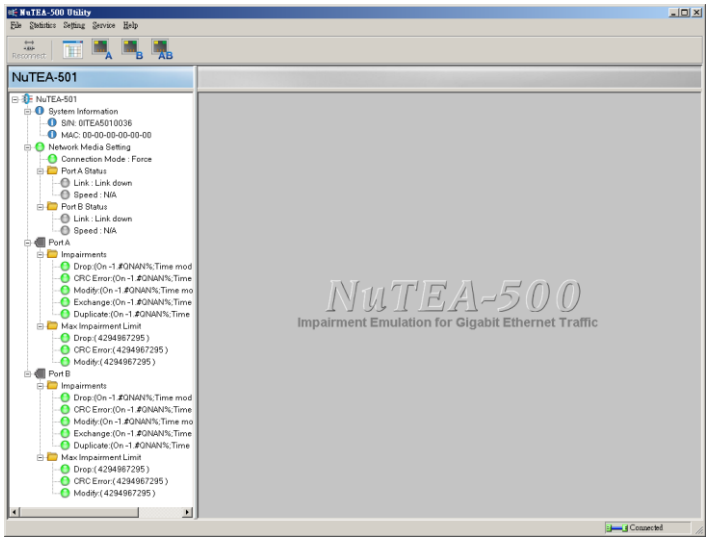
Remote Control from USB

NuTEA-501 comes with a Windows software for controlling of this machine. Operator can operate this machine via USB port with Windows interface, and also collect statistic counter and do system upgrade.

USB cable with mini-USB connector comes with the package of this machine. It is an industrial standard cable with standard male USB connector and standard male mini-USB connector at each side.

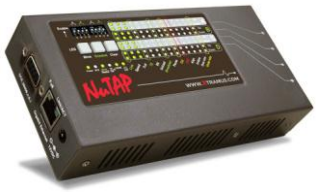


NuTEA Remote Control Software is a Windows based software as illustrated below. It is user-friendly and easy to operate.

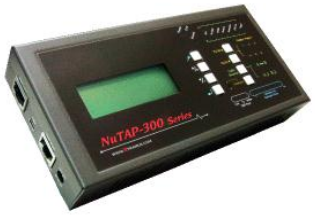


RELATED PRODUCTS

NuTAP:
Active Network TAP with four pairs of Ethernet 10/100M RJ-45 Port.



NuTAP-302:
Gigabit Active Network TAP with one pair of 10/100/1000M RJ-45 / SFP combo network ports



NuTAP Rackmount series:
NuTAP Rackmunt series includes the model as below

- **NuTAP-L Series:**
  - Full-Duplex In-Line Management Network TAP
  - 10/100/1000M UTP Interface
- **NuTAP-R Series:**
  - Full-Duplex In-Line Management Network TAP
  - 10/100/1000M Combo Interface(UTP+SFP)
- **NuTAP-A Series:**
  - Full-Duplex In-Line Recordable Network TAP
  - 10/100/1000M Combo Interface(UTP+SFP)

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