



NuStreams-5G

5 Ports Gigabit Ethernet Switch Tester



NuStreams-5G OVERVIEW

NuStreams-5G is a five-port Gigabit switch tester dedicated to test switches. Not merely a stand-alone Gigabit switch tester, NuStreams-5G can also be connected to PC for accessing its simple and easy-to-use configuration utility.

NuStreams-5G provides 3 RUNs; each contains 5 tasks. Their functions including simultaneously testing 10M/Full&Half, 100M/Full&Half, and 1000M/Full with a single button. This innovative design greatly reduces the time consumed when performing product tests.

A single NuStreams-5G can only test 5 Giga-bit ports. In response to numerous 8-port Gigabit switches available in the market, two NuStreams-5Gs can be cascaded in order to performing tests on 8-ports switches.

Built to be light and easy-to-handle, NuStreams-5G is designed to meet the needs of production lines.

Considering the buttons on NuStreams-5G might be too small to operate, an optional keypad NuPAD is available to solve this inconvenience. Although possessing no configuration functions, the lighter and smaller NuPAD provides 3 big, durable buttons (RUN 1~3) for users to operate the test procedure easily without touching configuration buttons on the top panel of NuStreams-5G.

KEY FEATURES of NuStreams-5G

- Hand-held 5-port Gigabit Switch Tester
- Two NuStreams-5Gs can be cascaded to support 8-port Gigabit switch test.
- Performing 5 Tasks simultaneously with only one button to reduce the total testing time greatly.
- Ability to save and access 3,000 test results for users to track the testing time and results.
- LCD screen for displaying test results and related statistics.
- High precision 1 ppm temperature-compensated oscillator with accurate clock speed to ensure the reliability of the tests.
- Console Control Interface
- Getting test results and logs with greater precision.
- Optimized User Interface
- Xtramus' new Rapid-Matrix technology makes testing procedures faster.



Key FEATURES of NuPAD

- Simple and easy to operate, users can perform tests fast.
- Easy for maintenance. NuStreams-5G connected to NuPAD do not need maintenance if NuPAD malfunctions.
- Intuitive Buttons for production crews to verify test results fast.



NuStreams-5G SPECIFICATIONS

Model Name		NuStreams-5G	
Support frame format		<ul style="list-style-type: none">Ethernet II Frame	<ul style="list-style-type: none">IEEE802.3 frame
Ports & Buttons			
Ports		<ul style="list-style-type: none">Switch ports: 5 x 10/100/1000 Mbps UTP Ethernet test portsManagement Port: 1 x 100 Mbps UTP port, managed via IP AddressConsole Port for NuPAD: 1 x 38400 bps UTP port	
Buttons		<ul style="list-style-type: none">4 buttons serve as test Configuration Buttons4 buttons serve as test Operation Buttons	
System Status & Testing Result Feedback Interface			
LEDs	System Status	<ul style="list-style-type: none">Power: Power ON status	<ul style="list-style-type: none">SYS: Ready status of this machine
	Test Status	<ul style="list-style-type: none">Pass: DUT pass the test	<ul style="list-style-type: none">Fail: DUT does not pass the test
	Test Hotkey Status	<ul style="list-style-type: none">Pause: Pause current running testRun 1/2/3: Test Task of Run 1/2/3 is running	
	Test Step Status: Test starts from step 1 to 4	<ul style="list-style-type: none">1. Link status test3. Test starts	<ul style="list-style-type: none">2. Auto negotiation connection test4. Test Finished and test results can be checked
	LAN Ports (1~5) Status	<ul style="list-style-type: none">Link/ACT: Network connection statusError: Indicate error occurrence in specific port	
LCD	Status Displayed by Log	<ul style="list-style-type: none">Test Start TimeTest End TimePackets TransmittedPackets ReceivedError PacketsTest Fail/PassThroughput (packets/second) base on pre-defined allowable tolerance	
Speed and Link Mode			
		<p>Auto Negotiation / Forced Mode:</p> <ul style="list-style-type: none">10/100 Mbps Half / Full Duplex1000 Mbps Full Duplex	
Test Mode			
Auto Test (AT)		Customized pre-defined network test templates to test the DUT.	
Traffic Generation & Receiving			
Traffic Generation		<ul style="list-style-type: none">Wirespeed or UtilizationFix frame length, 64/128/256/512/768/1024/1518/1600 bytes or randomDifferent testing time scales from 1 sec ~ 5 minutesGenerate test stream from 2 to 5 ports for DUT of different ports that join the test3 individual Run (Run1, 2, 3) for traffic generation (individual Run for tests cannot run at once)Each Run includes maximum 5 tasks (Auto Test)	
Traffic Receiving		User-defined or pre-defined Excess/Loss tolerance for identifying Pass/Fail result of Auto Test	
Utility Softwares			
Utility Functions		<ul style="list-style-type: none">System ConfigurationDownload & Examine LogsUpgrading Firmwares	



NuStreams-5G SPECIFICATIONS (Continued)

Main Frame Spec	
Dimension	176 mm X 128 mm X 32.6 mm
Temperature	<ul style="list-style-type: none">Operating: 0°C~ 40°C (32°F~ 104°F)Storage: 0°C~ 50°C (32°F~ 122°F)
Humidity	<ul style="list-style-type: none">Operating: 0% ~ 85% RHStorage: 0% ~ 85% RH
Power Source	<ul style="list-style-type: none">External Power Adapter with Built-in battery for keeping track date and time<ul style="list-style-type: none">➤ Input: AC 100V~240V, 50 Hz~60 Hz➤ Output: DC 12 V
NuStreams-5G Applications	
<ul style="list-style-type: none">Performing quality assurance/control tests for network device in production-scale during manufacturingPerformance validation of network productTroubleshooting at service/maintenance outlets	



Advantages

- Testing 5-port Gigabit Ethernet switches without expensive and bulky chassis test equipments.
- A stand-alone Gigabit Ethernet switch tester that can test DUTs without PC
- Logs for every test can be downloaded from NuStreams-5G's memory for detailed analysis.
- Configurations are password-protected, preventing mass-production line staff from changing settings by accident.
- Intuitive Pass/Fail LEDs for unskilled operators to identify the test results easily.
- Each Run button represents 5 test tasks, and each of these tasks can perform batch tests under different test criteria.
- NuPAD, an optional extension keypad, allows operators to switch test Runs between Run1, Run2, and Run3 without pressing NuStreams-5G's control button.
- Error LEDs which can display messages if any errors occur on any tasks during testing process.
- Packet loss tolerance can be adjusted to meet different test requirements.

TEST Mode

In Test Mode, all test parameters can be customized by users. Research & Development department staffs can issue a specification of a product they designed. The staffs in production factory can input the parameters base on this product specification provided by the R&D department into NuStreams-5G, and perform tests on DUTs. Those DUTs that pass the test will meet the standard established by the R&D department and can be sold to the market, while those DUTs that fail the test will be discarded. If too many DUTs failed the test, the R&D department might have to modify their designs, or the production factory staffs should lower NuStreams-5G's testing standard.

Pass/Fail LEDs will display the results base on customized packet loss tolerance.

	Test Items	Parameter
Auto	Media Type	10M Half / 10M Full / 100M Half / 100M Full / 1000M Full
	Test Ports	12 / 123 / 1234 / 12345
	Frame Length	64 / 128 / 256 / 512 / 768 / 1024 / 1518 / 1600 bytes in Fix Length Mode
	Length Mode	Fix / Random
	Test Time	1~10s / 30s / 1min / 2mins / 3 mins / 5 mins
	Excess/Loss Tolerance	0/100/1000/3000/5000/7000/9000/9999 packets
	Utilization (%)	10/30/50/60/70/80/90/100%
	Nway Delay	0~10s
	Nway Time	1~10s
	Learning Time	1~10s
	Learning Delay	0~10s
	Loss Tolerance	*0~9999 packets
	Excess Tolerance	*0~9999 packets

Parameters for Tests on DUTs

Almost all configurations can be set and interpreted by NuStreams-5G's buttons and short messages displayed on its LCD.

Note:

- Some configurations have to be done by Utility software after connecting a PC to NuStreams-5G via its UTP port.
- All criteria between testing steps are accessible through utility softwares. For example, Utilization (%) can be tuned between 1% to 100%.



GENERAL DESCRIPTION

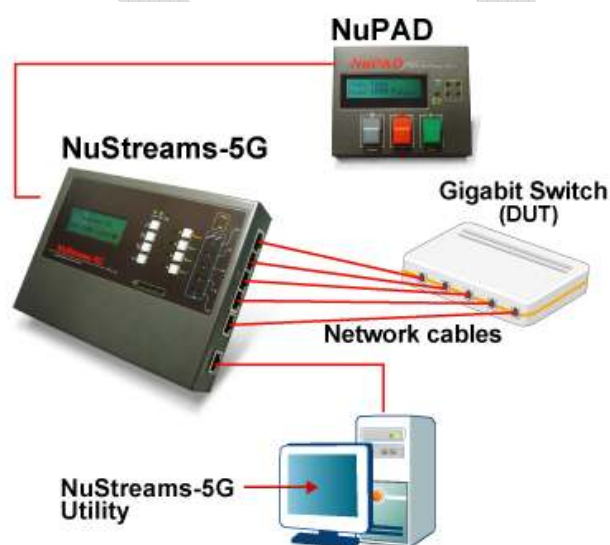
With intuitive control panel, LCD and LED-indicators, NuStreams-5G is easy-to-operate. Please refer to the pictures down below for more information.



❶ Configuration & Operation Buttons	❾ Pass / Fail LED
❷ NuPAD Console Port	❿ Link/ACT, Error LED
❸ LCD Display	⓫ Ports for Test to DUT
❹ Power Jack	⓬ Status LED of Test Steps
	⓭ Management Port

Hardware Connection

The picture down below illustrate an example of testing Ethernet switch. Five of Gigabit switch's ports can be tested at the same time. Also, NuStreams-5G can perform tests to DUTs without the presence of a PC.



Testing DUTs with NuStreams-5G

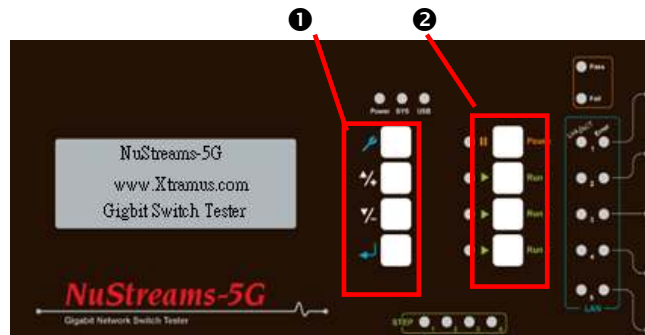
- NuPAD, an optional keypad with intuitive platforms and easy-to-use buttons, can be connected to NuStreams-5G in mass production line.
- NuStreams-5G is a stand-alone device. It can operate without NuPAD.
- NuStreams-5G PC utilities can configure test parameters or download testing logs when finished.
- NuStreams-5G is a stand-alone device that can record the logs of each test in the built-in memory and they can be retrieved later for problem analyzing and tracing.
- The LCD screen on NuStreams-5G can serve either for configuration purposes or for viewing testing log.
- The LEDs on NuStreams-5G can show link status, test status, error status and the final result (Pass/Fail) of the test.
- In this Ethernet Switch test example, test packets will flow through all ports. The result (Pass/Fail) will be shown on NuStreams-5G's LEDs. If the DUT has less than 5 ports, disable unused NuStreams-5G port before starting the test.



OPERATION OF NuStreams-5G

Control Buttons

Almost all configurations can be set by NuStreams-5G's buttons. This feature allows user to perform tests without using PCs.



❶ Configuration Buttons	❷ Operation Buttons
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Configuration Buttons

Label	Action	Description
	Push once	Enter the Main Menu(*) or Return to the previous Menu.
▲/+	Push once	Move up one selection
▼/-	Push once	Move down one selection
↵	Push once	Execute the selected selection

*Menu is displayed on the left LCD screen.

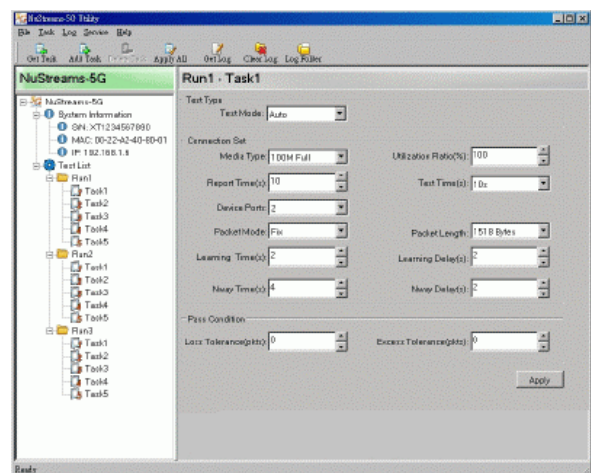
Operation Buttons

Label	Action	Description
Pause	Push once	Pause current running test
▶ Run1	Push once	Start Run 1 test. Up to 5 tasks can be configured in Run 1 hotkey. Press this button to test ALL TASKS AT ONCE .
▶ Run2	Push once	2 nd hotkey as above
▶ Run3	Push once	3 rd hotkey as above

Control via NuStreams-5G Utility

NuStreams-5G comes with a GUI (graphic user interface) utility for the configuration. By connecting NuStreams-5G with PC via its Management Port, users can configure the test parameters, download testing logs and upgrade firmware.

All parameters can be configured here, including all the configurations that can be set by buttons on NuStreams-5G's panel.





TECHNICAL TERMS

Frame (Packet) Size

A frame is a digital data transmission unit on the Layer 2 of the OSI model. It is used for data exchange between two points via a direct physical or logical link. Depends on the data a frame carries, the standard length (bytes) of Ethernet II frame is varied from 64 to 1518 bytes as the figure below

802.3 MAC Frame							
Preamble	SFD	DA	SA	EtherType	Payload	CRC	IFG
7 bytes	1	6	6	2	46-1500	4	12
		64-1518 bytes					
		72-1526 bytes					

SFD: Start Frame Delimiter

DA: Destination MAC address

SA: Source MAC address;

IFG: Interframe gap

NuStreams-5G is able to generate frames with length from short frame to long frame or Random size (sent frame size between 64 bytes and 1600 byte) for the test.

Utilization and Packet Loss Tolerance

Utilization

Utilization is the traffic flow of network and it is present by percentage. For example, if the connection speed is full duplex 1000 Mbps, then 80% Utilization means the traffic flow is 80% of 1000 Mbps data transmission.

Packet Loss Tolerance

If the traffic flow is high, it might be possible that all data transmitted is not received at destination. It is called Packet Loss, and it is calculated by number counts. For a fair network, partial packet loss is allowable, because protocol such as TCP/IP knows the packet loss happens and packet

will be re-sent to make sure that there is no data loss. The parameter is about how much packets are allowed for loss in the test. This function always works with Utilization.

The more Utilization rate, the more Packet Loss happens. User can tune Utilization rate and Packet Lost Tolerance to create a set of value for your DUT/NUT.

Nway (Auto Negotiation)

Auto-negotiation (Nway) is an Ethernet procedure by which two connected devices choose common transmission parameters, such as speed (10/100/1000 Mbps) and duplex mode. In this process, the connected devices first share their capabilities as for these parameters and then choose the fastest transmission mode they both support.

Nway Delay

This is a term for NuStreams-5G only. It means the test formally starts after the delay duration for Auto-negotiation above.

Nway Timeout

NuStreams-5G starts auto-negotiation for connection. If the duration exceeds the Timeout value configured and auto-negotiation still does not make it. Then system reports Failed.

Learning Time

It delays the time to start test after learning packet is sent.

When learning packet (MAC address for other devices to know) is sent, the test delays for a while from 1~10 seconds by configuration buttons at top panel. It is quite useful for test in small scope or large scale of network chain with possible packets delay or learning delay of network device. When device get learning packet from NuStreams-5G, and keep it as record in MAC table, then the device knows the routing to NuStreams-5G.



ACCESSORIES

NuPAD

NuPAD is an assistant extension keypad that is especially made for operator at mass production line. For operator at product line, configures test criteria is not their duty.

Supervisor can configure the settings in advance and locks the settings with password, and operator just press Start or Stop button to test and pick up faulty product.

Figure below is the NuPAD - Extension Keypad for NuStreams-5G



Buttons of NuPAD

❶ Power LED	❹ Pause test
❷ Test steps LED	❺ Stop test
❸ Pass / Fail LED	❻ Start test

There are three buttons for control of each Run.

Pause	Push once	Pause Test or start test again if it is paused
■ Stop	Push once	Stop Test
▶ Run	Push once	Run Test or start test again if it is paused
Pause + ■ Stop	Push at the same time	Switch around Run 1, Run 2 and Run 3

The Console Port of NuPAD can be connected to NuStreams-5G for remote control.



Console Port for Connecting NuPAD and NuStreams-5G

NuPAD's LEDs (such as Pass/Fail LED) are all synchronized with NuStreams-5G's corresponding LEDs.

NuPAD's LCD screen can display the test mode and task as well.



Status LED

Run1 task 1/1
Auto Test!

Status LCD

RELATED PRODUCTS

NuStreams-P9M:

10/100 Mbps Network Switch and Residential Router Tester



NuStreams-904:

10/100/1000 Mbps Ethernet burn-in tester for test in burn-in room



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