ARGUS
GigaBit Ethernet Manual

Version: 1.04 / **EN**

Important notice:
Depending on the scope of the functions delivered, certain menu items may be hidden.

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1 Introduction

xDSL+GigE Combi Tester

The ARGUS® combines all standard broadband interfaces (ADSL, VDSL, SHDSL) and fast Gigabit Ethernet interfaces with comprehensive Triple Play test functions in one measurement device. Without having to swap modules, the user can select or change the interface via the intuitive menu and perform tests at the push of a button.

The ARGUS® supports this with, amongst other things, two SFP slots and two copperbased Gigabit Ethernet interfaces. Thanks to the various Gigabit Ethernet SFPs, the tester offers the greatest possible compatibility for connection to fiber-based interfaces. It is thus possible to carry out Triple Play and performance tests directly on FTTx or GigE components via the GigE interface (copper or fiber).

Dual GigE and performance testing

A further option offered by the ARGUS® is the possibility of using two Gigabit Ethernet interfaces (Copper or Fiber) simultaneously (Dual GigE). It is thus not necessary to use a second device for end-to-end tests. Using a Loop function and a Traffic generator, the user can analyze the capacity of Ethernet segments or devices at full wire-speed (1 Gbit/s). Throughput tests in accordance with RFC 2544 are thus also possible. For HTTP and FTP downloads the interfaces can reach speeds of up to 300 Mbit/s.

Inspect PoE and Ethernet cabling

If the Ethernet cabling is defective, the ARGUS® can immediately locate the source of the fault through its comprehensive cabling tests (Ethernet-TDR). In this way, as well as shorts, opens and mismatches, amongst other things, the delay or polarity of wire pairs can also be determined. In addition, it is possible to check whether the receiver provides the voltage for different PoE categories.

An overview of a few of the important Gigabit Ethernet functions:

- **Gigabit Ethernet Traffic generator**
- **Gigabit Ethernet Loop**

Should you have any further questions, please contact us:

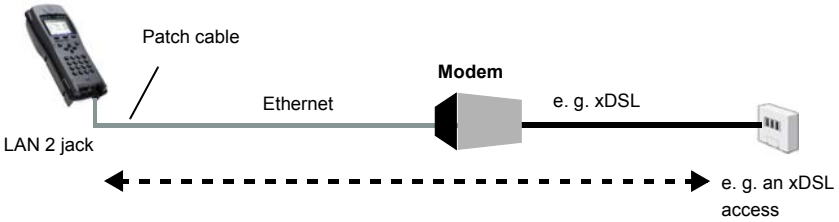
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2 Operation on an Ethernet access

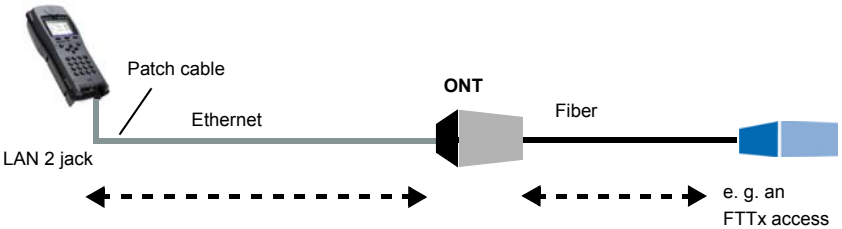
In Ethernet mode, the ARGUS supports the following types of access:

The individual tests record and store data. The user must comply with the statutory regulations governing the collection and storage of such data and his obligation to give notice in this connection.

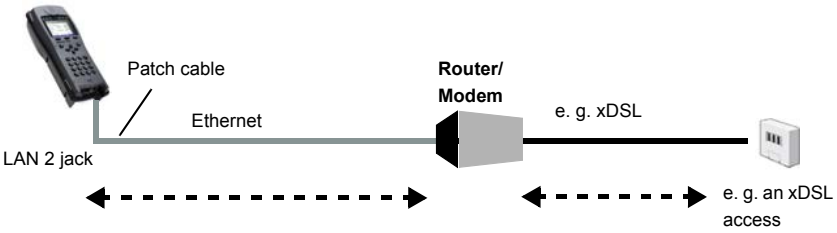
Connection to a Modem:



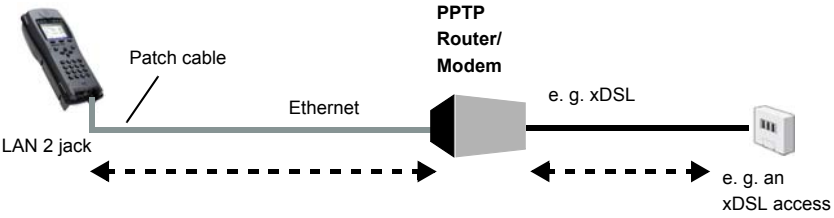
Connection to a fiber optic modem (ONT):



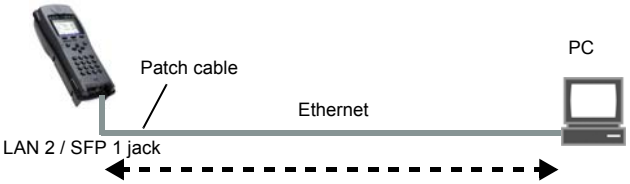
Connection to a Router/Modem:



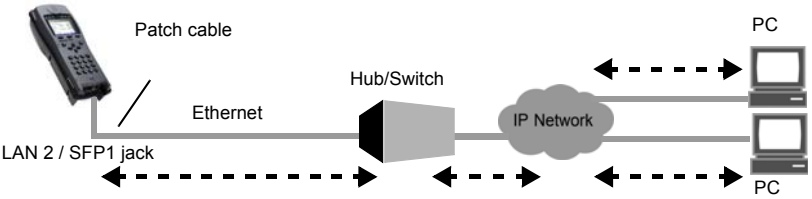
Connection to a PPTP Router/Modem:



Connection to a PC via IP



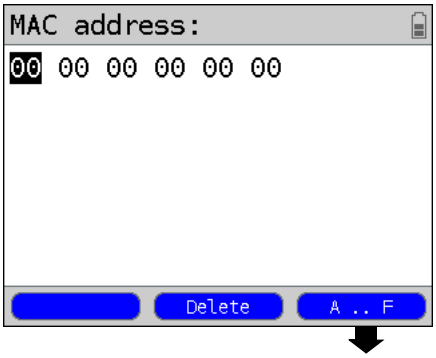
Connection to an IP network

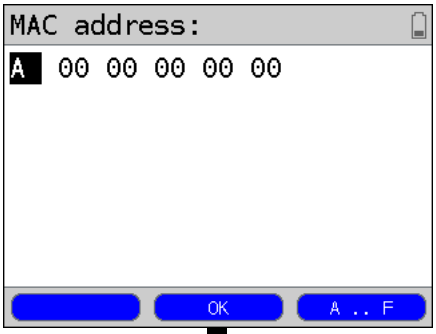


Settings in the profile:

Access parameters	
Ethernet	Autonegotiation on / off

2.1 Ethernet Settings

Setting	Explanation
Access parameters:	
Phys. parameters:	
Ethernet:	
Auto-negotiaion	Switch on or off. If autonegotiation is enabled, a network card can independently determine the correct transmission speed and duplex setting for the network port to which it is connected and can then configure itself accordingly. In the case of Ethernet, autonegotiation is based on Layer 1 of the OSI Model (in accordance with the IEEE 802.3u standard). Default setting: ***on*** For information on the **off** setting, see the next section page 9.
MAC address:	
	Display and selection of the MAC addresses. The first two MAC addresses cannot be changed manually. 1. If the default MAC address is selected, the ARGUS will use its own MAC address. Default setting: ***Default MAC address*** 2. If dynamic MAC address is selected, a different MAC address will be used for each synchronization. 3. A third MAC address can be entered: Mark a line and then press **<Edit>**.
	ARGUS shows the last used or the storing MAC address.  Move the cursor within the line. **<Delete>** Delete the character before the cursor

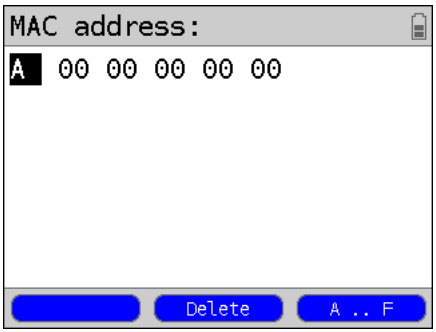


Enter the MAC address in hexadecimal from the keypad and the softkeys **<A..F>** (e.g. to enter a “C” press the softkey three times or for an “F” six times; conclude by pressing **<OK>** to confirm your entry). Group MAC addresses cannot be used.



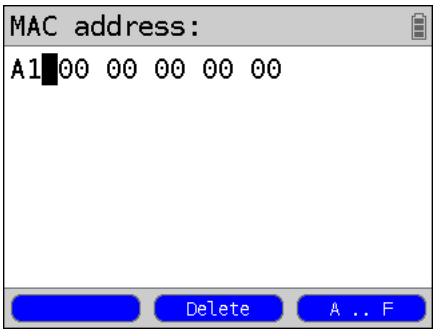
to

When entering an MAC address, the key combinations can be used to enter the letters A to F.



Use the softkey on the right to shift the keypad (the softkey on the right assumes a different meaning when pressed).

In this example select „1“.

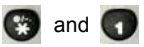




Move the cursor within the line.

<Delete> Delete the character before the cursor.

<A..F> Enter and select the characters A to F.

	One after the other 	Displays the ARGUS MAC addresses when you are in the ARGUS-Status: Line, LAN1, LAN2, SFP1, SFP2, ETH.

Autonegotiation / Ethernet link parameter

The default setting supports "autonegotiation" for the Ethernet link.

Setting: Autonegotiation "on"

When negotiating the link parameters, the ARGUS notifies the remote end that the following is supported (these settings are fixed; they cannot be reconfigured):

- 10, 100 or 1000 Mbit/s
- half or full-duplex
- Flow control on / off (when on: sym. and asym. pause)

Manual setting of the Ethernet link parameters

Setting: Autonegotiation "off"

When "autonegotiation" is deactivated, the speed, duplex mode, flow control (flow control = "Pause" mode) are set in the profile (s. page 7):

- 10, 100 or 1000 Mbit/s, Default setting: ***100 Mbit/s***
- half or full-duplex, Default setting: ***Full***
- Flow control on / off (flow control is only reasonable when operating in full duplex), Default setting: ***on***

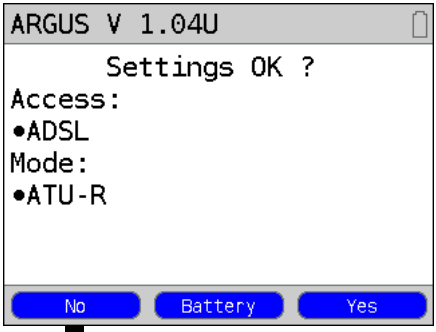


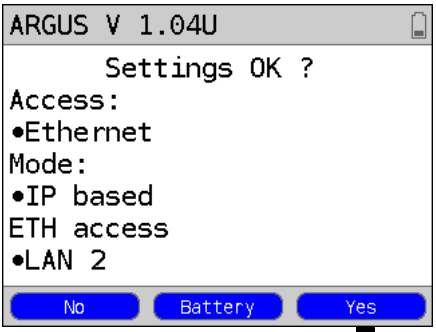
One-sided Autonegotiation

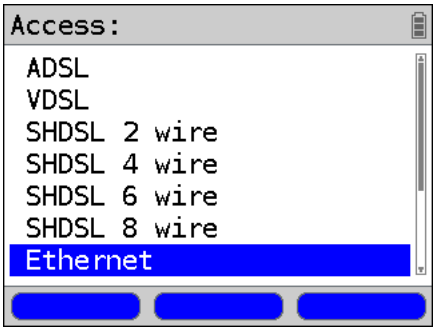
If a device which has autonegotiation enabled (on) attempts to connect to a device on which autonegotiation is disabled (off) or not supported, no information will be exchanged with the remote end. The speed will still be determined even without autonegotiation by listening for NLP signals (10Base-T) or a 100Base-TX idle pattern (parallel detection). In this case, the device using autonegotiation will generally fall back to half duplex (duplex mismatch is possible). This may lead to a conflict between the duplex modes with "poorer" performance.

2.2 Setting the Ethernet interface and access mode

Use the included patch cable to connect the ARGUS as a PC replacement to the modem, a ONT, a hub, a switch or a PC and then switch the ARGUS on. The initial display will depend on the access setting used last (in the examples ADSL and Ethernet):



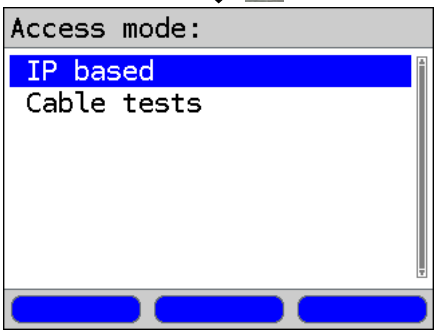




The access menu:

Using  Select a type of access; the selected type will be marked in blue (in the example, Ethernet).

The ARGUS will set the type of access to Ethernet. The access menu will open.

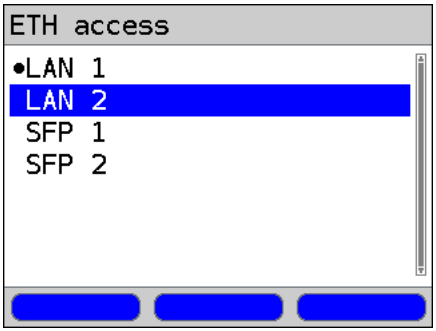


The Access mode:

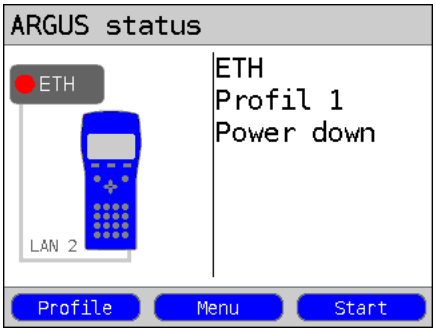
Using  Select a type of access; the selected type will be marked in blue (in the example, IP based).

The ARGUS will use the marked access mode (in this example, IP based). The ARGUS opens the Ethernet access types.

Continuation on next page, fig. 2

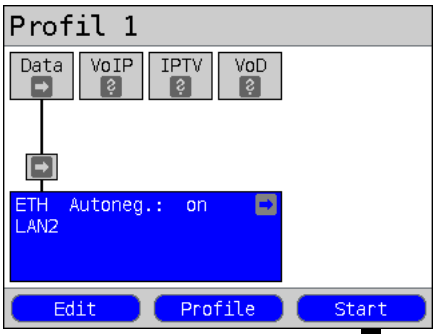


The ARGUS will use the marked Ethernet LAN2 access type. ARGUS opens the Status display.



ARGUS Status display

The ARGUS will use the default (preset) profile to set up the Ethernet connection (in this example, Profile 1) as well as the marked Ethernet jack (in this example LAN 2 jack).

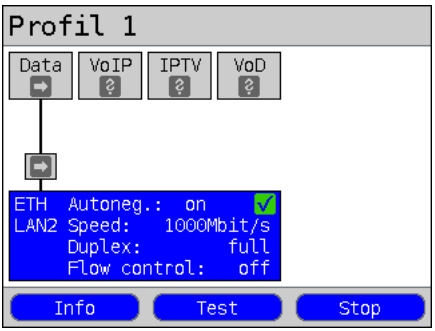


The meaning of the arrow in the Layer 1 box:

grey arrow	No test started
yellow arrow	Test started
green check mark	A connection has been setup.
<Edit>	Edit the Ethernet settings
<Profile>	Opens profile
<Start>	Sets up an Ethernet connection

Set up an Ethernet connection

Continuation on next page



Display:

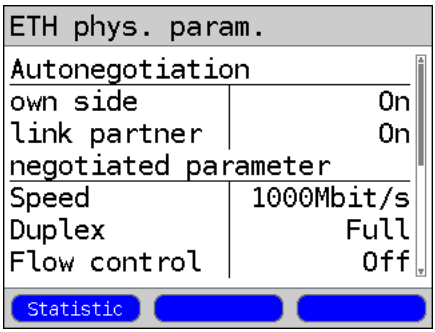
- current connection status

<Info> Displays the Ethernet connection parameters

<Test> Displays the tests possible

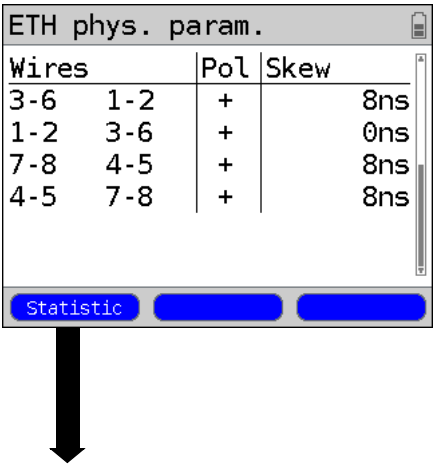
<Stop> Disables the Ethernet connection

or



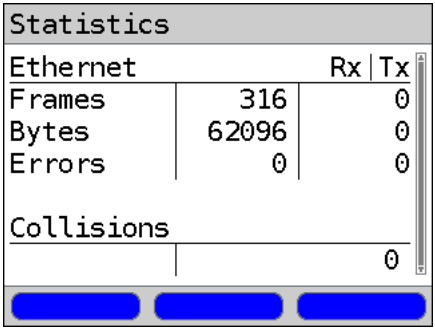
- Autonegotiation setting
- Autonegotiation on the remote end
- Negotiated speed
- Type of duplex mode
- Flow control setting

<Statistic> Opens Ethernet statistics



Display of the polarity and the skew between the wires:

- Wire assignment
- Polarity
- Skew in ns



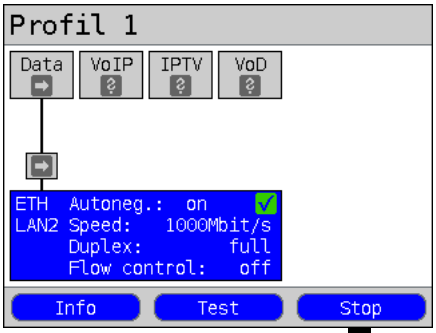
Statistics display:

- Ethernet frames received (Rx) and sent (Tx)
- Bytes received (Rx) and sent (Tx)
- Number of errors on the receiving (Rx) and sending (Tx) sides
- Number of collisions

Hotkey Assignment

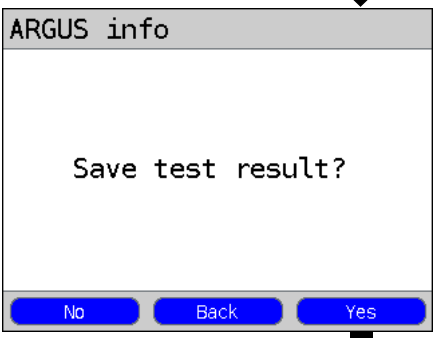
Hotkey	Service
Numeric key 0	ARGUS-Status
Numeric key 1	Help hotkeys
Numeric key 3	IP ping
Numeric key 4	Trace route
Numeric key 5	HTTP download
Numeric key 7	FTP download
Numeric key 8	Trace/remote
Numeric key 9	IPTV
	VoIP call
	Status display
One after the other  and 	Quick access to the access menu
One after the other  and 	Displays ARGUS-specific information, such as ARGUS type, SW version, Ser. No., own MAC addresses, SW options etc.
One after the other  and 	Restores the saved settings.
	The speed-dialling memory for numbers, settings (e.g. PPP user name, IP addresses etc.), profile / profile names, user-specific services, key-pad infos and all of the test results stored in the ARGUS may be deleted if the settings have not been saved before hand.
One after the other  and 	All settings will be reset to the default factory settings.

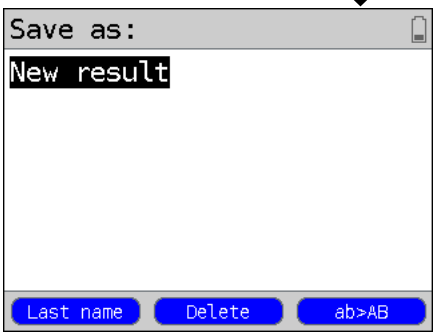
Clear down the Ethernet connection and save the results



Status screen

Clear down the Ethernet connection.



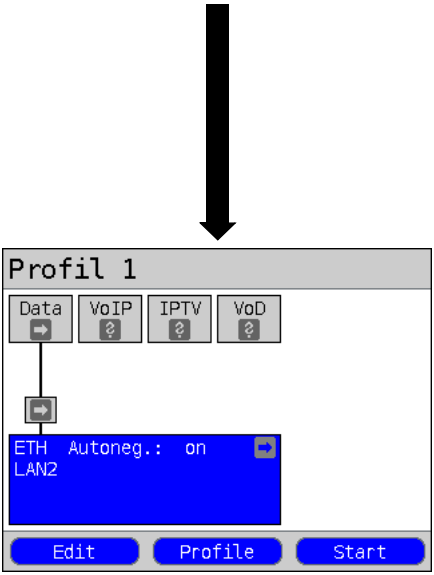


The ARGUS saves the Ethernet statistics together with the trace data in the first available memory location. The memory location can be given any name desired (see main manual).

If the memory is full, you must manually select a memory location to be overwritten.

Save result

Continuation on next page



Once the results have been successfully saved in memory, the ARGUS will return to the Status screen or ARGUS Status Display.
A new sync attempt can be started by pressing **<Start>**.

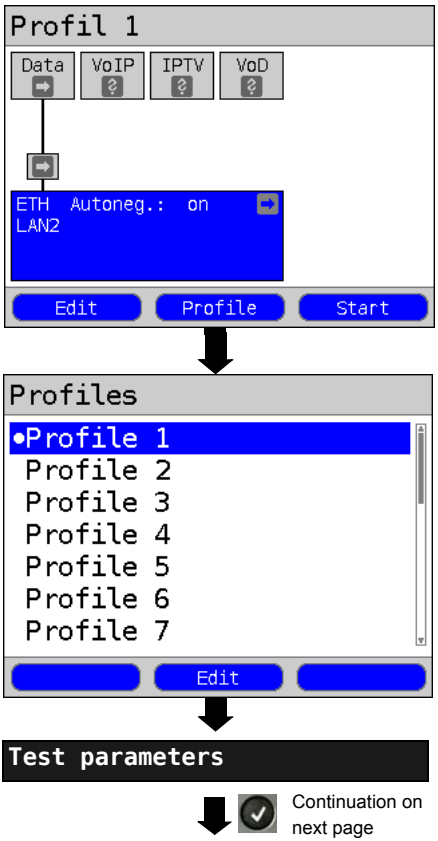
3 Loop (GigE)

This Loop will take all incoming Ethernet frames at Layer 1 (L1) and send them back to the sender unchanged.
In the case of a Loop on Layer 2 (L2) of the OSI model, the ARGUS swaps the source MAC address with the destination MAC address and then sends all the incoming Ethernet frames back.

Depending on the speed of the remote end, it is possible to Loop data rates up to 1 Gbit/s.

The following parameters are required for the Loop:

Protocol-independent parameters:



ARGUS - Status screen
In this example: Ethernet access

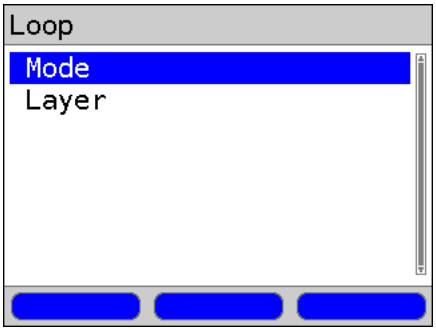
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet connection and the Loop.

The ARGUS will use the marked profile as the default profile and return to the Settings menu.

Continuation on next page



Select the test to be configured
(in this example, Loop).



Settings
- Mode
- Layer

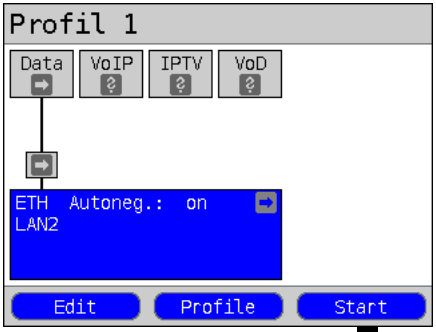
select and edit.

Quit the menu without saving the changes.

View and edit the marked parameters if necessary

Setting	Explanation
Test parameters:	
Loop:	
Mode	Use the Loop Mode to set what should be looped. - only those packets sent to own MAC (promiscuous mode off) L1: Only Loop packets sent to own MAC address and broadcast packets. L2: Only Loop those packets sent to own MAC address. Broadcasts will be discarded. - Loop all packets (promiscuous mode on) L1: All packets (including Broadcast packets) will be looped. L2: All packets - with the exception of Broadcast packets - will be looped. Broadcasts will be discarded. Default setting: ***only own MAC***
Layer	This setting determines the OSI Model layer that will be used for the Loop. - L1: In the case of Loop, all incoming Ethernet frames on Layer 1 (L1) will be sent back to the sender unchanged. - L2: In the case of Loop on Layer 2 (L2) of the OSI model, the ARGUS will swap the source MAC address with the destination MAC address and then send all incoming Ethernet frames back to the sender. Default setting: ***L2***

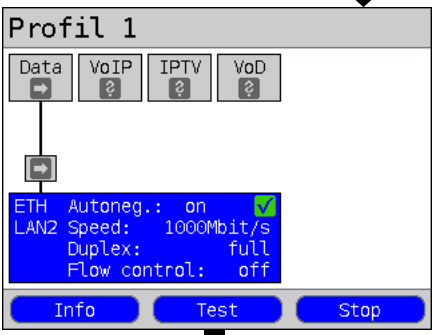
Start Loop (Access Mode: Ethernet)



Set up the Ethernet connection

The profile shown in the display (in this example, Profile 1) will be used for the Loop.

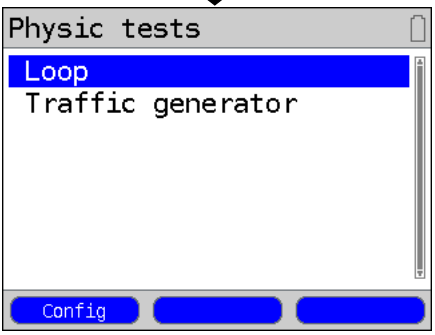
<Start> Activates Ethernet



<Info> Displays the Ethernet connection parameters

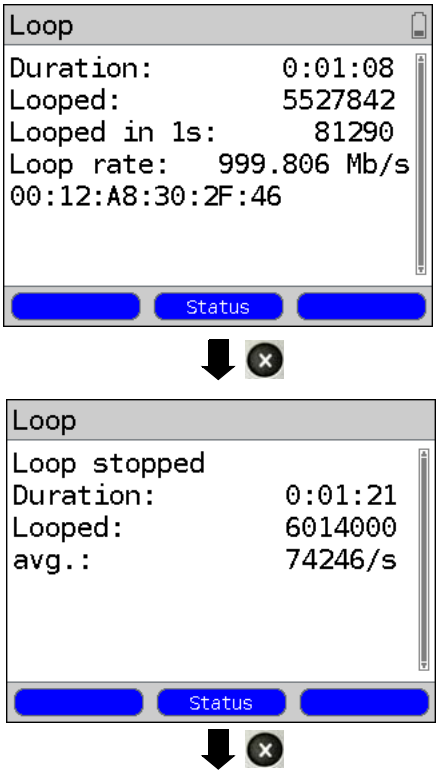
<Test> Displays the available tests

<Stop> Stops the Ethernet connection



<Config> Changes the Loop parameters

Continuation on next page



The Loop is started:

Duration	Current duration of the test.
Looped	Number of packets looped so far.
Looped in 1 sec.	Number of packets looped during the current second.
Through-put	Current data throughput per second.
MAC Address	Own MAC address of the looping device (e.g. to enter into the Traffic generator).
<Status>	Display the Status screen without stopping the test.

Duration	Total test time
Looped	Number of packets looped
Average	Number of packets looped per second
<Status>	Displays the Status screen.

Saving the results

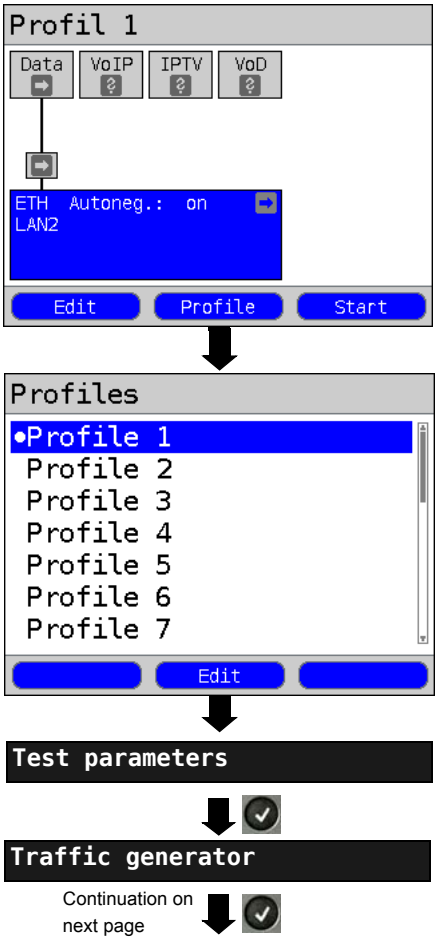
The results of the Loop test are saved in the same manner as for an Ethernet access, see page 14.

4 Traffic generator (GigE)

Use the ARGUS Traffic generator to check the capacity of Ethernet connections. When the ARGUS Traffic generator is used together with a Loop, this will help you to estimate the maximum possible throughput for this Ethernet connection.

The following parameters are required for the Traffic generator:

Protocol-independent parameters:

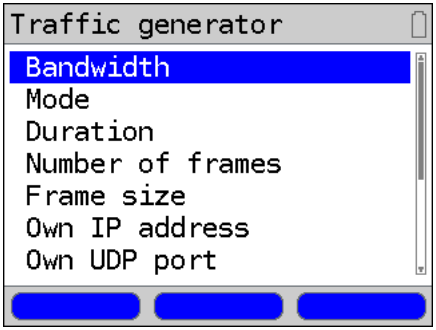


ARGUS - Status screen

Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet connection and the Traffic generator.

The ARGUS will use the marked profile as the default profile and return to the Settings menu.

Select the test to be configured (in this example, Traffic generator).



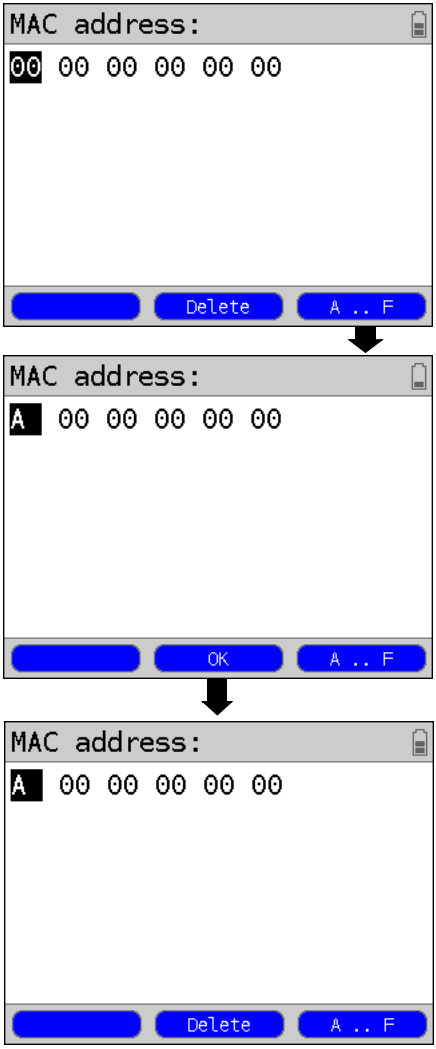
Settings select and edit.

Quit the menu without saving the changes.

View and edit the marked parameters if necessary

Setting	Explanation
Test parameters:	
Traffic generator:	
Bandwidth	Determine the bandwidth that the ARGUS will generate with the Traffic generator. Range: 1 kbit/s to 1000000 kbit/s. Default setting: ***10.000 kbit/s***
Mode	The following modes are for limiting the Traffic generation: Time, Frames and Endless. Default setting: ***Endless***
Duration	Determines the duration of the test. Range: 00:00:01 to 99:99:99 Default setting: ***00:00:01***
Number of frames	Determines the number of frames which are generated for the test. Range: 1 to 999999999 Default setting: ***50.000***
Frame size	Determines the frame size which is used. Range: 64 Bytes to 1518 Bytes. Default setting: ***1518 Bytes***
Own IP address	Enter the own IP address. Range: 0.0.0.0. to 255.255.255.255 Default setting: ***0.0.0.0***
Own UDP port	Enter the own UDP port. Range: Port number 0 to 65535 Default setting: ***Port number 7***

Destination MAC address	Enter the destination MAC address, the address of the remote end. Default setting: ***00 00 00 00 00 00***



ARGUS shows the last used or the stored MAC address.



Move the cursor within the line.

<Delete> Deletes the character in front of the cursor

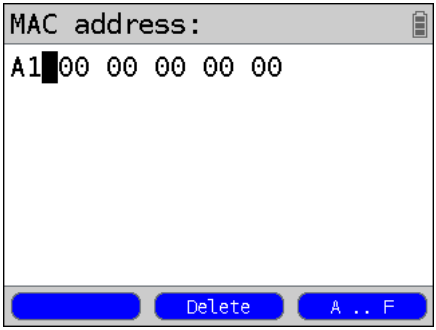
Enter the MAC address in hexadecimal from the keypad and the softkeys **<A..F>** (e.g. to enter a “C” press the softkey three times or for an “F” six times; conclude by pressing **<OK>** to confirm your entry). Group MAC addresses cannot be used.



Or when entering an MAC address, the key combinations can be used to enter the letters A to F.

Use the softkey on the right to shift the keypad (the softkey on the right assumes a different meaning when pressed).

In this example select „1“, see continuation on next page.





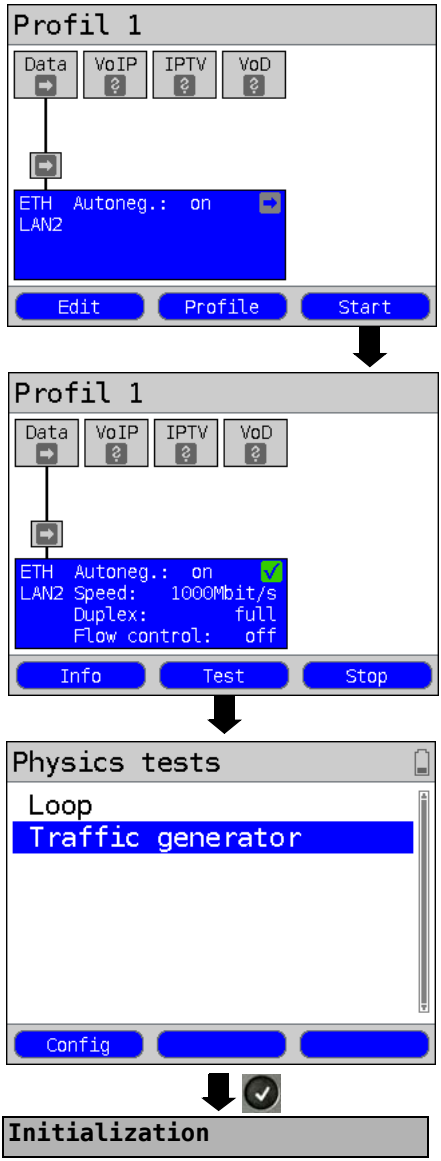
Move the cursor within the line.

<Delete> Delete the character in front of the cursor.

<A..F> Enter and select the characters A to F.

Destination IP address	Enter the destination IP address of the remote end. Range: 0.0.0.0 to 255.255.255.255 Voreinstellung: ***0.0.0.0***
Destination UDP port	Enter the destination UDP port, the port of the remote end. Range: Port number 0 to 65535 Default setting: ***Port number 7***
Follow-up time	Enter the follow-up time of the test. Range: 1 second to 10 seconds Default setting: ***3 seconds***
TTL	This sets the maximum number of hops that will be taken in the path to the destination node. Range: 0 Hops to 255 Hops Default setting: ***128 Hops***

Start Traffic generator



Set up the Ethernet connection

The profile shown in the display (in this example, Profile 1) will be used for the Traffic generator.

<Start> Activates Ethernet

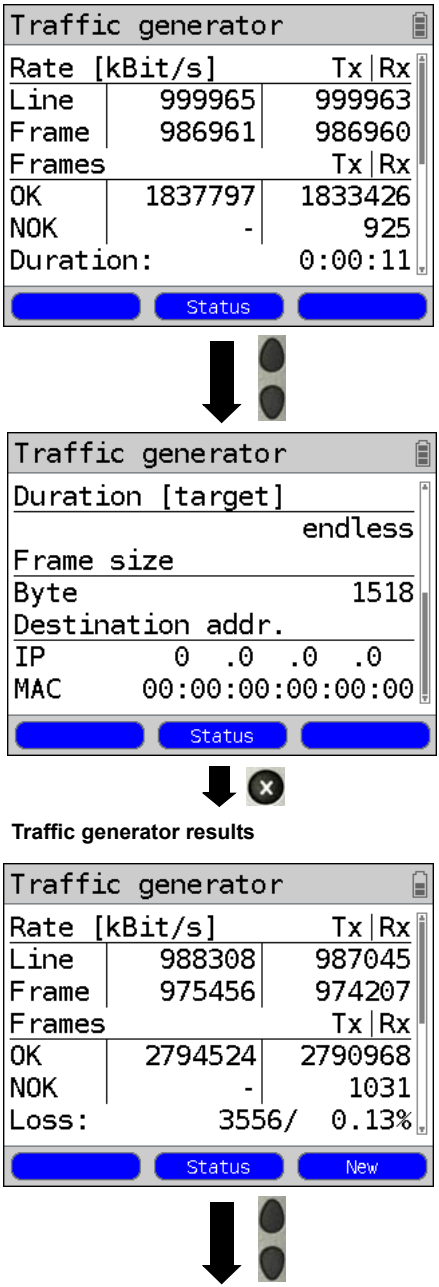
<Infos> Displays the Ethernet connection parameters

<Test> Displays the available tests

<Stopp> Stops the Ethernet connection

<Config> Changes the Traffic generator parameters, see page 21.

The Traffic generator starts automatically.



During the Traffic generation, it shows:

Data rates in kbit/s

- Current transmitted (Tx) and received (Rx) line rate
- Current transmitted (Tx) and received (Rx) frame rate

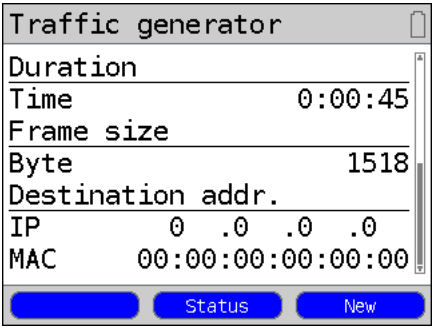
Frame statistics

- Current transmitted (Tx) and received (Rx) frames, which are OK
- Current transmitted (Tx) and received (Rx), which are not OK
- Duration of the Traffic generator
- Selected duration of the test (in the example endless)
- Selected frame size (in the example 1518 Byte)
- Destination IP and MAC address

Traffic generator results

Display of Traffic generator results:

- Average transmitted and received line and frame rates in kbit/s
- Average transmitted and received frames
- Display of the total and the percental loss of frames



- Duration of the Traffic generator
- Used frame size
- Used IP and MAC addresses

<Status>	Displays the Status screen without stopping the test
<Neu>	Starts a new test

Saving the results

The results of the Traffic generator test are saved in the same manner as for an Ethernet access, see page 14.

5 Appendix

A) Acronyms

	A
ADSL	Asymmetric Digital Subscriber Line
Avg	Average
	B
Bit/s	Bit per second
	D
Del.	Delete
	E
ETH	Ethernet
	F
FTP	File Transfer Protocol
FTTx	Collective term for different fiber connectivity technology
	G
G	Giga (10^9)
GigE	Gigabit-Ethernet
	H
h	hour
HTTP	Hypertext Transfer Protocol
	I
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
IPTV	Internet Protocol Television
ISO	International Standard Organization
ITU	International Telecommunication Union
	K
k	Kilo (10^3)
	L
L1	Layer 1 in the OSI reference model
L2	Layer 2 in the OSI reference model
L3	Layer 3 in the OSI reference model
LAN	Local Area Network
LED	Light-Emitting Diode
	M
MAC	Media Access Control
MB	Megabyte
M	Mega (10^6)
min.	Minute

	N
NLP	Normal Link Pulses
NOK	Not OK
ns	Nano seconds
	O
ONT	Optical Network Terminal
OSI	Open Systems Interconnection
	P
PC	Personal Computer
Phys.	Physical
PoE	Power over Ethernet
PPP	Point-to-Point Protocol
PPTP	Point-to-Point Tunneling Protocol
	R
RFC	Request for Comments
RJ	Registered Jack (standardized jack)
Rx	Received
	S
s	Second
SFP	Small Form-factor Pluggable
SHDSL	Single-Pair Highspeed Digital Subscriber Line
SW	Software
	T
TTL	Time to Live
Tx	Transceived
	U
UDP	User Datagram Protocol
	V
VDSL	Very High Speed Digital Subscriber Line
VL	Virtual Line
VoIP	Voice over IP
	x
xDSL	Collective term for different DSL variants

B) Software Licenses

The ARGUS firmware includes code from what are known as Open Source packages,which have been published under various licenses (GPL, LGPL, MIT, BSD, etc.). Additional information can be found - if requested in your order ¡V on the CD-ROM included in the package (see Software_License.htm) or can be viewed at http://www.argus.info/web/download/Software_License.
In the event that you are interested in the sources licensed under GPL or LGPL, please contact support@argus.info. A machine-readable copy of the source code can be obtained from intec Gesellschaft fur Informationstechnik mbH for a minimal fee - to cover the cost of physically copying the code. This offer is valid for 3 years.

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Version 1