

ARGUS 300

User manual

Version: 1.90 / EN

Important note:

The basic package contains at least one Gigabit Ethernet interface, which includes a variety of functions and tests. All other interfaces and functions are optional (see datasheet). Thus, depending on the scope of function supplied, individual menu options may be hidden.

© **by intec Gesellschaft für Informationstechnik mbH**
D-58507 Lüdenscheid, Germany, 12/2021

All rights, including translation rights, reserved. No part of this work may be reproduced, duplicated or disseminated in any form (print, photocopy, microfilm or any other method) without written consent.

All rights are reserved. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without intec's permission.

1	Introduction	6
2	Safety information	10
2.1	Safety and transport information for the battery pack	13
3	General technical data	17
4	Quick-start guide	20
5	Configuring accesses	28
5.1	Access wizard	30
5.2	Physical Parameters	33
5.3	Profile	33
5.4	Notes	34
6	Physical layer	35
7	Operation on G.fast and xDSL accesses	36
7.1	Configuring G.fast and xDSL interfaces	37
7.2	G.fast and xDSL settings	37
7.3	The ARGUS in access mode xTU-R	39
7.4	The ARGUS in access mode xTU-R bridge	59
7.5	The ARGUS in access mode xTU-R router	61
7.6	The ARGUS in access mode STU-C	63
8	Operation on the Ethernet access	64
8.1	Configuring Ethernet accesses	65
8.2	Ethernet configuration	66
8.3	Establishing an Ethernet connection	67
9	Virtual lines (VL)	69
9.1	Virtual lines in the status screen	69
9.2	Virtual line profiles (VL profiles)	72
9.3	Virtual line activation	73
	9.3.1 Starting a service	73
	9.3.2 Assigning additional virtual lines	74
9.4	PPP wizard	78
9.5	Virtual line settings	79
9.6	Displaying protocol statistics	80
10	Services + tests	83
10.1	Displaying service statistics	84

11	IP tests	85
11.1	IP ping	85
11.2	Traceroute	93
11.3	Path MTU test	96
11.4	iperf Client	98
11.5	iperf Server	101
11.6	ARGUS® Real Speed	103
11.7	HTTP download	105
11.8	FTP download	110
11.9	FTP upload	113
11.10	FTP server	116
11.11	Web browser	119
12	VoIP tests	121
12.1	Starting VoIP telephony	125
	12.1.1 VoIP back-to-back	132
12.2	VoIP Call Acceptance	133
12.3	VoIP call generator	136
13	IPTV tests	138
13.1	IPTV	138
	13.1.1 Multiple virtual lines	141
13.2	IPTV Zapping Test	146
13.3	IPTV Monitor	151
14	Parallel tests	155
15	Fiber	160
15.1	Optical Power Meter	160
15.2	Optical Fault Finder	162
15.3	Fiber Inspection Tool	164
16	Operation on a POTS access	166
16.1	Setting the POTS Interface	166
16.2	Connection on a POTS access	167
17	Operation on an ISDN Access	169
17.1	Setting the ISDN Interface and Access Mode	169
17.2	Initialization phase followed by a B channel Test	170
17.3	Service check	171
18	Operation on a PRI Access	173
18.1	Configuring the PRI Interface and Access Mode Settings	173
18.2	Initialization Phase including B-Channel Test	174
18.3	The L1 Status of a PRI Access	175

19	Test results	176
19.1	Saving test results	177
19.2	Sending test results to PC	177
20	WLAN	178
20.1	Switching on WLAN	178
20.2	Test results via WLAN	179
20.3	WLAN in router mode	180
21	ARGUS settings	181
21.1	Cloud services	181
	21.1.1 Cloud update	183
	21.1.2 Automatic configuration import	185
	21.1.3 Upload measurement logs	187
21.2	Remote access	188
21.3	Device settings	189
21.4	Backing up and restoring settings	191
	21.4.1 Backup/restore	191
	21.4.2 Restoring the factory settings	192
22	Update via PC	193
23	Using the battery pack	197
24	ARGUSpedia	200
25	Appendix	203
A)	Hotkeys	203
B)	Symbols	206
C)	VoIP-SIP status codes	209
D)	Vendor identification numbers	211
E)	Software licenses	212
F)	Abbreviations	213
G)	Index	223

1 Introduction

ARGUS 300: the universal broadband tester

The new ARGUS 300 all-in-one tester delivers improved performance for testing broadband interfaces. The high-quality multifunction tester is ideally equipped for the expansion of future networks.

Modern design and new housing concept

Its robust design combines the requirements for a compact hand-held meter in daily field use with the performance of a high-end tester. The ARGUS tester with touch-screen display enables intuitive navigation of the familiar ARGUS menu structure. Thanks to the use of numerous graphical elements, the redesigned GUI makes this sophisticated multifunction tester as easy to use as a smartphone. A new, innovative internal help function supports rapid, reliable interpretation of test results.

All necessary broadband interfaces

The ARGUS 300 reliably tests all broadband interfaces, e.g. GPON, FTTx (PtP) and G.fast (106 + 212 MHz), super vectoring, bonding, ADSL, VDSL and SHDSL accesses, in the uncompromising quality you have come to expect. It is also equipped with a wide range of further interfaces and test functions, such as 2.5 GB Ethernet, WLAN, Copper, TDR, RFL, triple Play and many more. An extremely high-performance hardware is planned specifically for tests in the Gigabit Ethernet range (up to 10 GigE).

Additional features

The integrated WIFI interface enables the ARGUS 300 to communicate with its environment directly – a PC link is no longer required.

Once integrated in your job management system, the ARGUS 300 marks the advent of a new generation of broadband testing.

Overview of key ARGUS functions:**Ethernet interfaces**

- Ethernet tests with up to 10 Gbit/s (loop, traffic generator, RFC2544, Y.1564)
- 10/100/1000 Base-T
- LAN1 additionally with 2.5 GBase-T (2.5GbE), 2500 BASE-T (IEEE 802.3bz, NBase-T)
- LAN2 additionally with 5/10 GBASE-T (5/10 GbE), 5000/10000 BASE-T, (MGBASE-T) (IEEE 802.3ak, IEEE 802.3an)
- SFP1: full SFP interface (FTTx, PtP)
 - 100 Base-FX/LX (IEEE 802.3 Clause 26/58)
 - 1000 Base-BX/LX/SX/ZX Active Ethernet (IEEE 802.3 Clause 38 bzw. 802.3z)
 - 2.5 GBase-X (2.5GigE/2.5GbE)
- SFP2: full SFP+ interface (FTTx, PtP)
 - 10 GBASE-X (10GbE/10GE), 10000 BASE-X (IEEE 802.3ae)

Fiber interfaces

- ARGUS Optical Power Meter (via SFP)
- Fiber Inspection Tool (via USB)
- Optical Time Domain Reflectometer (OTDR)
- Optical Fault Finder (via SFP)
- GPON and PON Installation Test

WLAN interface

- WLAN Access Point Mode
- WLAN AP Scan
- WLAN Client
- WLAN Spectrum Analysis
- WLAN Management

G.fast and xDSL interfaces (ADSL, ADSL2, ADSL2+, VDSL2, VDSL2 profile 35b, SHDSL, G.fast)

- Synchronisation with DSLAM (xTU-C) and determination of all relevant connection parameters and error counters
- Bridge, router and terminal-device modes, via IPv4 and IPv6
- SHDSL-DSLAM simulation (STU-C)

IP tests via Ethernet, GPON, FTTH, xDSL and WLAN

- IP tests

- Ping and traceroute tests (BRAS information, PPP trace, VLAN), via IPv4 and IPv6
- Download tests for determining throughput rate (HTTP download, FTP up/download)
- Speed test via iperf, Speedtest by Ookla, ARGUS Real Speed according to RFC 6349
- FTP server test, up/download from ARGUS to ARGUS
- Concurrent testing of multiple services (VoIP, IPTV, data)

- VoIP tests

- VoIP terminal device simulation, including acoustics (var. codecs), via IPv4 and IPv6
- OK/FAIL assessment of VoIP speech quality (QoS) according to:
 - MOS_{CQE} (ITU-T P.800), E-model (ITU-T G.107)

- IPTV tests

- Stream request (STB mode), IPTV channel scan, IPTV passive
- OK/FAIL assessment and display of quality parameters
- Moving picture mode with live picture

ISDN functions

- BRI S/T interface according to ITU-T I.430 in TE mode
- PRI/E1 interface according to ITU-T I.431 and ITU-T G.703 in TE mode

POTS functions

- Fully functional integrated analogue handset (POTS)
- With DTMF and CLIP display, pulse dialling
- High-ohm 2-wire monitor with voltage measurement

Documentation and analysis

- **Documentation** of data through automatic access tests in access acceptance logs, in device and on PC in HTML format.
- Transmission of results to smart phone using **QR code**.
- Free firmware updates via the **cloud** or using the **update tool**.
- **WLAN extension** for transferring measurements to systems for electronic job processing, access point mode (browsers, download) or remote control using smart phones.



Note:

You can download the latest manuals at <http://www.argus.info/service/downloads>
or simply contact one of our service representatives:

intec Gesellschaft für Informationstechnik mbH
Rahmedestr. 90
D-58507 Lüdenscheid
Tel.: +49 (0) 2351 / 9070-0
Fax: +49 (0) 2351 / 9070-70
www.argus.info/en
support@argus.info

2 Safety information

The ARGUS may only be operated using the accessories supplied with the device. The use of other accessories can result in faulty measurements or even damage to ARGUS and the connected equipment. Only use the ARGUS according to the instructions contained in this accompanying document. Use in any other manner can cause harm to persons or destroy your ARGUS.



- Before connecting your ARGUS to a local access, ensure that no hazardous voltages/currents, or voltages/currents for which the ARGUS or its accessories are not designed, are present. Also keep in mind that the voltage can change over the time that the device is connected.
- Use the ARGUS only according to its intended purpose (standard) at all interfaces and accesses.
- Voltages over 50 V AC and 120 V DC can cause death.
- Never conduct measurements without the battery pack!
- The ARGUS is not waterproof. Therefore, protect the ARGUS against water penetration.
- Before replacing the battery pack, remove the power supply and all measuring leads and switch off your ARGUS instrument.
ATTENTION: Never remove the battery pack during operation.
- Remove the power adapter from the mains socket as soon as the ARGUS is switched off or no longer in use (e.g. after charging the battery pack)!
- The ARGUS may only be used by trained personnel.
- The ARGUS may only be operated using the power adapter supplied with the device.
- Only manufacturer-approved USB devices without mains connection may be connected to the USB host interfaces (USB-A). The instrument can be connected to a PC as a mass storage device.
- If external USB devices are used on the USB-host interface (USB-A), no warranty is assumed for occurrences outside the mechanical wear of normal plug-in.
- Only use the SFP slots for SFP types explicitly approved by intec GmbH. Never insert other objects or SFP modules into the SFP slots.
- When the SFP slots are not in use, always make sure that they are sealed using the supplied protective covers.
- When using the SFP slots and SFP modules, always be sure to observe normal cleanliness.
- When using SFP modules, always be sure to observe the module manufacturer's safety information and use them only for their intended purpose.



- The SFP modules typically approved for ARGUS are generally class 1 laser devices.

Normally, the use of class-1 laser products does not require any special protection measures.

However, for your own safety please note the following:

- Always cover the ends of the optical fibres and the SFP module when the connection is interrupted.
- Always avoid direct eye contact with the emitted laser light. Vision aids and long exposure times can make even low light doses extremely dangerous.
- The equipment may only be used by trained personnel.
- The electromagnetic compatibility (EMC) was tested according to the regulations specified in our declaration of conformity.
Your ARGUS instrument is a class A device, and can cause radio interference in residential areas. In this case, the user may be required to implement appropriate measures.
- The active charging of the battery pack (charging the battery) and automatic charging (on by default) may only be carried out in a temperature range of 0 °C to +40 °C.
- The device may not be used during thunderstorms.
- If the ARGUS is operated under extreme conditions, it can be set to energy-saving mode to protect the device and the user; this can interrupt the running test and drop the connection.

To ensure dependable extended operation of the ARGUS, always make sure that it is optimally protected against high temperatures.

- The device may not be opened.
- Please observe the following safety and transport information when using the lithium-ion battery pack.
- Before starting a test or synchronising on an interface, determine how you want to supply power to the ARGUS (battery pack or power adapter).
The car adapter is only intended for charging the device. When the ARGUS is connected to this adapter, you should not run any tests or synchronise on a DSL interface.
- The ARGUS contains extremely sensitive electronic components. Depending on the operating mode selected, an electronic discharge from the user can, in rare cases, result in impairment of device function. The user may need to restart the impaired test or function.

Return and environmentally compatible disposal

Current environmental law restricts the use of certain hazardous substances in electrical and electronic devices, in particular the concentration or use of lead (Pb), cadmium (Cd), mercury (Hg), hexavalent chromium [Cr(VI)], polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE).

We hereby confirm that, according to the assurances, marking and documentation of our suppliers, ARGUS brand measuring products do not contain any substances in concentrations, compounds or applications whose marketing is prohibited according to the valid provisions of the RoHS Directive 2011/65/EU of the European Parliament and Council dated 8 June 2011.

Our registration number issued by the EAR is: WEEE REG. no. DE 92829367.

Since October 2005, we have been marking all our measuring devices with this symbol, in compliance with WEEE 2002/96/EC and the corresponding German statute ElektroG:



() (DIN EN 50419).

In other words, the ARGUS and its accessories may not be disposed of as household waste. Please consult with our Service department with respect to the return of old devices.

2.1 Safety and transport information for the battery pack

Transport

The battery pack has been tested according to the UN directive (ST/SG/AC.10/11/Rev. 4, part III., subchapter 38.3). Protective functions have been implemented to guard against short-circuit, destruction and dangerous reverse currents. The quantity of lithium contained in the battery pack is below current thresholds, and thus not subject to international regulations governing hazardous materials either as an individual part or mounted in the ARGUS. When transporting multiple battery packs, however, you may also need to observe these regulations. Further information is available on request.



Failure to observe the following danger and warning information can impair the protective functions of the battery pack. This can cause extremely high voltages and currents which can in turn result in abnormal chemical reactions, acid leaks, overheating, smoke, explosion and/or fire. Additionally, failure to observe this information can negatively impact both the performance capacity and the performance duration.

Hazard information and warnings

1. Do not disassemble or short-circuit the battery pack.
2. Do not throw the battery pack into fire or overheat it (> 60 °C).
3. The battery pack must not become wet or damp.
4. Active charging of the battery pack and automatic charging (on by default) may only be carried out in a temperature range of 0 °C to +40 °C.
5. To maximise battery life, do not store the battery long-term at temperatures above +50 °C.
6. The battery pack may only be charged using the corresponding ARGUS device.
7. Do not puncture the battery pack with a sharp object.
8. Do not throw the battery pack or expose it to shocks.
9. Do not use battery packs that have become damaged or deformed.
10. The battery pack contacts have a specific polarity (positive and negative); do not insert them in the ARGUS with reverse polarity.
11. Only connect the battery pack to the corresponding ARGUS in the intended manner.
12. The battery pack may not be directly connected to electrical outputs such as power adapters, car adapters etc.
13. Only use the battery pack with ARGUS.
14. Do not attach, transport or store the battery pack together with metallic objects.
15. Do not expose the battery pack to electrostatic charges.
16. The battery pack may not be charged or discharged together with primary batteries or other battery packs.

2 Safety information

17. If the battery pack fails to charge by the end of the charging time, it can no longer be recharged.
18. Do not expose the battery pack to excessive pressure.
19. If the battery pack emits odours or heat, becomes discoloured or deformed or otherwise appears different from normal during operation, charging or storage, immediately remove the battery pack from the device and never use it again.
20. 20. In the event that acid leaks and comes in contact with eyes or skin, wash immediately with clean water. Do not rub. In both cases, seek medical attention immediately. Otherwise, permanent injury may occur.
21. Keep the battery pack away from children.
22. Read this manual and the corresponding safety information carefully before using the battery pack.
23. If odours, rust or other abnormalities are detected before the first use, contact intec GmbH to clarify the next steps.

Further details

Battery compartment

The battery pack compartment is on the rear of the device. Generally, you do not need to replace the battery pack.

If this should become necessary, unscrew the two screws of the battery compartment cover and remove the cover. The battery pack inside the compartment can easily be detached from the plug connector and removed. The plug is reverse polarity protected, so that you can insert a new battery pack with no difficulties.

Use only the battery pack supplied with the device.

First-time operation

Connect the switched-off ARGUS to the supplied plug-in power supply. The ARGUS will automatically switch on when the power supply is plugged in. After pressing the  key, select the option "Battery (status, charging)". The option "Status" displays further information, such as voltage and current level.

The Accesses display can vary depending on the configuration. You must first change the battery pack supplied with the device completely before full capacity is reached.

Automatic charging

Select this option to toggle the automatic charging functionality on or off. You can also do this in the ARGUS Manager, which you can access by swiping down or pressing the power key. Here, automatic charging can be toggled on and off. The ARGUS charges the battery automatically in the background when the power adapter is connected as soon as the battery status falls below a threshold value (battery symbol in display). When the ARGUS is disconnected from the power adapter before that battery is completely charged, the ARGUS does not automatically continue charging when it is subsequently reconnected because the charge is no longer below the threshold.

Power-saving mode

In battery mode, the ARGUS automatically switches off after five minutes of no activity (interval adjustable). The ARGUS does not switch off during a test (e.g. loop) or in trace mode. The device can alternatively be operated using the supplied external adapter. When the adapter is connected, power supply via the battery is automatically switched off. The ARGUS must always be operated with the battery, regardless of the power supply. This ensures e.g. uninterrupted operation of the real-time clock. Remove the power adapter from the mains socket as soon as the ARGUS is switched off or no longer in use (e.g. after charging the battery pack)!

Handling the battery pack

Power down the ARGUS and disconnect the power adapter. Then unscrew the screws holding the battery compartment cover. The battery pack inside the compartment can easily be detached from the plug connector and removed. The plug is reverse polarity protected, so that you can insert a new battery pack with no difficulties.

Use only the battery pack supplied with the device.

Attaching any other power supply to the device contacts will damage your ARGUS instrument.

- Only charge the supplied battery pack in the ARGUS.
- Do not use the ARGUS battery pack in other devices.
- Active charging of the battery pack and automatic charging (on by default) may only be carried out in a temperature range of 0 °C to +40 °C.
- The lithium ion battery pack should be stored with a charge of 40 to 60 %. When storing the device for longer periods, you should refresh this charge level every six months. To prevent full discharge, remove the battery pack from the device for long-term storage. To maximise battery life, do not store the battery long-term at temperatures above +50 °C.

Battery indicator

The ARGUS indicates the current state of the battery graphically in the display when no power adapter is connected. A battery symbol flashes in the display when it is down to a power reserve of approx. 8 minutes (depending on the operating mode). Tone errors, and in extreme cases malfunctions, can occur in this period. Connect the power adapter. The ARGUS can recharge the battery completely when the power adapter is connected. The ARGUS power pack does not require manual discharge. A complete charging process can take up to approx. 6 hours.

3 General technical data

Device specifications:

Dimensions/weight	Inputs/outputs
Height: 300 mm	- 1x RJ-45 und 1x RJ-11 (Line) for xDSL, G.fast, BRI S/T and U/R/C
Width: 128 mm	- 1x RJ-45 for SHDSL
Depth: 94 mm	- 1x RJ-45 for PRI
Weight: < 2 kg (4.41 lbs)	- 2x Ethernet: 1x 10/100/1000/2500 base-T and 1x RJ-45 Test port (LAN cabling)
(incl. battery pack)	- 1x RJ-45/Ethernet 10000 base-T/10 GigE
	- 2x SFP ports: 1x 100 base-FX/LX, 1000 base-SX/LX/ZX/BX and 1x SFP+ for 10 GBase-T
	- 1x SC/APC for OTDR
	- 5 x 4 mm banana sockets, contact-protected for cable multimeter (DMM)
	- 1x USB client interfaces, type micro B, for accessing USB mass storage
	- 2X USB host interfaces, type A, for external devices
	- WLAN IEEE802.11a/b/g/n
	- 1x 12V DC socket
Control panel	
28 keys	
4 softkeys	
4 cursor keys	
Touch display	
Display	Temperature range
TFT colour display, Touchscreen, illuminated 800 x 400 Pixel	Temperature range for charging battery pack: 0 °C (+32 °F) to +40 °C (+104 °F)
	Max. Operating temperature (endurance tests): 0 °C (+32 °F) to +40 °C (+104 °F)
	Max. Operating temperature (battery mode): 0 °C (+32 °F) to +40 °C (+104 °F)
	Operating temperature (with power/car adapter): 0 °C (+32 °F) to +40 °C (+104 °F)
	Storage temperature: -20 °C (-4 °F) up to +60 °C (+140 °F)
	Humidity: up to 95 % rel. humidity, non-condensing

Power supply

Lithium ion battery pack with 7.2 V rated voltage (always observe the safety instructions!)
or 12 V/1.5 A ARGUS power adapter

Miscellaneous

ARGUS user safety tested according to EN62368-1, RoHS conformity according to the WEEE Directive.

The electromagnetic compatibility (EMC) was tested according to the regulations specified in our declaration of conformity.

CE mark



The ARGUS 300 fulfils the EC directives for the CE mark.

We will be happy to provide a detailed declaration of conformity on request.

Supported Standards:

GPON (SFP): ITU-T G.984 PON Installation Test	OTDR: SC/APC (8°) IEC 61754-4
Fiber Inspection (USB-A): IEC 61300-3-35	WLAN: IEEE 802.11a/b/g/n
VDSL (line): ITU-T G.993.2 (VDSL2) ITU-T G.993.5, G.vector (vectoring) ITU-T G.998.2, G.bond (bonding) ITU-T G.993.2, Annex Q (super vectoring) Profiles: 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a, 35b ITU-T G.998.4 (G.INP, retransmission)	Ethernet (LAN/SFP): IEEE 802.3 - 10 base-T - 100 base-T - 1000 base-T - 10 Gbase-T - SFP (MSA) Autonegotiation auto-MDI(X)
ADSL (line): ITU-T G.992.1, Annex A (ADSL) ITU-T G.992.2, Annex A (G.lite) ITU-T G.992.3, Annex A (ADSL2) ITU-T G.992.5, Annex A (ADSL2+) ITU-T G.992.1, Annex B (ADSL) ITU-T G.992.5, Annex B (ADSL2+) ITU-T G.992.5, Annex J (ADSL2+) ITU-T G.992.3, Annex L (RE-ADSL2 via analogue) ITU-T G.992.3, Annex L (RE-narrow PSD ADSL2 via analogue) ITU-T G.992.3, Annex M (ADSL2) ITU-T G.992.5, Annex M (ADSL2+)	SHDSL (line): ITU-T G.991.2, Annex A (G.SHDSL) ITU-T G.991.2, Annex B (G.SHDSL) ITU-T G.991.2, Annex F (G.SHDSL.bis) ITU-T G.991.2, Annex G (G.SHDSL.bis) ETSI TS 101 524 V 1.2.1 (ETSI SDSL) ETSI TS 101 524 V 1.2.2 (E.SDSL.bis) IEEE 802.3.ah (EFM) ITU-T G.994.1 (G.hs)
G.fast (line): ITU-T G.9700/9701 (profile 106a) ITU-T G.9700/9701 (profile 212a)	 Dielectric strength: Line: DC: max. +200 V AC: max. +100 V _{pp} (copper tests only) DC: max. +200 V (xDSL) Banana sockets: DC: max. +200 V AC: max. +200 V
ISDN (BRI/PRI/E1): ITU-T I.430 ITU-T I.431 ITU-T G.703	

4 Quick-start guide



Power key



- Switches on the ARGUS
- Restart after power down
- Switches on display illumination (also possible with any other key). In battery mode, the display illumination switches off automatically after an interval that can be set in ARGUS
- Opens the ARGUS Manager from any point in the menu (press briefly). Return from the ARGUS Manager to the original menu.
- Switches off the ARGUS (key must be held down): after an adjustable interval (e.g. after 10 minutes), the ARGUS automatically shuts down in battery mode (see page 197).
- Emergency switch off if pressed for more than 10 seconds

Enter key



- Opens menu
- Switches to next display
- Starts/opens test
- Accepts setting

Back key

- Switches the ARGUS back to the previous display without saving current entries, e.g. changes in a configuration parameter
- Exits graphic displays
- After power-up: opens the main menu

Cursor keys

- Browse display lines page by page (vertical cursor keys) Cursor movement within a display line (horizontal cursor keys)
- In the lists of options or statistics, you can use the horizontal cursor keys to browse by pages
- Select a menu, a function or a test
- Define lead types for TDR
- Move display cursor in graphic displays
- Select functions in graphic status screen

Telephony**Analogue**

- Answers and hangs up

G.fast, xDSL (access mode xTU-R, xTU-R router), WLAN, GPON and Ethernet

- Starts VoIP telephony
- Accepts an incoming VoIP call

Level key

- G.fast and xDSL accesses: displays results
- Ethernet: opens results
- Start/stop function for realtime analyses (line scope/TDR)

Number pad

- Entry of numerals 0 through 9, letters and special characters
- Direct function call, depending on the selected access (hot key), e.g. page 204

Softkeys



- The function of the four softkeys depends on the respective situation. The currently assigned function appears in the bottom line of the display in the form of four touch areas, e.g.:
<Access> Opens the menu for selecting various accesses
<Start>: establishes a connection or starts a test

Wheel key



- Opens the setup menu

Menu key



- Opens the quick menu

The ARGUS can be controlled using the four cursor keys, the Enter key , the Back key , the level key  and the four softkeys. The bottom line of the display shows the current assignments of the four softkeys. In the following pages of this manual, only the respective currently valid softkey function is displayed in angle brackets < >, e.g. <Access>. The softkey  has the same function as the Enter key .

The ARGUS 300 can also be operated using the touchscreen. You can access the next menu and enter and confirm settings by tapping the corresponding screen location. The softkeys displayed at the bottom can also be actuated using the touchscreen. Additionally, you can scroll up and down by swiping and zoom in and out in graphics with two fingers.

Top connections



PWR

For external power adapter.

When the external power adapter is connected,
The ARGUS switches off the battery power supply.

USB-A or USB-A 1/2

USB host interface
(WLAN)



The ARGUS regularly checks
whether USB devices are connected.

USB-B (micro USB)

USB client interface (PC connection)

a1/2 or b1/2

4 mm banana socket for copper tests

GND

4 mm banana socket for copper tests (ground
reference)



Further variants of the connector panel in the header area, e.g. with OTDR (SC/APC) or Gigabit Ethernet extension (LAN2, LAN3, SFP2), are explained in the corresponding manual or manual chapter.

Bottom connections

Yellow LED “Link/data” signals physical connection with another Ethernet port

- LED steadily illuminated: connecting
- Flashing LED: transmitting/receiving



Green LED “Speed” and yellow LED “Link/Data” signal Transmission speed

- LED on: 10/100 base-T
- Green Speed LED indicates transmission speed
- -LED on: 10/100/1000 base-T

PRI/E1

Access PRI/E1 Pin assignment: 1/2, 4/5

Line

The instrument is equipped with two line sockets: one RJ11 plugs and one for RJ45 plugs

Analogue/BRI S/T

access Pin assignment: 4/5

G.fast access Pin assignment: 4/5

xDSL access Pin assignment: 4/5

Copper access Pin assignment: 4/5

SHDSL

Access Pin assignment: fixed 4/5,
SHDSL n-wire variable 3/6, 1/2, 7/8

LAN1

Connection to a PC network card. Connection to the Ethernet interface of an xDSL modem, router (IAD) or hub/switch or another Ethernet interface (access: Ethernet).

SFP1

Connection of selected SFP modules from various manufacturers, for accessing fibre-based interfaces (Ethernet, FTTx/GPON).

LEDs

The LEDs next to the touch display indicate the following:



Power

Lights up green when the device is switched on.

Charge

A flashing green LED indicates that the device is charging.

Alarm

Visualizes configured alarms (e.g. DSL).

Test

This LED flashes green when a test, e.g. data, is started.

The LED is continuously green when a connection is established.

Protocol 1

This LED flashes green when a test, e.g. data, is started.

The LED is continuously green when a connection is established. If the connection could not be established, the LED is continuously red.

Sync 1

The LED flashes green while connecting.

The LED is continuously green when the connection is established.

Protocol 2

As Protocol 1, only second line, e.g. for bonding connections.

Sync 2

As Sync 1, only second line, e.g. for bonding connections.

Charging the battery in initial operation

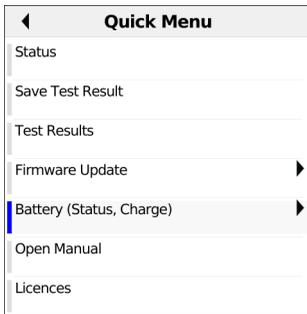
The battery pack compartment is on the rear of the device. Attach the battery back by placing it against the retaining points at the top end and then screwing down the screws. Use only the battery pack supplied with the device. Observe the safety information given on page 13. Now connect your (switched-off) ARGUS to the external power supply supplied with the device.

The ARGUS switches on automatically. The following display appears (you may first need to acknowledge warnings or messages with <Continue>):

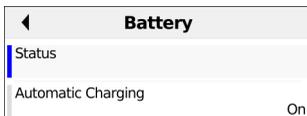


The Accesses display can vary depending on the configuration.

Current assignment of the softkeys



Battery Status	
State	Charging
Remaining Capacity	90 %
Power Supply Plugged In	Yes
Actual Voltage	7994 mV
Actual Current	1754 mA
Average Current	-579 mA
Temperature	21,5 °C
Device should be turned off	No
Learning actual battery capacity	No

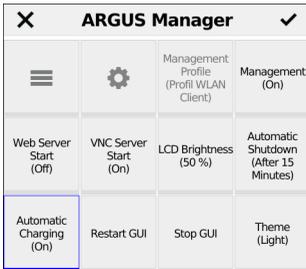


After pressing the Menu key, select the option “Battery (Status, Charge)” (see image above left). Selecting “Status” (see image below left) displays further information, such as voltage and current level (see image at right).



Select “Automatic charging” to toggle the automatic charging functionality on or off.

You can also do this in the ARGUS Manager, which you can access by pressing the power key or swiping from top to bottom. Here, touch to toggle automatic charging on and off.



You must first change the battery pack supplied with the device (see page 197, “Using the battery pack”) completely before full capacity is reached.

Power-saving mode



In battery mode, the ARGUS automatically switches off after five minutes of no activity (interval adjustable). The ARGUS does not switch off during a test (e.g. loop box) or in trace mode.

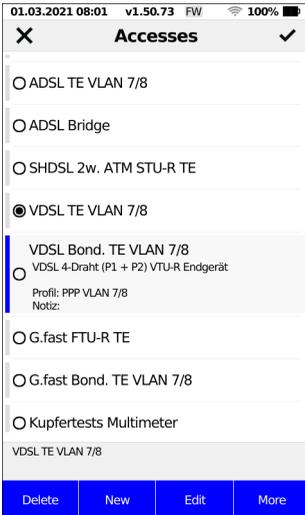
The device can alternatively be operated using the supplied external adapter. When the adapter is connected, power supply via the battery is automatically switched off.

The ARGUS must always be operated with the battery, regardless of the power supply. This ensures e.g. uninterrupted operation of the real-time clock.



Remove the power adapter from the mains socket as soon as the ARGUS is switched off or no longer in use (e.g. after charging the battery pack)!

5 Configuring accesses



If an access was selected the last time the instrument was used, the ARGUS starts in the Access menu.

After selecting `<Access>`, the ARGUS displays all configured accesses (up to 100 in all). The accesses most commonly used in Germany are preconfigured by default. When changing accesses, the last access used is indicated on the display with ● . You can select a different access using the cursor keys or the touchscreen. The selected access is marked with a vertical blue line on the left side. Press to confirm your access selection.

The marked accesses also provide a preview of the selected access settings.

In the example shown here, the access VDSL TE VLAN 7/8 is selected. The access VDSL Bond. TE VLAN 7/8 is highlighted, and a preview of the access settings is displayed.

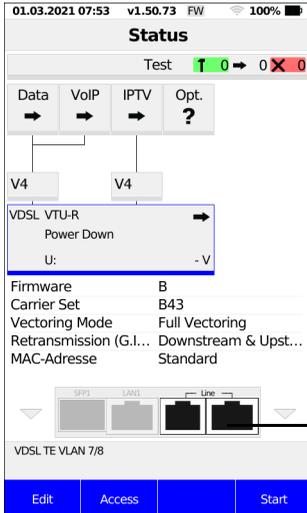


The access VDSL TE VLAN 7/8 is highlighted and selected here.



The status line (above the softkeys) displays the selected access.

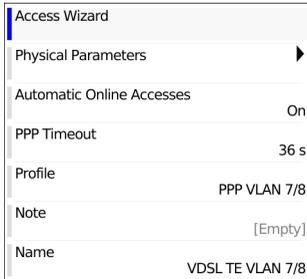
- <New> Creates a new access, see page 30.
 - <Edit> Edits an access, see page 30.
 - <More> The access marked in blue also moves when you scroll through the accesses using the ↑ and ↓ keys. In this way, ARGUS enables you to create a series of configured accesses so that the most commonly required accesses are readily available.
-  Switches to ARGUS status.



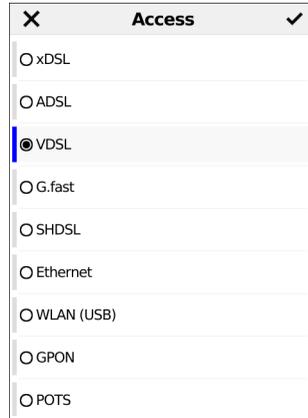
In the status display, the connection sockets that can be used for the selected connection are highlighted in white.

5.1 Access wizard

The access wizard prompts for different information depending on the access/interface. The prompts for the parameters depend on the parameters that were previously selected.



The screenshot shows the 'Access Wizard' configuration window. It contains several fields: 'Physical Parameters' with a right-pointing arrow, 'Automatic Online Accesses' set to 'On', 'PPP Timeout' set to '36 s', 'Profile' set to 'PPP VLAN 7/8', 'Note' set to '[Empty]', and 'Name' set to 'VDSL TE VLAN 7/8'.

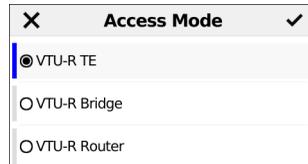


The screenshot shows a selection menu titled 'Access'. It lists several options with radio buttons: xDSL, ADSL, VDSL (selected), G.fast, SHDSL, Ethernet, WLAN (USB), GPON, and POTS.

Once the access has been selected, you can launch the access wizard in the menu using `<Edit>` (see image at left). The query parameters of the access wizard depend on the selected access (ADSL, VDSL, ...). You can now select the physical interface (see image at right).

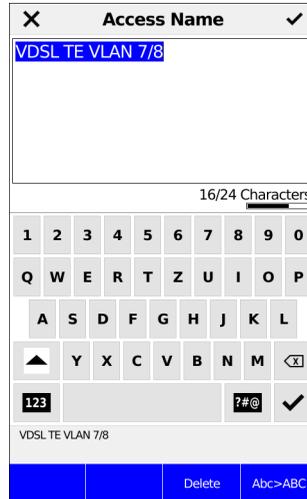
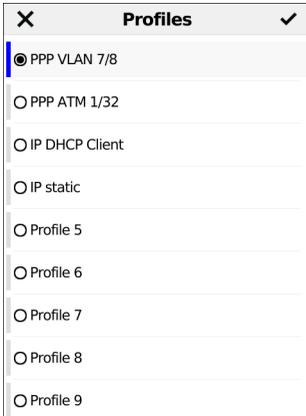


The screenshot shows a selection menu titled 'VDSL Line'. It lists two options with radio buttons: 2-Wire (selected) and 4-Wire (P1 + P2).



The screenshot shows a selection menu titled 'Access Mode'. It lists three options with radio buttons: VTU-R TE (selected), VTU-R Bridge, and VTU-R Router.

Selecting the number of twisted pairs (see image at left). A twisted-pair connection (dual copper cores) is used for normal VDSL accesses and a 4-wire connection is used for VDSL bonding accesses. Once this is completed, you can select the access mode (see image at right).



These preconfigured accesses can be linked to up to 20 profiles. These profiles link the access settings with the access and test parameters. You can set various parameters here including those for service and virtual line. The selected profile appears in the display in blue. The preset profile is indicated in the display with ● (see image at left).

Once you have selected the profile, the ARGUS suggests an access name, depending on the settings you made previously. You can enter up to 24 characters.

<Delete> Deletes access name



Clears mark and positions cursor keys to the start.



Clears mark and positions cursor keys to the end.

<Abc>ABC> Entry begins with upper-case letters and continues in lower-case.

<ABC>123> Entry of upper-case letters.

<123>abc> Numerical entry.

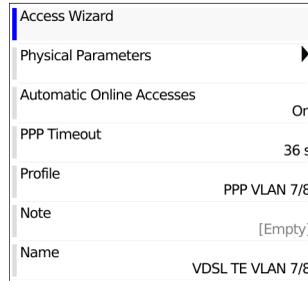
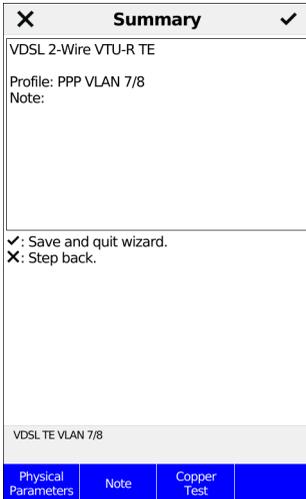
<abc>Abc> Entry of lower-case letters.



Entry of special characters, e.g. @, /, -, ., *, ?, %, =, &, ! etc.



Entry of special characters, e.g. _, :, +, # etc.



The ARGUS displays a summary of the configuration (see image at left).

<Physical Parameters> Edits the physical parameters, see page 33.

<Note> Entry of notes, see page 34.

<Copper Test> Editing of parallel copper tests possible.



Go back one level.



Save and exit the wizard.

Once you confirm with Enter, the ARGUS switches to the editing view of the selected access (see image at right). To configure the services or test parameters, select <Profile>.

You need to exit the access wizard before the ARGUS can use the configured access.

5.2 Physical Parameters

Access Wizard	
Physical Parameters	▶
Automatic Online Accesses	On
PPP Timeout	36 s
Profile	PPP VLAN 7/8
Note	[Empty]
Name	VDSL TE VLAN 7/8

Edits the physical parameters of the selected access. The physical parameters can also be opened and edited directly when the access wizard is finished.

5.3 Profile

Access Wizard	
Physical Parameters	▶
Automatic Online Accesses	On
PPP Timeout	36 s
Profile	PPP VLAN 7/8
Note	[Empty]
Name	VDSL TE VLAN 7/8

Profiles	
<input checked="" type="radio"/>	PPP VLAN 7/8
<input type="radio"/>	PPP ATM 1/32
<input type="radio"/>	IP DHCP Client
<input type="radio"/>	IP static
<input type="radio"/>	Profile 5
<input type="radio"/>	Profile 6
<input type="radio"/>	Profile 7
<input type="radio"/>	Profile 8
<input type="radio"/>	Profile 9

The preconfigured accesses can be linked to up to 20 profiles. These profiles link the access settings with the access and test parameters. You can set various parameters here including those for service and virtual line.



Select the profile you wish to edit. The selected profile appears in the display highlighted in blue. The default profile is indicated with a ● in the display.

Profile	
Services	▶
Router	▶
Bridge	▶
Test Parameters	▶
Profile Name	PPP VLAN 7/8

Test Parameters	
IP Ping	▶
Traceroute	▶
Path MTU	▶
iperf Client	▶
iperf Server	▶
ARGUS® Real Speed (RFC 6349)	▶
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

You can find more detailed explanations of the profiles on the following pages:
Services starting on page 83.

Profile name: for entering see Access name, page 31.

5.4 Notes

Access Wizard	
Physical Parameters	▶
Automatic Online Accesses	On
PPP Timeout	36 s
Profile	PPP VLAN 7/8
Note	[Empty]
Name	VDSL TE VLAN 7/8

VDSL TE VLAN 7/8
<input checked="" type="radio"/> VDSL 2-Wire VTU-R TE
Profile: PPP VLAN 7/8
Note: Dial-up with VLAN

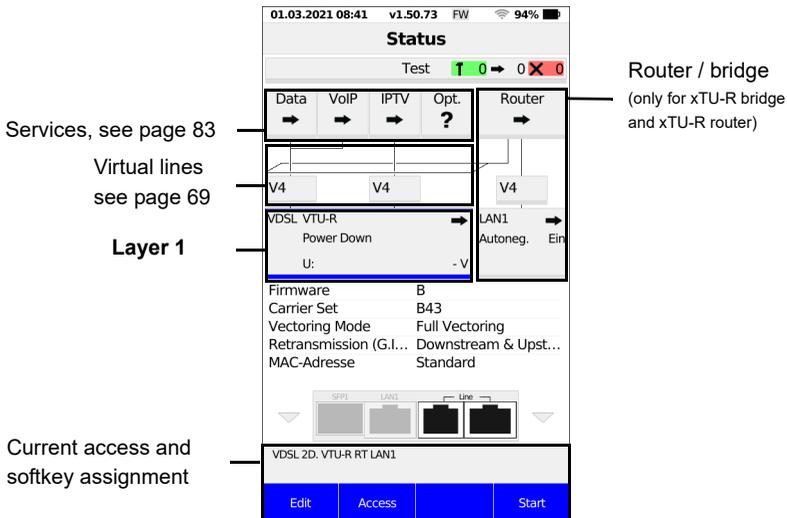
You can also add a note when editing an access. This note can be up to 49 characters long.

In addition to the selected access, the ARGUS will display, for example, the xDSL mode, the access mode and a freely editable note in the preview (in this example: Dialup with VLAN).

For more on entering notices see "Access name" on page 31.

6 Physical layer

The physical layer (layer 1) is shown in the status screen (Fig. 2) with its own graphical element (here VDSL). The other elements in the status screen are initially only named. This is explained in more detail on page 69 (Virtual lines) and page 83 (Services). The physical layers for the G.fast, ADSL, SHDSL and Ethernet interfaces are presented in the same way as for VDSL. The selection of the VDSL access and the access mode VTU-R are directly adopted in the status screen. If the defaults are correct, layer 1 (synchronisation on VDSL) can be established directly on <start>. The most important information such as voltage (U) and modem states (power down) are displayed in the layer-1 box (blue). To change the VDSL configuration directly, press <edit>. To change the access type directly in the status screen (Fig. 2), press the softkey <Access> or the key combination  and .



- <Edit> Changing DSL settings: see page
- <Access> Access selection: see page
- <Start> Synchronizing: see page

See page 83 for tests that can be run via layer 1.

7 Operation on G.fast and xDSL accesses

ARGUS supports G.fast and the following DSL interfaces: ADSL, VDSL, SHDSL.

In this connection, ARGUS supports the following access modes:

- xTU-R** Terminal device mode (fast/xDSL transceiver unit) see page 39.
The ARGUS is connected to the xDSL access (in front of or behind the splitter). The ARGUS replaces the modem and PC.
- xTU-R Bridge** Bridge mode (fast/xDSL transceiver unit) see page 59.
The ARGUS is connected to the xDSL access and the PC.
The ARGUS replaces the xDSL modem (for SHDSL only ATM and EFM).
- xTU-R Router** Router mode (fast/xDSL transceiver unit) see page 61.
The ARGUS is connected to the xDSL access and the PC.
The ARGUS replaces the xDSL modem and router (for SHDSL only ATM and EFM).
- STU-C** (STU-C: SHDSL transceiver unit-central office)
The ARGUS simulates the central office side (DSLAM).



The individual DSL tests record and store data (e.g. traces of IP data). It is the user's responsibility to comply with the applicable legal requirements.



The line may not carry a DC voltage greater than 200 V DC and should be free of AC voltage components.



In principle, the operating temperature range set out in "Technical data" (see page 17) applies for SHDSL operation. For ambient temperatures just below +50 °C, extended operation in high-performance modes can trigger the temperature-dependent ARGUS protection functions described in the safety information (see page 10).

7.1 Configuring G.fast and xDSL interfaces



In the ARGUS status, the layer-1 box highlighted in blue is selected.

<Edit> Opens settings

Note:

accessing functions via number keys/key combinations

You can call important functions/tests directly using the keys of the ARGUS keypad. You can find an overview of these key combinations on page 204.

7.2 G.fast and xDSL settings

The ARGUS stores all relevant settings for a test with the accesses. Only the relevant settings are applied, depending on the test situation. You can restore the default settings at any time (see page 192).

You can make the following relevant settings:

- Rated / threshold value
- INP/SNRM (ADSL only)
- Firmware (VDSL only)
- Carrier Set (VDSL only)
- Vectoring Mode (VDSL only)
- Retransmission (ADSL and VDSL only)
- MAC address
- Gratuitous ARP
- VLAN mode(ADSL only)
- Spectrum (SHDSL only)
- Data rate (SHDSL only)
- Power back off (SHDSL only)
- EOC usage (SHDSL only)
- Sync word (SHDSL only)
- Message mode (SHDSL only)
- Vendor info field (SHDSL only)
- Wire pairs (SHDSL only)
- Line probing (SHDSL only)
- Interop bits (SHDSL only)



When the router box highlighted in blue is selected in the ARGUS status, you can configure bridge/router settings.

<Edit> Opens settings

You can configure the following settings:

- IP version
- IPv4
- IPv6 (router only)
- VLAN (bridge only)
- Data log



You can obtain further information on settings in the ARGUSpedia on the instrument.

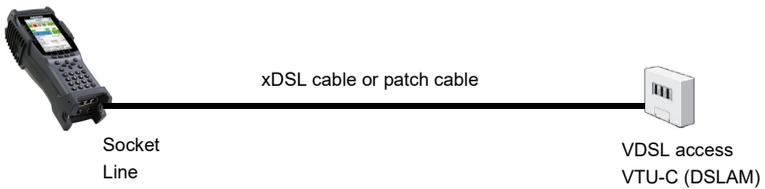
7.3 The ARGUS in access mode xTU-R

Determining the G.fast xDSL connection parameters using VDSL as an example (procedures also apply for ADSL and SHDSL connections)

The ARGUS is connected directly to the VDSL access via the supplied xDSL lead and the ARGUS socket line (either in front of or behind the splitter). In this case, the ARGUS replaces the modem and PC. It establishes a VDSL connection and determines all relevant VDSL connection parameters. The ARGUS displays the VDSL connection parameters and, if desired, saves them when the link is disconnected.



Use only the patch cables supplied with the device.



Establishing the G.fast and xDSL connection using VDSL as an example

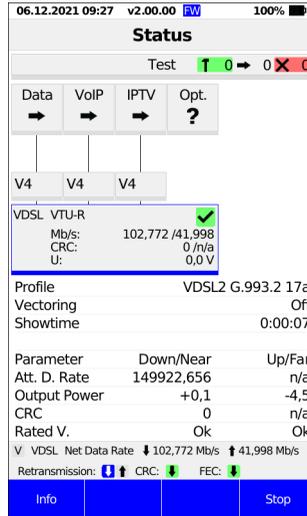
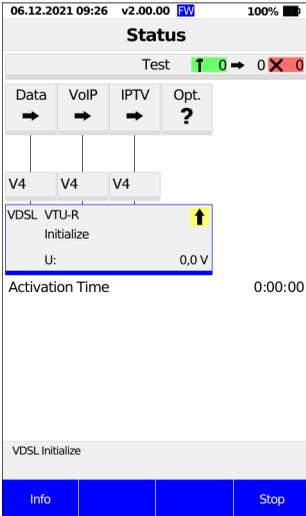
Profile configuration:

The ARGUS uses the settings and limit values stored in the respective profile for establishing a VDSL connection.

Additionally, the default profile is used.

<Edit> Changes VDSL settings and MAC address.

<Access> Selects a new access.



Establishing a VDSL connection

The ARGUS synchronises with DSLAM (LED "Sync/L1" flashes, display shows arrow on yellow background).

The ARGUS displays the current connection status (in this example "Initialize") in the layer-1 box (blue).

The activation time (elapsed time from the start of synchronisation in h:min:s) is displayed below the layer-1 box.

Connected

As soon as the connection is established (LED Sync/1 continuously illuminated and green check mark in the layer-1 box), the ARGUS determines the VDSL connection parameters and displays these below the layer-1 box. After synchronising, the ARGUS must remain connected to the VDSL access for at least 20 seconds. Only then can the ARGUS save all VDSL connection parameters

The layer-1 box displays the following information:

- Access and access mode
- VDSL profile (8,12,17, 30 or 35 MHz)
- d: downstream net data rate
- u: upstream net data rate
- Number of CRC and FEC errors in down- and upstream
- DC voltage on the interface

06.12.2021 10:15 v2.00.00 RW 100%		
VDSL Line		
Common		
Modem State	Showtime	
Profile	VDSL2 G.993.2 17a	
Activation Time	0:00:31	
Showtime	0:00:08	
Vectoring	Off	
Parameter	Down/Near	Up/Far
Net Data Rate	102,772 Mb/s	41,998 Mb/s
Att. D. Rate	149,954 Mb/s	53,277 Mb/s
Output Power	0,1 dBm	-4,6 dBm
FEC	0	n/a
Retransmitted	0	-
CRC	0	n/a
Rated V.	Ok	Ok
V VDSL Net Data Rate ↓ 102,772 Mb/s ↑ 41,998 Mb/s		
Retransmission: ↓ ↑ CRC: ↓ ↑ FEC: ↓		
Parameter	Statistic	Trace
		Graph

You can open a long-term view (see above) using the <Info> softkey.

Signalling of CRC/FEC error counters:

Symbol	Colour left and right	Explanation
 	green/green	No CRC/FEC errors occurred in the last second.
 	red/red	In the last second, CRC/FEC errors occurred in both upstream and downstream.
 	green/red	Only upstream CRC/FEC errors occurred in the last second.
 	red/green	Only downstream CRC/FEC errors occurred in the last second.

◀ VDSL Parameter		
Data Rate [kbit/s]	Down	Up
Net Data Rate	102772	41998
Attainable Data Rate	151756	51272
Relative Capacity		
%	67,7	81,9
SNR Margin	Down	Up
B0 [dB]	-	+6,4
B1 [dB]	+22,3	+10,0
B2 [dB]	+22,0	+6,4
B3 [dB]	+22,8	n/u
B4 [dB]	n/u	n/u
All [dB]	+22,4	+7,4

Loop Attenuation	Down	Up
B0 [dB]	-	+2,0
B1 [dB]	+2,5	+4,1
B2 [dB]	+4,3	+6,4
B3 [dB]	+5,3	n/u
B4 [dB]	n/u	n/u
All [dB]	+4,0	+4,1
Signal Attenuation	Down	Up
B0 [dB]	-	+2,0
B1 [dB]	+2,5	+4,1
B2 [dB]	+4,3	+6,1
B3 [dB]	+5,3	n/u
B4 [dB]	n/u	n/u
All [dB]	+4,0	+4,0

Select the softkey <Parameters> to open a detailed view of the parameters, in this example VDSL. You can view more parameters by swiping up and down on the touchscreen or using the softkeys (see images above and below).

Output Power	Down	Up
[dBm]	+13,7	-3,5
Interleave Delay	Down	Up
[ms]	+0,13	+1,00
Impulse Noise Prot.	Down	Up
[Sym]	+12,0	+0,5
Error Counter	Near	Far
FEC	0	0
CRC	0	0
ES	0	0
SES	0	0
LOSS	0	0
UAS	0	0
Reset	0	0

Resync		0
Resync		0
Showtime (No Sync)		0
Bitswap Events	Down	Up
	4	0
Vectoring		
Mode		Off
Seamless Rate Adapt.	Down	Up
Mode	Off	Off
Retransmiss. (G.INP)	Down	Up
Mode	On	Off

Electrical Length @ 1 MHz	R	C
[dB]	2,3	2,3
Vendor		
Vendor Far		BDCM
Version		49679
Vendor Near		IFTN
Version		35890

n/a not available

n/u not used

n/r not received



You can obtain further information on settings in the ARGUSpedia on the instrument.

Statistics		
Ethernet	Rx	Tx
Frames	836	0
Bytes	45640	0

<Statistic> Displays the statistics.

G.fast and VDSL (EFM) - Ethernet statistics

Frames number of all Ethernet frames received (Rx) and transmitted (Tx)

Bytes number of all bytes received (Rx) and transmitted (Tx)

The softkey "Trace" opens the following view:

Trace		
Time		Info
09:09:00:000	<	Open
09:09:03:510	<	VDSL
09:09:03:510	--	Silent
09:09:06:580	--	Handshake
09:09:09:700	--	Modem Full Init.
09:09:33:630	--	Showtime

Display of commands:

< = Command sent by ARGUS

> = Command sent by DSLAM

- = Connection status

Explanation of modem states such as "modem idle" ADSL/VDSL, see page 52 and SHDSL, see page 53.



When the ARGUS status, physical box or DSL trace displays the state "no common mode", this can indicate that the access in question is ADSL and not VDSL, or vice versa.

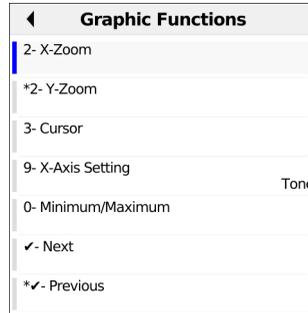
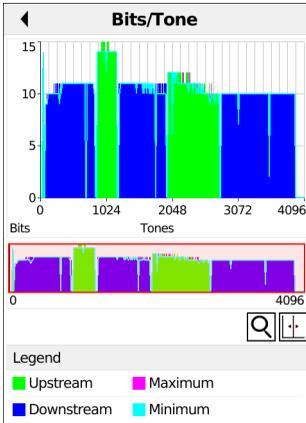
Display timestamp:

The ARGUS indicates the time (internal clock) the commands are received.

You can display a variety of graphical functions using the <Graph> softkey. The <Menu> softkey provides a precise description of the available options.



The following graphs and graph functions are only available for G.fast, ADSL and VDSL.



Displays the bit distribution, i.e. Transported bits per tone (channel)

y-axis: bits

x-axis: tones (channels)

Line interference sources (e.g. due to HDSL, RF, DPBO, etc.) can be identified on the basis of the bit distribution.



ARGUS switches to the previous display.

<Continue> Switches to next graph.

Graph functions

The graph functions such as zoom, cursor and setting of the x-axis enable detailed analysis of the graphs:



Exits the menu without changing.



You can also use this number key to toggle the zoom function within a graph.



The function of the cursor is described on page 46.



Switching the x-axis from tone to frequency is described on page 47.



Setting the min/max is described on page 48.



Switches automatically to the next graph with the view and adopts all settings for this graph

If the symbol in the display is black and white (), the graph has not yet been zoomed.

The symbol is green and white when the graph is zoomed ().

<Zoom (Y) +> Magnifies the middle section of the graph (100%).

<Zoom (Y) -> Reverses <Zoom (Y) +> and resets magnification



You can horizontally scroll through the zoomed range using the cursor keys or by tapping.

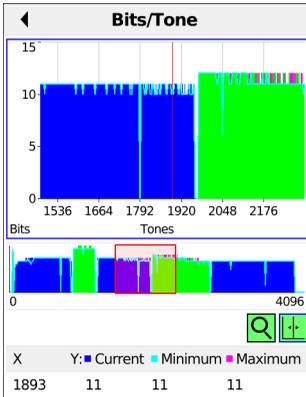


You can vertically scroll through the zoomed range using the cursor keys or by tapping.



The X-key returns the display to the unzoomed view.

The cursor functions enable precise determinations of the graphs.



Inserts the cursor directly.

When the Cursor function is started, a grey cursor line appears in the middle of the graph.

<Cursor> You can toggle the cursor on and off as needed using the Cursor softkey after activating it in the menu.

The values of the graph for the position under the cursor are displayed in the graph as follows:

x: 2107th tone

y: 7 bits



Use the left and right cursor keys to move the cursor to any point on the graph to measure it. Briefly pressing a cursor key causes the cursor to jump to by one position in the graph. When the cursor key is held down, the steps the cursor covers in the graph become progressively larger.



Use the vertical cursor keys to move the blue frame to the lower or upper graphic.

By toggling the x-axis (softkey 9) you can change its labelling from tone to frequency.



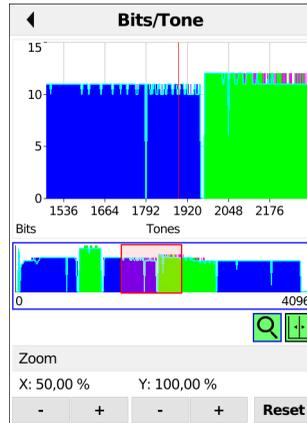
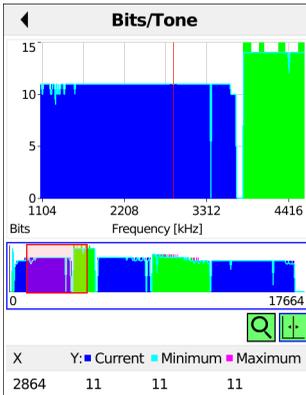
Available options:

Tone: Displays the values of the x-axis as tones

Frequency: Displays the values of the x-axis as frequencies



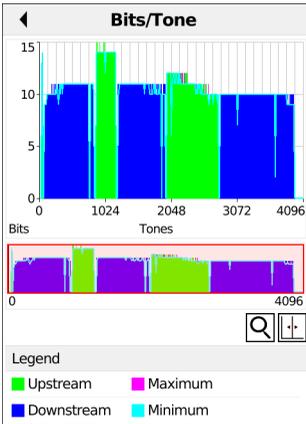
Direct setting of x-axis.



Use the left and right cursor keys to scroll through the range (in this example frequency).

The Zoom function and the Cursor function can also be combined. However, the starting position of the cursor can vary. The graph functions can be used for all graphs. If the cursor is displayed while the graph is zoomed, both symbols are green (see image at right).

With the Min/Max setting, the Bits/Tone and SNR/Tone graphs display the minimum and maximum values.



Magenta

Indicates the maximum value.

Light blue

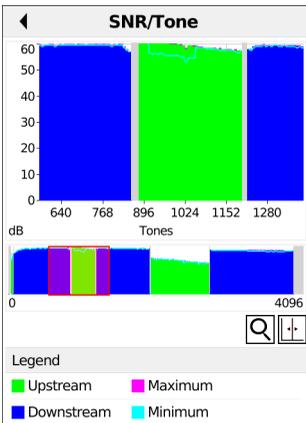
Indicates the minimum value

<Min/Max off> Hides min/max values.

<Min/Max Rst.> Resets min/max values.



Inserts softkeys directly.



<Continue> Display more graphs.

Display of signal-to-noise ratio (SNR) per tone (see image at left)

y-axis: SNR in dB
x-axis: tones (channels)

This enables interference sources for individual tones (channels) to be detected, in this example downstream power backoff (DPBO).

<Menu> Opens the graph functions (see page 44).

Display of quiet-line noise (QLN) per tone (see image at right). The QLN represents the quiet line noise of the twisted pair as a function of the frequency.

y-axis: QLN in dBm/Hz
x-axis: tones (channels)

The QLN enables detection of narrow-band interference sources due to e.g. coupling of medium-wave emission sources or defective switching components. These interference sources are represented as narrow peaks. The example at left shows a line with interference from a power supply.



Displays the amplitude component of the transmission function (HLOG) for each tone. HLOG shows the attenuation of a connection as a function of the frequency.

y-axis: Hlog in dB

x-axis: tones (channels)

On a nominally functioning line, the values drop off as the frequency increases; this function is virtually horizontal on short lines. This example shows a short line.

In the HLOG graphs, a shift can occur in calculating the upstream and downstream values from DSLAM compared to the downstream values from the ARGUS. It can also happen that DSLAMs do not transmit the HLOG upstream values or send falsified values.

DSL connections are often possible even though one of the two cores is high-ohm or even interrupted (only capacitive coupling). This results in dropped connections and data losses. Such problems can be due to oxidized lines, poor contacts in the telephone sockets, loose terminals or improperly insulated lines. In connections like this, lower frequencies are attenuated much more than higher frequencies. This is recognisable as an atypical relationship between upstream and downstream attenuation, as well as in the HLOG curve. In the event of a problem on one of the wires, the values for the low frequencies are often less than for the higher frequencies.

<Menu> Opens the graph functions (see page 44).

<Continue> ARGUS returns to the bits/tone graph.

Using the rule of thumb $L[m] = 50/f$ [MHz], you can estimate the length of a stub line if you know the frequency in MHz (in this example 0.535 MHz):

$$L [m] = 50/0,535 \text{ MHz} = 93 \text{ m}$$

There is a stub line approx. 93 m long.

In this example, given a frequency of approx. 3.85 MHz, the stub line is approx. 13 m long.

The ARGUS determines the following xDSL connection parameters:

- Net data rate (ADSL, VDSL and G.fast only)
- Attainable data rate (ADSL, VDSL and G.fast only)
- Relative capacity (ADSL, VDSL and G.fast only)
- Latency mode (ADSL only)
- Attenuation (ADSL and SHDSL only)
- Loop attenuation (VDSL only)
- Signal attenuation (VDSL and G.fast only)
- Output power
- SNR margin
- Impulse noise prot. (ADSL, VDSL and G.fast only)
- Interleave delay (ADSL, VDSL and G.fast only)
- FEC (ADSL, VDSL and G.fast only)
- CRC
- LOSWS (SHDSL only)
- HEC (ADSL only)
- ES
- SES
- LOSS (ADSL, VDSL and G.fast only)
- UAS
- Reset (ADSL, VDSL and G.fast only)
- Resync (ADSL, VDSL and G.fast only)
- Showtime no sync (VDSL and G.fast only)
- Bitswap events (ADSL, VDSL and G.fast only)
- Vectoring (VDSL only)
- SRA (Seamless Rate Adaption) (VDSL and G.fast only)
- Retransmission (G.INP) (ADSL, VDSL and G.fast only)
 - Data transmission units (DTU) (VDSL and G.fast only)
 - INP REIN (VDSL and G.fast only)
 - INP SHINE (VDSL and G.fast only)
 - ETR (VDSL and G.fast only)
- Elec.length@1MHz (VDSL and G.fast only)
- Vendor far (ADSL, VDSL and G.fast only)
 - Version (ADSL, VDSL and G.fast only)
- Vendor near (ADSL, VDSL and G.fast only)
 - Version (ADSL, VDSL and G.fast only)



You can obtain further information on parameters in the ARGUSpedia on the instrument.

System information for transmission to the ADSL/VDSL remote station



When a modem is synchronised with a DSLAM, the vendor and device type of the modem is generally displayed in the control system of the DSLAM.

For ADSL and VDSL, this occurs according to ITU-T G.997.1.

When an ARGUS device synchronises with a DSLAM, the latter reports to the control system the following:

Information	Display in DSLAM	Meaning
System vendor ID	0x04, 0x00 (hex)	Country code: Germany
	INGE or 0x49, 0x4E, 0x47, 0x45 (hex)	Provider code: intec Germany
	0x19, 1x01 (hex)	System FW version: 1.90.0
Version number	R1.90 U_	Device FW version: 1.90.0
Serial number	ARGUS300-9999-R1.90.0U_	Device type: ARGUS 300/device serial number 9999

Meaning of the modem states:

Colour	Short form	Explanation
red	■ DSL Idle	No-load
light blue	■ DSL Silent	ARGUS transmits handshake tones (silence on the DSLAM side).
yellow	■ DSL Handshake	A handshake (G.hs) signal from the remote station was detected.
orange	■ DSL Full init.	Start of the training phase following successful handshake.
green	■ DSL Showtime / Data	Showtime achieved. The TC sublayer is established. ARGUS is ready for operation.

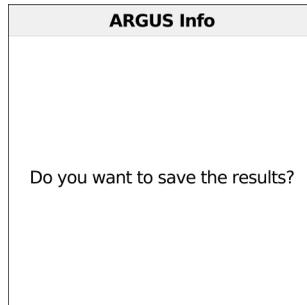
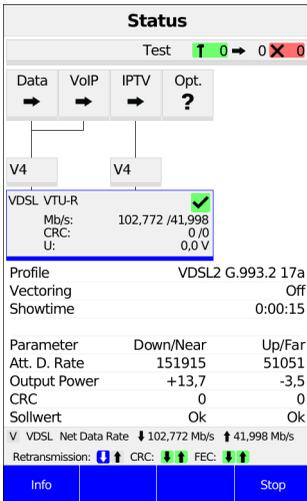
System information for transmission to the SHDSL remote station

When a modem synchronises with DSLAM, the vendor and device type of this modem are normally displayed in the DSLAM's control system. In SHDSL, this is carried out according to "ITU-T G.991.2 table 9-10". When an ARGUS device synchronises with a DSLAM, the latter reports to the control system the following:

Info:	Entry:	E.g. ARGUS:
Vendor ID	intec name	„intec“
Version model	Device type	„Argus300“
Vendor serial	Serial number	„9999“
Other vendor information	Device SW	„R1.90.0 U_“

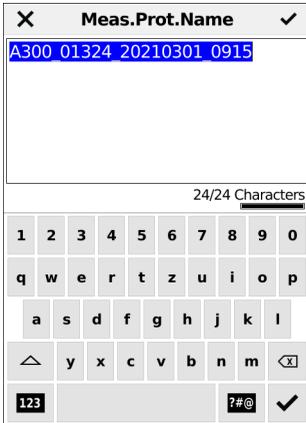
Meaning of the running EFM states (from the STU-R perspective)			
Power down			STU-R / STU-C in idle state.
Initialization	red	■ SHDSL Initialization	Initialisation - „power on“.
GHS startup	light blue	■ SHDSL GHS startup	Handshake according to ITU-T G.994.1, G.hs is started.
GHS transfer	yellow	■ SHDSL GHS t transfer	Replacement of the capability list completed.
Discovery			Start of the discovery phase.
Discovery accepted			Discovery probe accepted.
Discovery finished			Discovery phase finished.
Aggregation accepted			Aggregation probe accepted.
Aggregation finished			Aggregation phase finished.
GHS finished	orange	■ SHDSL GHS finished	Handshake (G.hs) successfully completed.
Data	green	■ SHDSL Data	Data mode achieved, showtime.
Data Error			An error, e.g. loss of sync. has occurred.

Disconnecting the G.fast and xDSL connection and saving the results



Select <Stop> to disconnect the live connection. You can now save the results (see image at right):

- <No> Results are rejected
- <Back> Results are not saved. The ARGUS returns to the status display.
- <Yes> Saving the result



X Meas.Prot.Name ✓

A300 01324 20210301 0915

24/24 Characters

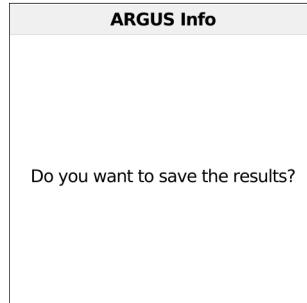
1 2 3 4 5 6 7 8 9 0

q w e r t z u i o p

a s d f g h j k l

△ y x c v b n m <X>

123 ?#@ ✓



ARGUS Info

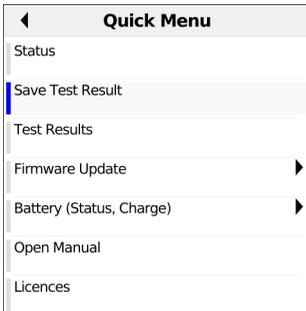
Do you want to save the results?

The ARGUS saves the connection parameters together with the trace data in the first free slot. You can enter a user-definable name when saving (see page 177). The ARGUS automatically suggests a name for saving the data that is made up of the following information:

- Device type (here A300)
- Serial number (here 1324)
- Configured date (here 01 March 2021)
- Set time (here 09:15)

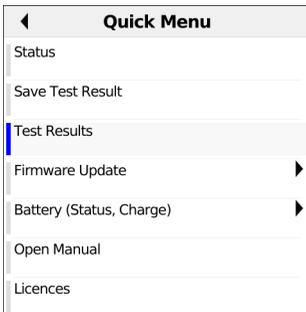
If all slots are occupied, you need to manually select a slot to overwrite. Press OK or check the box on the touchscreen to confirm saving the data.

Saving the results without disconnecting the G.fast or xDSL connection



You can save the results while the connection is active in the quick menu, without disconnecting. The option “Save measurement log” is not greyed out while the connection is active. The save name is generated in the same way as for a disconnected connection.

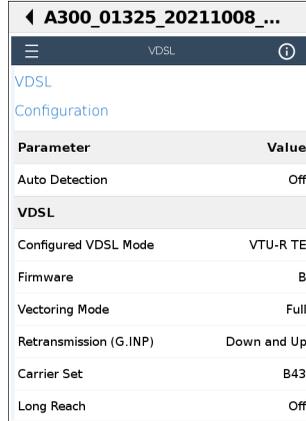
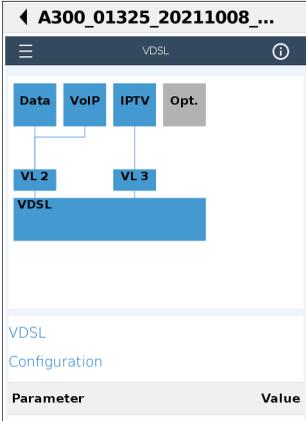
Displaying saved test results



The screenshot shows a 'Measurement Protocol' screen with a back arrow on the left. At the top, it displays '15.777 MB / 2.143 GB'. Below this is a list of saved test results, each with a blue bar on the left:

A300_01324_20210301_0915	01.03.2021 09:15:33 (1.496 MB)
A300_01324_20210301_0905	01.03.2021 09:05:46 (1.498 MB)
A300_01324_20210301_0858	01.03.2021 08:58:18 (1.481 MB)
A300_01324_20210301_0756	01.03.2021 07:56:41 (1.287 MB)
A300_01324_20201105_1426	05.11.2020 14:26:17 (1.521 MB)

You can now select the various measurement logs using the option “Measurement logs” in the quick menu.



These are displayed in the browser. You can view the results in detail by swiping the touch-screen or using the cursor keys (status screen at left, configuration screen at right).

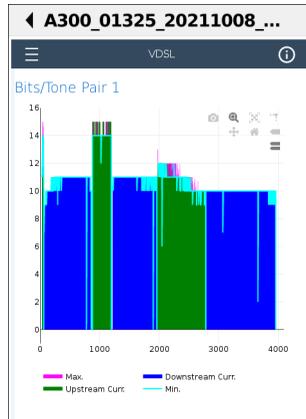
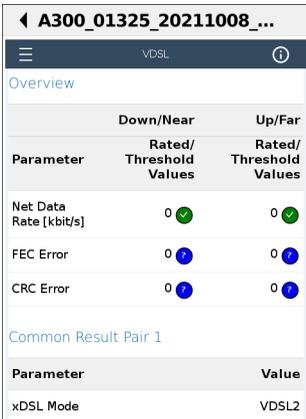
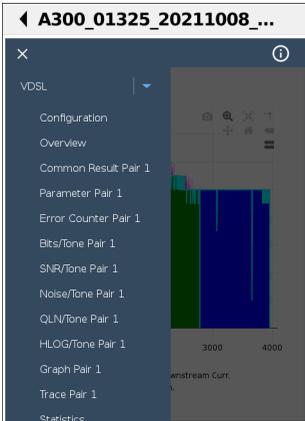


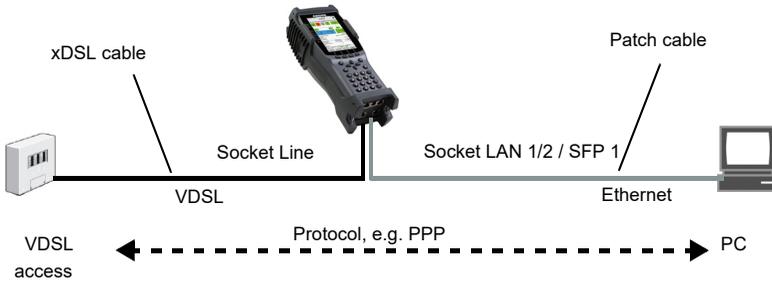
Illustration at left VDSL general, illustration at right bits/tone pair 1.



Clicking the menu key () opens a menu that displays various details of the measurement log. The respective item opens at a touch.

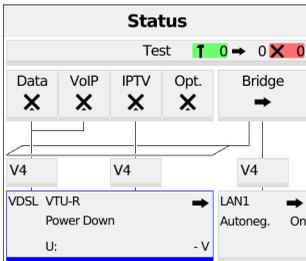
7.4 The ARGUS in access mode xTU-R bridge

Connect ARGUS to the PC using the patch cable and to the VDSL access using the xDSL cable. In bridge mode, ARGUS behaves like a VDSL modem, i.e. it passively conducts all packets from Ethernet to VDSL (and vice-versa). In this case, the PC is responsible for establishing the connection.



The ARGUS in access mode xTU-R bridge

In this example, VDSL VTU-R mode is configured and selected as described in Chapter 5, “Configuring accesses” (see page 28).

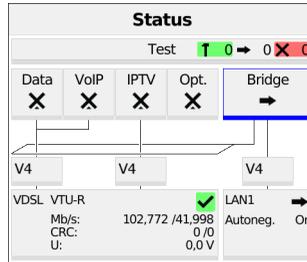
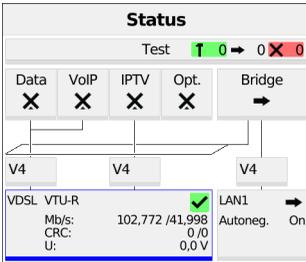


- <Edit> VDSL settings
- <Access> Change access
- <Start> Start VDSL



Switch to bridge mode using the cursor keys or touch display.

Establishing a VDSL connection

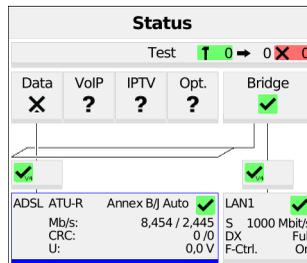
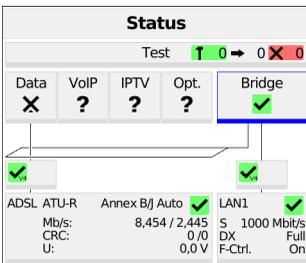


The VDSL connection is established (green check mark in the layer-1 box).

<Edit> Bridge/router parameter settings

The bridge can also be activated directly. If layer 1 has not yet been established, this is automatically started as well.

Establishing the VDSL bridge



<Stop> Deactivates bridge mode

<Info> Displays the activity of bridge mode.

When the physical layer is active (ADSL only), you can run the following tests using the softkey <Test>, see page 83.



No tests are available when bridge mode is active.



Displays the connection parameters.

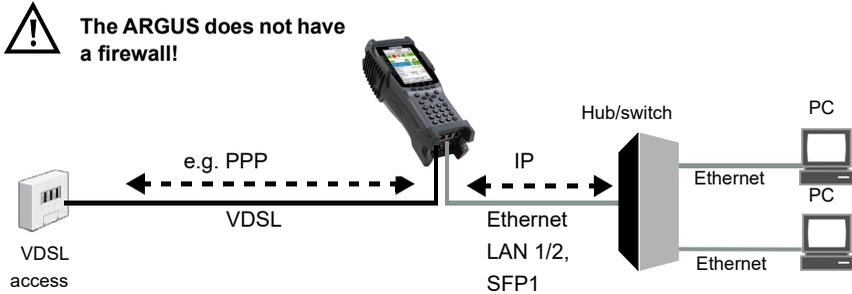
Switches to the layer-1 box and other elements, see page 70 for explanation.

<Info> or  Displays VDSL connection parameters, see page 42.

<Stop> Disconnects the VDSL connection and automatically deactivates the bridge.

7.5 The ARGUS in access mode xTU-R router

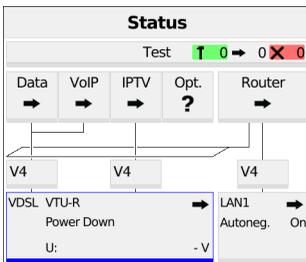
Connect the ARGUS to the PC using the patch cable and to the VDSL access using the xDSL cable. In router mode, the ARGUS replaces both the modem and the router, so that multiple PCs can access a network connection (via a hub/switch). The IP addresses of the network are either issued statically or the ARGUS is designated the DHCP server and assigns IP addresses to the connected PCs.



Settings for xDSL, see page 37:

Settings in access mode xTU-R bridge

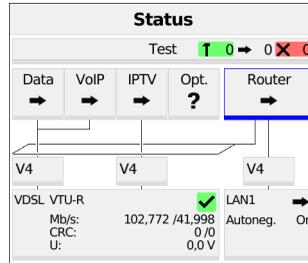
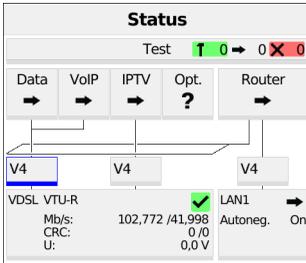
In this example, VDSL VTU-R router mode is configured and selected as described in Chapter 5, "Configuring accesses" (see page 28).



- <Edit> VDSL setting
- <Access> Change access
- <Start> Start VDSL



Switch to Router using the cursor keys.



The VDSL connection is activated and the virtual line selected (see picture at right).

When the physical layer is active (ADSL only), you can run the following tests using the softkey <Test>, see page 83.



No tests are available when router mode is active.

<Edit>

Parameter configuration, see Chapter 9 Virtual lines (VL) (see page 69).



Switch to "Router with the cursor keys or using the touch screen.

The router is selected (see image at right).

The router can also be activated directly. If layer 1 has not yet been established, this is automatically started as well.

<Edit>

Configuring the bridge/router parameters.

<Start>

See page 59 for bridge mode display and operation.

7.6 The ARGUS in access mode STU-C

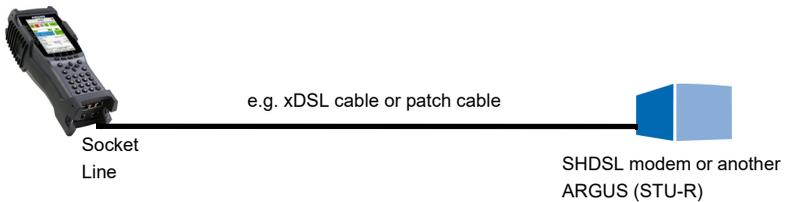
Determining the SHDSL connection parameters

The ARGUS is connected to the SHDSL modem directly using the supplied xDSL, patch, SHDSL 4-wire or SHDSL 8-wire banana cable. In this case, the ARGUS replaces the DSLAM (STU-C). The ARGUS establishes a SHDSL connection and determines all relevant SHDSL connection parameters. The ARGUS displays the SHDSL connection parameters and, if desired, saves them when the link is disconnected.

The procedure is the same for SHDSL 2-wire ATM, SHDSL 4, 6 and 8-wire connections and for EFM.



Use only the patch cable supplied with the device.



Configuring access mode STU-C:

SHDSL VTU-C mode is configured and selected as described in Chapter 5, “Configuring accesses” (see page 28).

Connecting SHDSL on the STU-C side:

Connect STU-C and display the connection parameters via <Info> as for VTU-R, see page 61.

When the SHDSL physical layer is active, you can run the following tests using the softkey <Test>, see page 83.

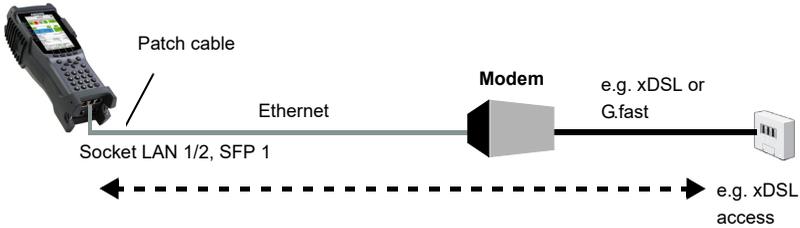
8 Operation on the Ethernet access

The ARGUS supports the following in Ethernet operation:

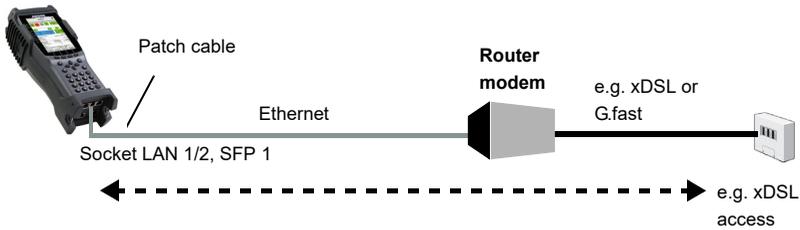


The individual tests acquire and store data. It is the user's responsibility to comply with the applicable legal requirements.

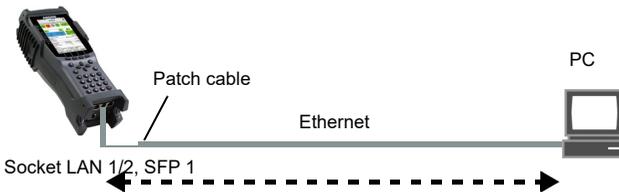
Connecting to a modem:



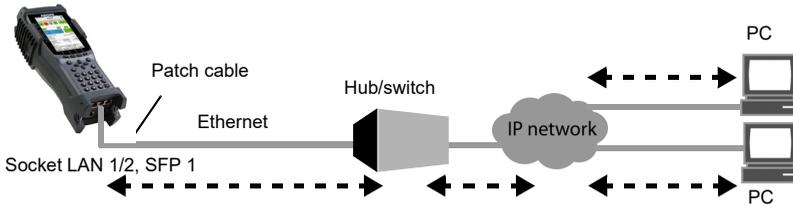
Connecting to a router modem:



Connecting to a PC via IP



Connecting to an IP network



8.1 Configuring Ethernet accesses

Configuring the Ethernet interface is described in Chapter 5, “Configuring accesses” (see page 28).

Note: accessing functions via number keys/key combinations

You can call important functions/tests directly using the keys of the ARGUS keypad. You can find an overview of these key combinations on page 204.

8.2 Ethernet configuration

You can modify the Ethernet settings as described for VDSL, see page 37.

You can configure the following settings:

- Autonegotiation
- MAC address
- Gratuitous ARP



You can obtain further information on settings in the ARGUSpedia on the instrument.

Autonegotiation/Ethernet link parameters

Ethernet link autonegotiation is supported by default! Setting: autonegotiation "on"

When negotiating the link parameters, ARGUS informs the remote station that the following is supported (these settings are fixed and cannot be configured):

- Speed: 10 or 100 Mbit/s
- Duplex: full or half
- Flow control on/off (for on: symmetric and asymmetric pause)

Manually configuring the Ethernet link parameters: autonegotiation "off"

When autonegotiation is deactivated, the speed, duplex and flow control ("pause" method) can be configured in the profile (see above).

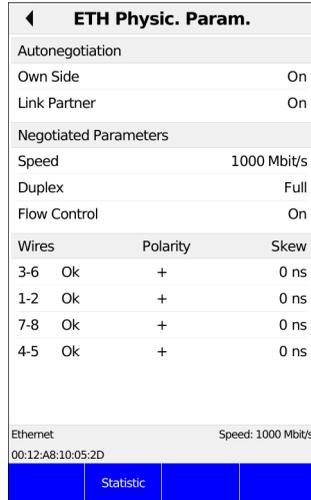
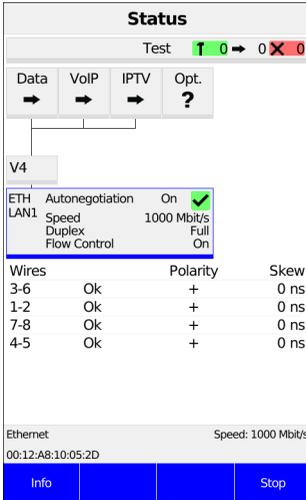
- 10 or 100 Mbit/s, default: **100 Mbit/s**
- Half or full duplex, default: **full**
- Flow control on/off ("Flow control off" is only useful in full duplex mode), default: **on**



Unilateral autonegotiation

When an end user device with autonegotiation "on" encounters a device without autonegotiation, no information is sent by the remote station. Even without autonegotiation, the speed is determined using the pulse method/idle pattern. In this case, the terminal device with autodetection generally drops back to half duplex (duplex mismatch possible), which can result in a duplex mode conflict with "poor throughput".

8.3 Establishing an Ethernet connection



The ARGUS uses the default profile to establish an Ethernet connection.

<Info> Displays Ethernet connection parameters

<Stop> Terminates Ethernet connection

Display (see image at right):

- Autonegotiation setting
- Autoneg. at other end
- Negotiated speed
- Type of duplex mode
- Flow control setting

<Statistic> Opens Ethernet statistics

The polarity and offset between the wires are displayed beneath the layer-1 box and in Info.

- Wire allocation
 - Left column ARGUS wire allocation
 - Right column ARGUS wire allocation after autonegotiation with remote terminal. When the display shows "OK", the remote station has inverted the wire allocation.
- Polarity
- Offset in ns

<Statistic> Opens Ethernet statistics

◀ Statistics		
Ethernet	Rx	Tx
Frames	509	0
Bytes	39243	0
Errors	0	0
Collisions		0

Statistic display:

- Received (Rx) and transmitted (Tx) internet frames
- Received (Rx) and transmitted (Tx) bytes
- Number of errors on the receiver (Rx) and transmitter (Tx) side
- Number of collisions

Disconnecting the Ethernet connection and saving the results

You can disconnect and save the results from an Ethernet connection as described for VDSL, see page 54.

Saving the results without disconnecting from the Ethernet connection

You can save your results for an Ethernet connection without disconnecting in the same way as for VDSL, see page 56.

9 Virtual lines (VL)

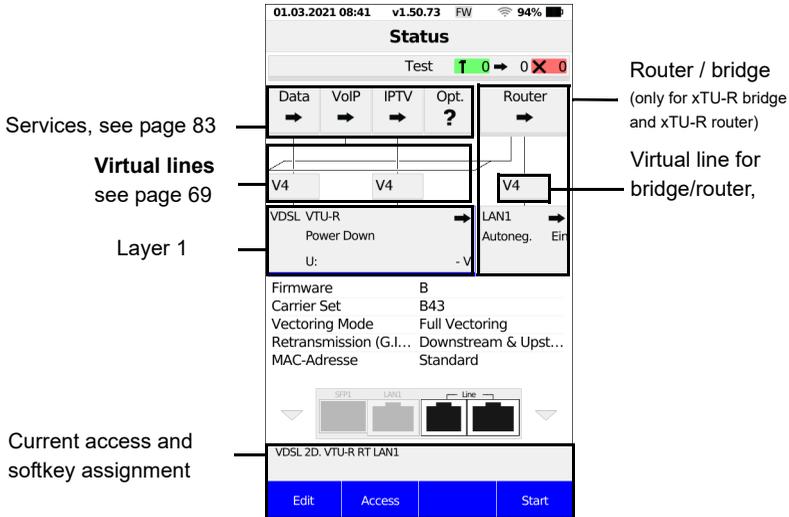
Virtual lines (VL) compile the configurations of layer 2 and layer 3 into profiles, called VL profiles. These profiles contain e.g. information on protocols, VPI/VCI, VLANs and PPP data (stored in their own subordinate PPP profiles). Virtual lines can be used to conduct tests across multiple VPI/VCI or VLANs and across different protocols.

The ARGUS allows you to define up to 20 such VL profiles. In a VL profile, you can edit e.g. the protocol configuration. The VL profiles can be assigned to one or more services independently of the state of the physical layer (layer 1). Thus, a data test (e.g. IP-ping) and a VoIP test (e.g. VoIP call) can be performed on a single active access without having to re-establish layer 1 (G.fast, DSL, Ethernet) in spite of differing protocols.

9.1 Virtual lines in the status screen

The virtual lines in the status screen are explained using the access VDSL VTU-R router as an example:

Status	
Test 1 0 0 X 0	
Data	VoIP
IPTV	Opt. ?
Router	
V4	V4
V4	
VDSL VTU-R	LAN1
Power Down	Autoneg. On
U: - V	
VL Profile	VLAN 7 (PPP)
Protocol	PPP
PPP Profile	PPP Profile 1
VLAN Mode	1: 7
IP Mode	DHCP Client
Own IP Address	0.0.0.0
VDSL 2w. VTU-R RT LAN1	
Edit	Profile



The status screen is divided into three levels that can be individually selected using the cursor keys of the ARGUS keypad.

The status screen is described in greater detail using three display examples.

Level 1: physical layer (see image at left)

- <Edit> Configure physical layer
- <Access> Access selection
- <Start> Establishes physical layer of the selected access.



Level 2: Virtual lines (see middle illustration)

- <Edit> Configure virtual line, see page 74.



- Possible configurations:
- Protocol (IP, PPP, PPTP)
- ATM
- VLAN
- PPP (PPP profiles)
- PPTP
- APN

- IP version (IPv4, IPv6, dual)
- IPv4
- IPv6
- BGP
- Data log (for this VL)
- Profile name

<Profile> Configures the profile.

Level 3: Services (see illustration at right)

<Edit> Assign a VL to a service and configure it

<Profile> Configure profile

<Start> Start service



The virtual line and the physical layer also start automatically when you press the softkey <Start>.

Depending on the status of the physical layer, the virtual lines or the services, the ARGUS displays a variety of symbols in the status screen.

-  This service has not yet been assigned to a virtual line.
-  This service, VL or physical layer is idle.
-  This service is not available (bridge mode only).
-  Preparing activation of physical layer, VL or service.
-  Activating the physical layer, VL or service.
-  Physical layer, VL or service deactivated due to an unexpected occurrence.
-  Deactivating.
-  Synchronisation achieved (physical layer) or a VL or service was activated successfully without errors.
-  A test is currently running in this service.
-  An error occurred here. Reset with <Reset> to continue with the VL.

9.2 Virtual line profiles (VL profiles)

The various profile types are explained below:

Profiles (1 - 20), see page 35

- These contain the assignments of the services (Data, VoIP, IPTV, Opt.) to one or more virtual lines.
- In addition to the services, the settings for the bridge/router and the test parameter can be found here as well.
- Each profile can be assigned an individual profile name.

VL profiles (Virtual lines 1 - 20)

- These contain the layer 2/3 settings.
- VL profiles are assigned to services.
- One VL can be assigned to multiple services.
- PPP profiles can be assigned to the VL profiles.

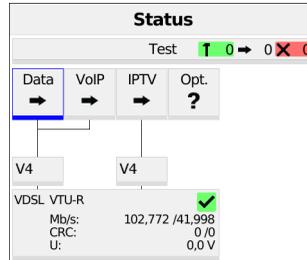
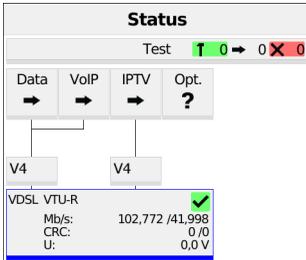
PPP profiles (1 - 20)

- They contain all relevant data for dialling.
- PPP profiles are assigned to VL profiles.
- A PPP profile can be assigned to multiple VL profiles.

9.3 Virtual line activation

A service or test must be started in order to activate a virtual line. To enable a test to be started, a service must be configured, and a virtual line assigned to it. In this example, the service DATA is configured and assigned to a virtual line.

9.3.1 Starting a service



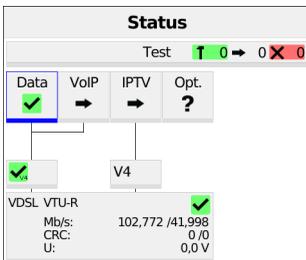
The VDSL connection is active (see image at right).



Use the cursor keys to switch from the layer-1 box over the virtual line to the service Data.



If the physical layer is not yet active, this is started automatically with the service or test.



<start> Starts the service.

The physical layer (VDSL), the virtual line and the service Data are now active. This is indicated by a green check mark.

<Info> Displays service Data information (e.g. duration of activity).

<stop> Terminates service Data.

For an explanation of the services, see page 83.

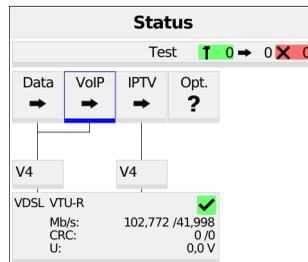
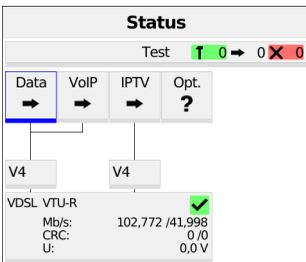
Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

The tests that can be run using the service Data are displayed.

<Setting> Configures the respective test (in this example IP ping). You can find a detailed description starting on page 85.

9.3.2 Assigning additional virtual lines

The ARGUS can use multiple services concurrently (e.g. Data and VoIP) via a single virtual line. In this example, VDSL is active. The service Data is selected. The following explains how multiple services can be connected via a single virtual line.



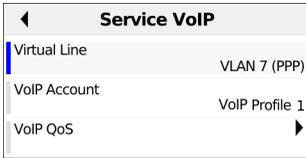
To configure a virtual line (in this example for the service Data) for other services, you must first stop the service. The physical layer remains active.



The service VoIP is greyed out when the VoIP option is not set.

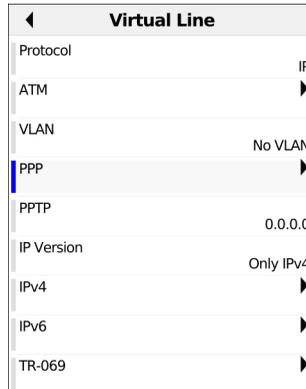
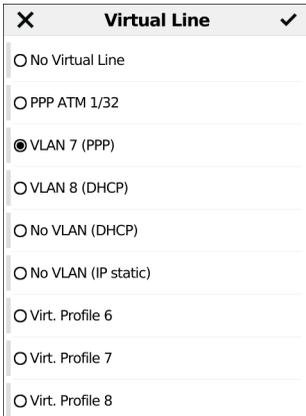


Using the cursor keys, select the service VoIP.



<Edit> Opens the configuration of the selected service (in this example VoIP).

Select "Virtual line".



Select the virtual profile you wish to edit. The selected profile appears in the display in blue.



Unavailable elements are greyed out, for instance when they are currently active.

<Edit> Edits the settings.

Edit the selected VL profile.



e.g. select PPP

Opens PPP profile selection.

9 Virtual lines (VL)

PPP Profiles

- PPP Profile 1
Provider: Manual
Username: [Empty]
Password: [Empty]
- PPP Profile 2
- PPP Profile 3
- PPP Profile 4
- PPP Profile 5
- PPP Profile 6
- PPP Profile 7
- PPP Profile 8

PPP Settings

- Username [Empty]
- Password [Empty]
- Set IP No
- Activation Delay 2 s

Select profile.



e.g. select PPP profile 1

Up to 20 PPP profiles can be configured.



Press the Back key four times to return to the Service VoIP menu.

Status

Test 1 0 → 0 X 0

Data → VoIP → IPTV → Opt. ?

V4 V4

VDSL VTU-R ✓

Mb/s: 102,772 /41,998 ✓
CRC: 0/0
U: 0,0 V

Status

Test 1 0 → 0 X 0

Data → VoIP ✓ → IPTV → Opt. ?

V4 ✓

VDSL VTU-R ✓

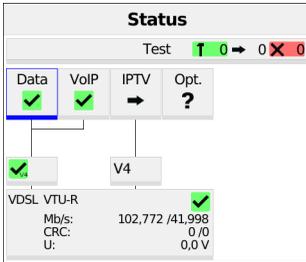
Mb/s: 102,772 /41,998 ✓
CRC: 0/0
U: 0,0 V

The services Data and VoIP are now connected to the physical layer (VDSL access) via a virtual line (see image at right).

<start> Starts the service VoIP

The service VoIP is now active (see image at right). You can now run a variety of tests via the service VoIP.

In the next step, you can activate a further service.

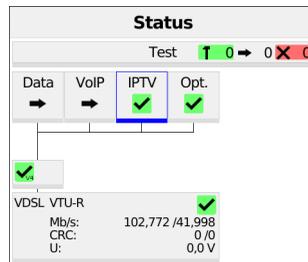
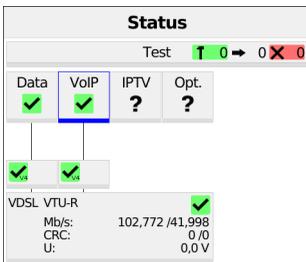


Select Data using the cursor keys and press <start> to activate the service.

The services Data and VoIP are active. You can now run a variety of tests via the services Data and VoIP.

The display and operation for IPTV and Opt. are the same as for VoIP.

Further examples of different virtual-line assignments:



Example 1 (illustration at left):

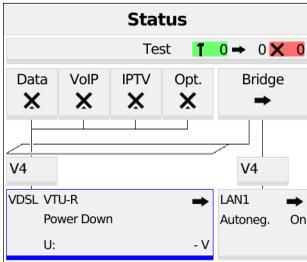
One virtual line is connected with the service Data and another with the service VoIP. The virtual line for VoIP can thus be used for different protocol data than the virtual line for Data.

Example 2 (illustration at right):

One virtual line was configured for the services VoIP, IPTV and Opt. In this example, the services IPTV and Opt. are active.



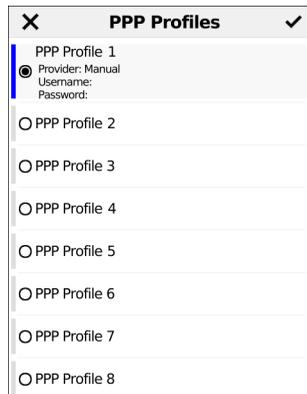
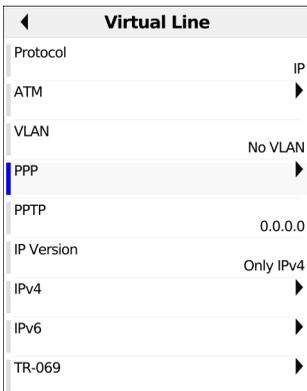
Up to four virtual lines can be established for the service IPTV. However, the ARGUS only displays these as a single composite virtual line. A detailed description is provided in the chapter IPTV, see page 138.



Example 3:

In this example, each service was assigned a virtual line. The services are unavailable because the ARGUS is in bridge mode.

9.4 PPP wizard



Select PPP.

Up to 20 PPP profiles can be configured.

<Edit> Edit the selected PPP profile.

9.5 Virtual line settings

The following virtual line settings can be configured:

- Protocol
 - IP
 - PPP
 - PPTP
- ATM
 - VPI/VCI
 - Encapsulation
 - ATM with Ethernet
- VLAN
 - no VLAN
 - 1 VLAN tag
 - 2 VLAN tags (QinQ)
- PPP
 - PPP profile 1-20
 - Profile name
- PPTP
- APN
- IP version
 - IPv4 only
 - IPv6 only
 - Dual stack IPv4/IPv6
 - Dual stack lite
- IPv4
 - IP mode
 - Own IP address
 - Netmask
 - Gateway
 - DNS server
 - DHCP client
 - DHCP server
- IPv6
 - AFTR
 - DHCP client
- BGP
- Data log
- Profile name



You can obtain further information on settings in the ARGUSpedia on the instrument.

9.6 Displaying protocol statistics

Depending on the access mode and the protocol, the ARGUS displays BRAS, IP, PPP, ATM or Ethernet statistics.

Status			
Test ↑ 0 → 0 ✗ 0			
Data	VoIP	IPTV	Opt.
✓	?	?	?
<div style="border: 1px solid gray; padding: 2px;"> ✓ </div>			
VDSL VTU-R ✓			
Mb/s:		102,772 /41,998	
CRC:		0 /0	
U:		0,0 V	

Status			
Test ↑ 0 → 0 ✗ 0			
Data	VoIP	IPTV	Opt.
✓	?	?	?
<div style="border: 1px solid gray; padding: 2px;"> ✓ </div>			
VDSL VTU-R ✓			
Mb/s:		102,772 /41,998	
CRC:		0 /0	
U:		0,0 V	

The physical layer, the virtual line and the service Data are now active.

<Info> Shows G.fast and DSL results

<Stop> Physik, VL und Data deaktivieren



Switches to the virtual line (VL) using the cursor keys or the touch screen.

VLAN 7 (PPP)		
BRAS Information		
AC Name	INTJ00-int	
Service Name	intec dualstack	
Session ID	14	
PPP User	user	
PPP Data Rate	Down	Up
[kbit/s]	n/r	n/r
PPP	Rx	Tx
Packets	40	30
Bytes	2723	1471
Ethernet	Rx	Tx
Frames	57	46
Bytes	4079	3625

When you select “Info”, the ARGUS displays the BRAS (only for PPP protocol) and the IP, PPP and Ethernet information (only for PPP) protocol).

Broadband Access Server (BRAS) information

- AC (access server) name: name of server
- Service name: name of service
- Session ID: Number of this connection

PPP information:

The ARGUS displays the received (Rx) and transmitted (Tx) PPP packets and the bytes.

Ethernet information:

The ARGUS displays the received (Rx) and transmitted (Tx) Ethernet frames and the bytes.

IPv6 Configuration	
Global Unicast Address	
1	FD00:DB8:1:4030:6D0D: 37D3:D590:1B2F
Link Local Address	
1	FE80::6D0D:37D3:D590:1B2F
DNS Server Address	
1	2001:DB8:1:200::300

Assigned PPP Configuration	
IP	10.5.108.113
Gateway	10.5.108.90
DNS 1	192.168.100.10
DNS 2	192.168.100.10

IP information:

The ARGUS displays the IP information as a function of the IP version.

IPv6 (illustration at left): The ARGUS displays the IP configuration assigned by the server:

- Global unicast address
- Link local address
- DNS address

IPv4 (illustration at right): The ARGUS displays the IP configuration assigned by the server:

- Received IP address
- Gateway IP address
- Available DNS servers

PPP Trace	
Info	Time
> PADO rec.	11:57:00:010
< PADR sent	11:57:00:010
> PADS rec.	11:57:00:020
< LCP conf. req.	11:57:00:030
< LCP conf. req.	11:57:03:030
> LCP conf. req.	11:57:03:040
< LCP conf. ack.	11:57:03:040
> LCP conf. ack.	11:57:03:040
< LCP echo req.	11:57:03:050
< PAP auth. req.	11:57:03:060
> LCP echo req.	11:57:03:060
< LCP echo rep.	11:57:03:060
> LCP echo rep.	11:57:03:060

> PAP auth. ack.	11:57:03:070
SRD: n/r	
SRU: n/r	
< IPV6CP conf. req.	11:57:03:080
> IPCP conf. req.	11:57:03:090
< LCP prot. rej.	11:57:03:090
> IPV6CP conf. req.	11:57:03:090
< IPV6CP conf. ack.	11:57:03:090
> IPV6CP conf. ack.	11:57:03:090

<Trace> Opens a PPP trace, which displays the PPP login process. It also assigns the individual messages to times according to the ARGUS system clock.

Display of commands

- < = Command sent by ARGUS
- > = Command sent by DSLAM

- PADI: PPPoE Active Discovery Initiation
- PADO: PPPoE Active Discovery Offer
- PADR: PPPoE Active Discovery Request
- PADS: PPPoE Active Discovery Session Confirmation
- PADT: PPPoE Active Discovery Termination
- IPv6 CP: IPv6 Control Protocol
- LCP: Link Control Protocol
- IPCP: Internet Protocol Control Protocol
- PAP: Password Authentication Protocol

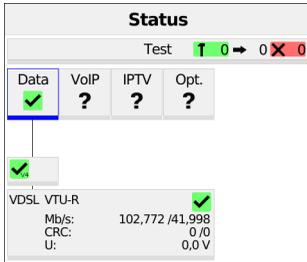
Table of abbreviations:

Abbreviation	Meaning
ack.	acknowledge
auth.	authentication
conf.	configuration
nak.	not acknowledge
prot.	protocol
rec.	received
rep.	reply
req.	request
rej.	rejected

10 Services + tests

The status screen (see explanation on page 69) shows four services. Each service can be used to conduct an entire suite of IP tests (see list below). It is also possible to start and stop each service independently of the others.

Example screen with the possible services:



- <Edit> Assigns the service a VL profile and configures the service.
- <Profile> Configures the profile.
- <Start> Activates the service. If virtual lines and the physical layer are not active, they are also automatically started.

See page 206 for an explanation of the symbols.

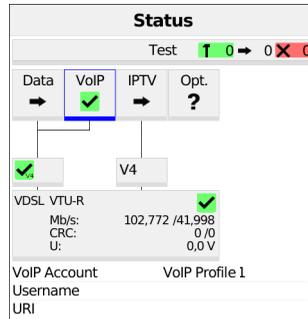
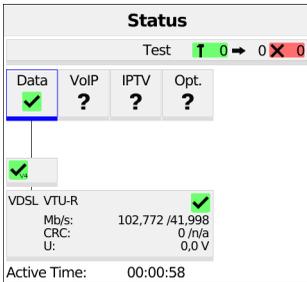
Once a service is activated, a variety of tests can be started using <Test>.

Services:			
Data	VoIP	IPTV	Opt.
- IP ping	- IP ping	- IP ping	- IP ping
- Traceroute	- Traceroute	- Traceroute	- Traceroute
- Path MTU	- Path MTU	- Path MTU	- Path MTU
- iperf-Client	- iperf-Client	- iperf-Client	- iperf-Client
- iperf-Server	- iperf-Server	- iperf-Server	- iperf-Server
- ARGUS [®] Real Speed			
- Speedtest [®] by Ookla [®]			
- HTTP download	- VoIP call	- IPTV	- HTTP download
- HTTP upload	- VoIP call acceptance	- IPTV zapping test	- HTTP upload
- FTP download	- VoIP call generator	- IPTV Monitor	- FTP download

- FTP upload - FTP server - Web browser			- FTP upload - FTP server - Web browser - Video on demand
*1 Ethernet only			

Possible tests that can be executed using the various services.

10.1 Displaying service statistics



The ARGUS in the status screen. The physical layer, VL and service are active. The duration of the activity is shown beneath the physical layer (see image at left).

The VoIP call parameters are displayed here in the service VoIP (see image at right), see page 130.

11 IP tests

11.1 IP ping

In IP ping, the ARGUS tests whether a connection to the internet service provider (ISP) or another computer or server address is possible via Ethernet, G.fast or xDSL using a DSLAM and the IP network. The ARGUS sends a test packet to a specified IP address (remote station) and waits for a response packet. On the basis of the received response packet, it is possible to draw conclusions as to the availability and delay of the IP network. It is also possible to measure the maximum data packet size of the path.

The IP ping needs the following parameters:

Protocol-independent parameters

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

You can configure the following settings:

- IP address
- Number of pings
- Pause
- Packet size
- Fragmentation



You can obtain further information on settings in the ARGUSpedia on the instrument.

IP Address	
<input checked="" type="radio"/>	www.argus.info
<input type="radio"/>	ipv6.argus.info
<input type="radio"/>	0.0.0.0

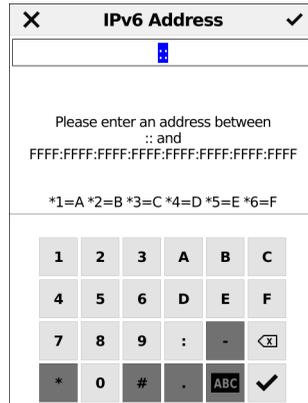
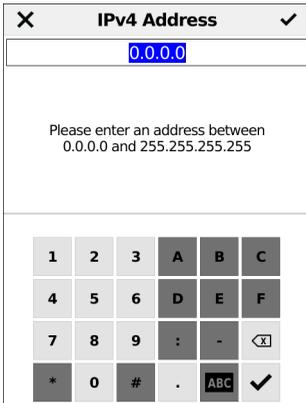
IP Address	
<input type="radio"/>	As IPv4 Address 0.0.0.0
<input type="radio"/>	As IPv6 Address ::
<input checked="" type="radio"/>	As Domain Name www.argus.info

The ARGUS displays the ten available slots for IP addresses. Mark the line with the IP address you wish to edit using the cursor keys or the touch screen (in this example the first slot is marked, see image at left).

<Edit> Edits the selected IP address.

The address can be saved in the form of an IPv4 number, IPv6 number or a name (see image at right).

Default: **www.argus.info**



Enter the IPv4 (see left image) or IPv6 address (see right image) in numerical form. The editable area is highlighted in blue. Enter the address using the number keys.

<Delete> Deletes the place in front of the cursor.



When entering an IPv6 address, the letters A-F are available.

to



Adopts the marked IP address as the default.

Toggle entry using the softkey (right softkey changes the meaning when pressed). Enters the address as name, see Access name, page 36. You can also enter the name by tapping characters on the touch screen.

- <Abc>ABC> Entry begins with upper-case letters and continues in lower-case.
- <ABC>123> Entry of upper-case letters.
- <123>abc> Numerical entry.
- <abc>Abc> Entry of lower-case letters.



Entry of special characters, e.g. @, /, -, ., ~, +, ...

or

_, :, ~, +, ...

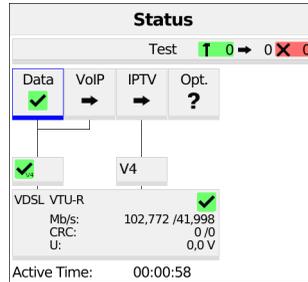
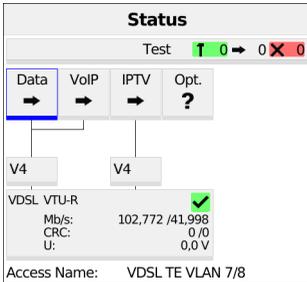


Moves the cursor in the display line.



For IPv6 addresses, you can use square brackets to include port information with IPv6 addresses in "IP address as name".

Starting IP ping (example access mode VTU-R, already active):



Connecting the service:

The profile shown in the display (in this example PPP VLAN 7/8) is used for IP ping.

<Edit> Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

- <Info> Duration of activation
- <Test> Opens test selection
- <Stop> Deactivates the service

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

IP Address
<input checked="" type="radio"/> www.argus.info
<input type="radio"/> ipv6.argus.info
<input type="radio"/> 0.0.0.0



Select IP ping.

<Setting> Change IP ping parameters.

The ARGUS displays the addresses stored in the protocol.



Select the address for the ping; the default is indicated with ● .

<Edit> Edit address, see page 85.



In this example a ping test is conducted with IP version IPv4. Use with IPv6 is analogous.

Status			
Test ↑ 1 → 0 × 0			
Data	VoIP	IPTV	Opt.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>			
VDSL VTU-R			<input checked="" type="checkbox"/>
Mb/s:	102,772 / 41,998		
CRC:	0 / 0		
U:	0,0 V		
IP Ping			↑

Test Overview	
IP Ping	↑
Sent:	6
Received:	6
Current:	23 ms
Maximum:	23 ms

Test Overview	
IP Ping	→
Sent:	10
Received:	10
Average:	22 ms
Maximum:	23 ms

Pressing OK automatically starts the IP ping.

In the status screen, you can select <Test> (at the top) to see which IP ping is currently running (see image at left).

Selecting <Test> again opens the test overview. During the IP ping test, a green hammer can be seen to the right of "IP ping" (see top right image), and an arrow appears there after the IP ping test is complete (see bottom right image).

Display during the IP ping test:

- Number of test packets sent
- Number of response packets
- Current time in ms
- Maximum time in ms

Display after the IP ping test:

- Number of test packets sent
- Number of response packets
- Average time in ms
- Maximum time in ms

◀ IP Ping	
Pings	
Sent	10
Received	10
Repeated	0
Checksum Error	0
Error	0
Times	
Minimum	22,595 ms
Maximum	23,838 ms
Average	22,910 ms
Configuration	
Packet Size	84 Byte

Target	
URL	www.argus.info
IPv4	185.224.154.37
Used Version	IPv4

<Detail> Opens a detailed overview of the test results.

The ARGUS displays the results when the test is finished:

- Number of packets sent
- Number of packets received
- Number of packets repeated
- Checksum errors
- Number of packets received with error
- Minimum packet response time in ms

- Maximum packet response time in ms
- Average packet response time in ms
- Selected packet size in bytes
- Display of destination URL
- Display of IPv6 address
- Display of IPv4 address
- Indication whether IPv4 or IPv6 is used

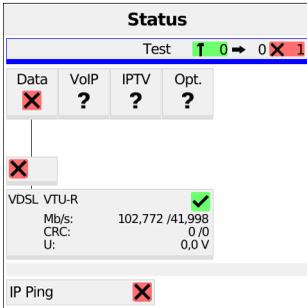
<Restart> Starts a new IP ping test.

<Stop> Stops the IP ping test with the option to save.

Test Overview											
IP Ping	IP Ping 1										
Sent: 10	Sent: 7										
Received: 10	Received: 7										
Average: 22 ms	Average: 22 ms										
Maximum: 23 ms	Maximum: 23 ms										
<table border="1"> <tbody> <tr> <td>IP Ping</td> <td>1</td> </tr> <tr> <td>Sent: 2</td> <td></td> </tr> <tr> <td>Received: 2</td> <td></td> </tr> <tr> <td>Average: 22 ms</td> <td></td> </tr> <tr> <td>Maximum: 22 ms</td> <td></td> </tr> </tbody> </table>		IP Ping	1	Sent: 2		Received: 2		Average: 22 ms		Maximum: 22 ms	
IP Ping	1										
Sent: 2											
Received: 2											
Average: 22 ms											
Maximum: 22 ms											
Data VoIP IPTV Opt.											

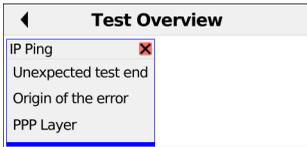
Press Back to return to the test overview. You can start a new test as needed by selecting <New>. The xDSL link and the service are still connected (the connection can be disconnected in the status screen with <Stop>).

The test overview displays multiple active and completed tests (see image).



Error messages in IP ping

ARGUS displays an X in a red field in the status for data and VL as soon as an error occurs (see image at left). Clicking “Info” displays the error message (see image at right).



Open the test overview to obtain more detailed information on the source of the error (see image).

11.2 Traceroute

In IP traceroute, the ARGUS sends test packets and displays all hops and their response times on the way to the destination address. This data enables precise localisation of possible delays in the network.

The following parameters must be saved in the profile for the IP traceroute:

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

The following test parameters can be configured:

- IP address
- Maximum hops
- Probes
- Timeout



You can obtain further information on settings in the ARGUSpedia on the instrument.

Starting traceroute

(Example: access mode VTU-R, already active)

The screenshot shows the 'Status' window with a 'Test' indicator showing 1 green, 0 yellow, 0 red, and 0 crossed-out. The 'Data' service is selected and highlighted with a blue box. Below it, two 'V4' protocols are shown. The 'VDSL VTU-R' protocol is active, with a green checkmark. The statistics for VDSL VTU-R are: Mb/s: 102,772 / 41,998; CRC: 0,0; U: 0,0 V. The 'Access Name' is 'VDSL TE VLAN 7/8'.

The screenshot shows the 'Status' window with the same 'Test' indicator. The 'Data' service is now shown with a green checkmark. Below it, the 'V4' protocol is shown with a green checkmark. The 'VDSL VTU-R' protocol is also shown with a green checkmark. The statistics for VDSL VTU-R are: Mb/s: 102,772 / 41,998; CRC: 0,0; U: 0,0 V. The 'Active Time' is '00:00:58'.

Connecting the service.

The profile shown in the display (in this example profile 1) is used for the traceroute test.

<Edit> Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Traceroute	
IP Address	www.argus.info
Maximum Hops	25
Probes	3
Timeout	3,000 s



Select traceroute

<Setting>

Change traceroute parameters, see page 93.

IP Address	
<input checked="" type="radio"/>	www.argus.info
<input type="radio"/>	ipv6.argus.info
<input type="radio"/>	0.0.0.0

Test Overview	
Traceroute	
Hops:	9

The ARGUS displays the IP addresses or URLs saved in the protocol (see image at left).



Select the address for the traceroute test; the default is indicated with ● .

<Edit>

Edit address, see page 85.



In this example a traceroute test is conducted with IP version IPv4.
Use with IPv6 is analogous.

The traceroute test starts automatically.

Display during the traceroute test (see image at right):

- Current hop and probe, in this example:
7 - 1: i.e. 7th hop and 1st probe
- Response time of hop for current attempt (0.000 seconds)
- IP address of the current hop, with name if applicable

Traceroute		
Hop	Target	Time
1	10.5.100.1 ---	0,005 s
2	192.168.100.1 ---	0,006 s
3	62.155.244.90 p3e9bf45a.dip0.t-ipconnect.de	0,010 s
4	217.5.67.162 f-ed12-i.F.DE.NET.DTAG.DE	0,015 s

Target	
URL	www.argus.info
IPv4	185.221.105.52
Used Version	IPv4

Open "Details" to display the IP addresses of the individual hops and any names as well as their response times, for example: 217.5.90.126, 0.013 s.

This also shows the destination URL and the IP address as well as the IP version used.



Cancels test

Displays the test results up to this point, with possibility of saving (automatic prompt).

Saving traceroute result see also IP ping (see page 91).

11.3 Path MTU test

The Path MTU test is a standalone part of ARGUS® Real Speed (RFC6349). The test determines the maximum packet size that can reach a destination without fragmenting packets.

The Path MTU test needs the following parameters:

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

The following test parameters can be configured:

- IP Address
- Pause
- Timeout
- Number of Packets



You can obtain further information on settings in the ARGUSpedia on the instrument.

Starting Path MTU (Example: access mode VTU-R, already active):

Connecting the service.

The profile shown in the display is used for the Path MTU test.

<Edit> Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

- <Info> Duration of activation
- <Test> Opens test selection
- <Stop> Deactivates the service

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Path MTU	
IP Address	www.argus.info
Pause	1,000 s
Timeout	1 s
Number of Packets	3



Select Path MTU.

- <Setting> Change Path MTU parameters.

The ARGUS displays the addresses saved in the profile.



Select the address for the Path MTU test; the default is indicated with ●.

- <Edit> Edit the address.



In this example a Path MTU test is conducted with IP version IPv4. Use with IPv6 is analogous.

Test Overview	
Path MTU	▶
Current Size	750 Byte
t:	00:00:03

Test Overview	
Path MTU	↔
Determined Size	1492 Byte

The Path MTU test starts automatically. In the test overview you can observe the running test.

11.4 iperf Client

The iperf client is a data throughput test against an iperf server.

The iperf client needs the following parameters:

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

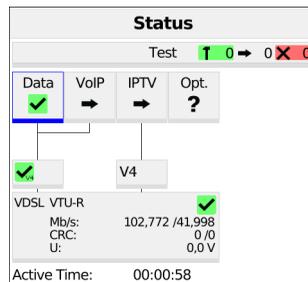
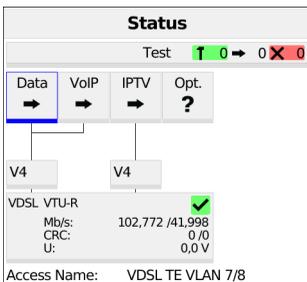
You can configure the following settings:

- IP Address
- Version
- Test Direction Version 2
- Test Direction Version 3
- Port Version 2
- Port Version 3
- Protocol
- Bandwidth Limit
- Test Duration
- Window Size



You can obtain further information on settings in the ARGUSpedia on the instrument.

Starting iperf Client (Example: access mode VTU-R, already active):



Connecting the service.

The profile shown in the display is used for the iperf Client.

<Edit>

Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

- <Info> Duration of activation
- <Test> Opens test selection
- <Stop> Deactivates the service

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

iperf Client	
IP Address	www.argus.info
Version	Version 3
Test Direction Version 2	Send
Test Direction Version 3	Send
Port Version 2	5001
Port Version 3	5201
Protocol	TCP
Bandwidth Limit	No
Test Duration	30 s



Select iperf Client.

- <Setting> Change iperf Client parameters.

The ARGUS displays the addresses saved in the profile.



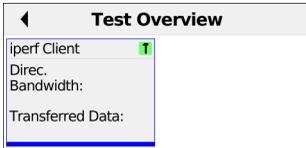
Select the address for the iperf Client; the default is indicated with ●.

- <Edit> Edit the address.



In this example an iperf Client is conducted with IP version IPv4.
Use with IPv6 is analogous.

The iperf Client test starts automatically.



In the test overview you can observe the running test.

11.5 iperf Server

The iperf server is the remote station for a data throughput test with an iperf client.

The iperf server needs the following parameters:

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

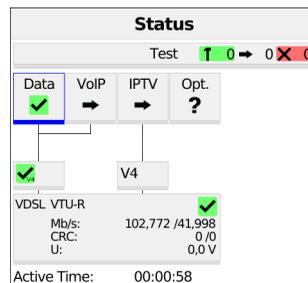
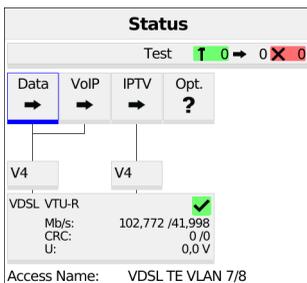
You can configure the following settings:

- Version
- Port Version 2
- Port Version 3



You can obtain further information on settings in the ARGUSpedia on the instrument.

Starting iperf Server (Example: access mode VTU-R, already active):



Connecting the service.

The profile shown in the display is used for the iperf Server.

<Edit> Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

- <Info> Duration of activation
- <Test> Opens test selection
- <Stop> Deactivates the service

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

iperf Server	
Version	Version 3
Port Version 2	5001
Port Version 3	5201



Select iperf Server.

- <Setting> Change iperf Server parameters.

The iperf Server starts automatically.

Test Overview	
iperf Server	
IPv4:	10.5.100.156
IPv6:	Not Used

In the test overview you can observe the running test.

11.6 ARGUS® Real Speed

ARGUS® Real Speed is an RFC6349 test against an iperf server.

The ARGUS® Real Speed needs the following parameters:

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

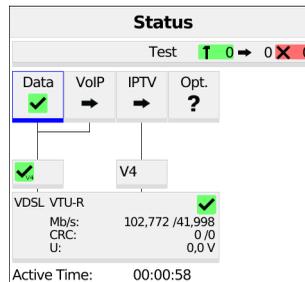
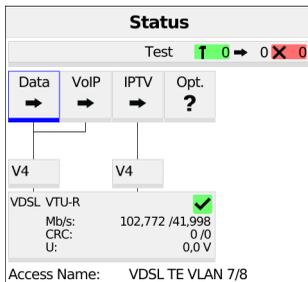
You can configure the following settings:

- IP Address
- Version
- Port Version 2
- Port Version 3
- Test Duration



You can obtain further information on settings in the ARGUSpedia on the instrument.

Starting ARGUS® Real Speed (Example: access mode VTU-R, already active):



Connecting the service.

The profile shown in the display is used for the ARGUS® Real Speed.

<Edit> Assign a virtual line to the service Data.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

The service Data and the VDSL connection are active (see image at right).

- <Info> Duration of activation
- <Test> Opens test selection
- <Stop> Deactivates the service

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Real Speed (RFC 6349)	
IP Address	www.argus.info
Version	Version 3
Port Version 2	5001
Port Version 3	5201
Test Duration	30 s



Select ARGUS® Real Speed.

- <Setting> Change ARGUS® Real Speed parameters.

The ARGUS will display the addresses saved in the profile.



Select the address for the ARGUS® Real Speed; the default is indicated with ●.

- <Edit> Edit address.



In this example an ARGUS® Real Speed is conducted with IP version IPv4. Use with IPv6 is analogous.

ARGUS® Real Speed starts automatically.

Test Overview	
RFC 6349	
Status	Path MTU
t:	00:00:01

Test Overview	
RFC 6349	
Status	TCP Throughput Send
t:	00:00:22

In the test overview you can observe the running test.

11.7 HTTP download

In HTTP download, the ARGUS downloads the data of a website or file. The ARGUS displays the current "net download rate", the usable data of the IP packets, and following conclusion of HTTP download the average speed (for multiple download attempts).

The following parameters must be saved in the profile for the HTTP download:



No meaningful evaluations are possible for download tests with a duration of less than 10 seconds.

Therefore, the download file should be as large as possible (depending on the access speed). If the duration of the test is less than 10 seconds, the ARGUS does not display any data rate or time.

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

The following test parameters can be configured:

- Server Profile
- Server Address
- FTP Port
- Download Filename
- Upload Filename
- Upload Filesize
- Username
- Password
- Number of Up-/Downloads
- Number of Parallel Downloads
- Number of Parallel Uploads
- Profile Name



You can obtain further information on settings in the ARGUSpedia on the instrument.



If a www alias address is entered as the "Source/destination address", the ARGUS downloads "only" the HTML page in HTML download. The ARGUS does not evaluate the HTML code, so that any link to a "real" www address is not considered. In this case, the ARGUS does not indicate an error, as the HTML page of the specified "Source/destination address" was loaded without error.



Be sure to enter the "source" address (server address and download file name) precisely as set out (upper/lower case). Otherwise the ARGUS will return error 301 (Moved Permanently) or 404 (Not Found).

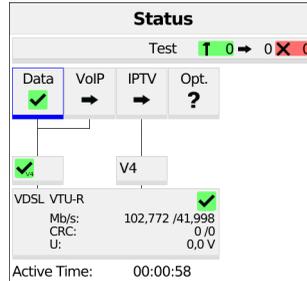
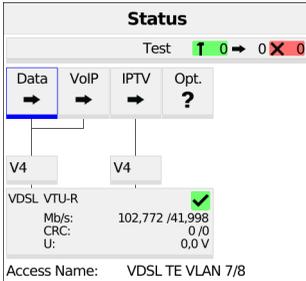


When requesting multiple download components, the ARGUS may reduce the number of downloads depending on the server support, which can cause deviations from the set parameters. This can occur e.g. as soon as the size of the requested file is unknown.



If the download file name exceeds the maximum permissible length, you can work around this limit by fragmenting the address and additionally using the "Server" field. The server name may be up to 80 characters long, the file name 60 characters long.

Starting HTTP download (example: access mode VTU-R, already active)



Connecting the service.

The profile shown in the display (in this example profile 1) is used for HTTP download.

<Edit> Adds a virtual line to the service Data.

If no connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Server Profiles	
<input checked="" type="radio"/>	Server Profile 1
<input type="radio"/>	Server Profile 2
<input type="radio"/>	Server Profile 3
<input type="radio"/>	Server Profile 4
<input type="radio"/>	Server Profile 5
<input type="radio"/>	Server Profile 6
<input type="radio"/>	Server Profile 7
<input type="radio"/>	Server Profile 8
<input type="radio"/>	Server Profile 9



Select HTTP download.

<Profile> Displays the available HTTP download profiles (see image at left).

Mark the server profile:
(default is indicated with ●).

The server profiles are also used for HTTP upload, FTP download and FTP upload.

<Edit> Edits the marked profile, changes the individual settings.

HTTP download starts automatically.

Test Overview	
HTTP Download ↑	HTTP Download ↑
Speed: 70,717 Mb/s	Speed: 43,613 Mb/s
Progress: 44 %	Progress: 33 %
Filesize: 95,367 MB	Filesize: 47,683 MB
<div style="display: flex; justify-content: space-between;"> Data VoIP IPTV Opt. </div> <div style="display: flex; justify-content: space-between; align-items: center;"> ↓ 99,767 Mbit/s 2,066 Mbit/s ↑ </div> <div style="font-size: small;"> V VDSL Net Data Rate ↓ 102,772 Mb/s ↑ 41,998 Mb/s Retransmission: ↑ ↓ CRC: ↑ ↓ FEC: ↑ ↓ </div>	

HTTP Download	
Bitrate (L4 Payload)	
Current	43,970 Mb/s
Average	43,970 Mb/s
	11 %
Current	5,666 MB
Overall	47,683 MB
Overall	37 %

Current	80,337 MB
Overall	143,050 MB
Time	
Elapsed	00:00:04
Remaining	00:00:02
Parallel Downloads	
Current	3
Configured	3
Target	
URL	iptest.testnetz
IPv4	192.168.100.20
Used Version	IPv4

You can observe the running test in the test overview. You can access the long-term view (see images at right) via “Details”.

Display during HTTP download::

- Current download/total number of downloads.
- Status
- Current net average download rate
- Current net average download rate
- Bytes transferred so far
- Size of downloaded file
- Data transferred so far
- Total data transferred
- Transfer time so far in h:min:s
- Remaining transfer time in h:min:s
- Number of parallel downloads
- Destination URL
- IP version and IP address used

Test overview display:

You can observe the running test or start a new test here, see page 155.

- <New> Selects a new single test.
- <stop> Stops the HTTP download test.

Save HTTP download result, see page 91.

11.8 FTP download

In FTP download, the ARGUS downloads data in the form of a file. The ARGUS displays the current net download rate, the usable data of the IP packets, and following conclusion of the test the average speed (for multiple download attempts).



No meaningful evaluations are possible for download tests with a duration of less than 10 seconds. Therefore, the download file should be as large as possible (depending on the access speed). If the duration of the test is less than 10 seconds, the ARGUS does not display any data rate or time.

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28. See HTTP download for an explanation of the test parameters.

Starting FTP download

The service Data is started in the same way as for HTTP upload.

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Server Profiles	
<input checked="" type="radio"/>	Server Profile 1
<input type="radio"/>	Server Profile 2
<input type="radio"/>	Server Profile 3
<input type="radio"/>	Server Profile 4
<input type="radio"/>	Server Profile 5
<input type="radio"/>	Server Profile 6
<input type="radio"/>	Server Profile 7
<input type="radio"/>	Server Profile 8
<input type="radio"/>	Server Profile 9



Select FTP download

<Profile> Displays the available FTP download profiles.

Mark the server profile (default is indicated with ●).

The server profiles are also used for HTTP download, HTTP upload and FTP upload.

<Edit> Edits the marked profile, changes the individual settings.

FTP download starts automatically.

Test Overview

FTP Download ↑

Speed: 96,286 Mb/s

Progress: 2 %

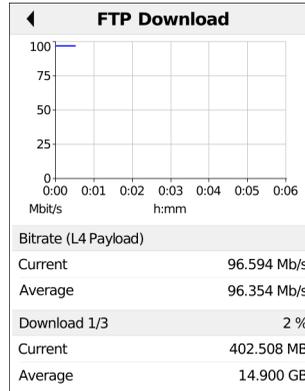
Filesize: 14,900 GB

Data VoIP IPTV Opt.

↓ 99,719 Mbit/s 2,221 Mbit/s ↑

V VDSL Net Data Rate ↓ 0 b/s ↑ 41,996 Mb/s

Retransmission: ↑ ↓ CRC: ↑ ↓ FEC: ↑ ↓



Current	80,337 MB
Overall	143,050 MB
Time	
Elapsed	00:00:04
Remaining	00:00:02
Parallel Downloads	
Current	3
Configured	3
Target	
URL	iptest.testnetz
IPv4	192.168.100.20
Used Version	IPv4

You can observe the running test in the test overview. You can access the long-term view (see images at right) via "Details".

Display during FTP download:

- Current download/total number of downloads
- Files already transferred (current/overall)
- Current net download rate
- Average download rate
- Currently transferred bytes
- Total file size to transfer
- Data transferred in test (current and total)

- Total data transferred
- Current download time in h:min:s
- Remaining transfer time
- Number of parallel downloads

<New> Select a new single test.
<Stop> Stop the FTP download test.
<Detail> Open the long-term view.

For saving results, see IP ping, page 91.

11.9 FTP upload

In FTP upload, the ARGUS sends the data of a file to a server. The ARGUS displays the current net upload rate, the usable data of the IP packets, and following conclusion of test, the average net speed (for multiple download attempts).



No meaningful evaluations are possible for upload tests with a duration of less than 10 seconds. Therefore, the upload file should be as large as possible (depending on the access speed). If the duration of the test is less than 10 seconds, the ARGUS does not display any data rate or time.

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28. See HTTP download for an explanation of the test parameters.

Starting FTP upload

The service Data is started in the same way as for HTTP upload.

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1

Server Profiles	
<input checked="" type="radio"/>	Server Profile 1
<input type="radio"/>	Server Profile 2
<input type="radio"/>	Server Profile 3
<input type="radio"/>	Server Profile 4
<input type="radio"/>	Server Profile 5
<input type="radio"/>	Server Profile 6
<input type="radio"/>	Server Profile 7
<input type="radio"/>	Server Profile 8
<input type="radio"/>	Server Profile 9



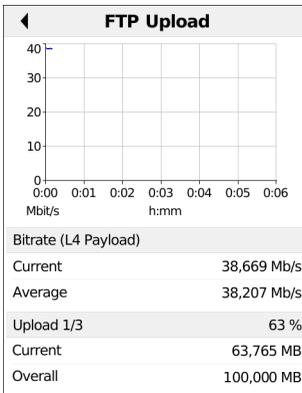
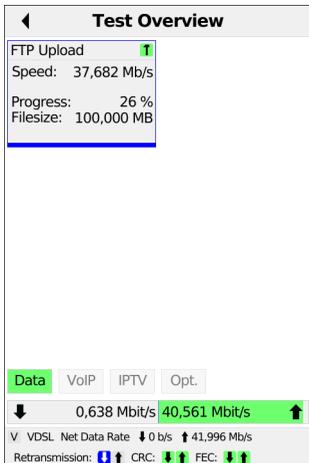
Select FTP upload

<Profile> Displays the available FTP upload profiles.

Mark the server profile (default is indicated with ●).
The server profiles are also used for HTTP download, HTTP upload and FTP download.

<Edit> Edits the marked profile, changes the individual settings.

FTP upload starts automatically.



Overall	24 %
Current	72,954 MB
Overall	300,000 MB
Time	
Elapsed	00:00:16
Remaining	00:00:05
Parallel Uploads	
Current	1
Configured	1
Target	
URL	iptest.testnetz
IPv4	192.168.100.20
Used Version	IPv4

You can observe the running test in the test overview. You can access the long-term view (see images at right) via “Details”.

Display during FTP upload:

- Current upload
- Data already transferred (current/total)
- Current net upload rate
- Average net upload rate
- Currently transferred bytes
- Total file size
- Data transferred
- Total data to be transferred

- Current upload time in h:min:s
- Remaining transfer time

<New> Selects a new single test.
<Stop> Stops the HTTP upload test.
<Detail> Opens the long-term view.

For saving results, see IP ping, page 91.

11.10 FTP server

In FTP server mode, the ARGUS behaves like a server for FTP requests. In this mode, the ARGUS serves FTP download and FTP upload requests.

These requests can be sent from a second terminal device (e.g. another ARGUS unit) via an xDSL or Ethernet access.

This makes it possible to test end-to-end throughput and determine the maximum possible data rate for this access.

In the following, the throughput test is explained using the Ethernet interface as an example. This example uses two ARGUS units: one as the FTP, one to send the FTP download request.

ARGUS 1 - FTP server

No settings need to be configured on the ARGUS used as the FTP server. The FTP server test just needs to be started on the selected interface.

Starting FTP server (example: Ethernet, already active)

The service Data is started in the same way as for HTTP upload.

Single Tests	
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info

FTP Server	
Status	
Status	Active
IPv4	10.5.100.188
Port	21

The ARGUS uses the IP address configured under "own IP address" as the destination address (server) for the second ARGUS unit.

ARGUS 1 now waits for an FTP request from a second terminal device (in this example the 2nd ARGUS instrument).

The IP mode in this example is "static", the default IP netmask configuration is used.

ARGUS 2 - FTP down/upload

In principle, you can adopt the same configuration for the ARGUS unit sending the FTP request (FTP download in this example) as in an FTP download test.

The netmask and IP address (IP mode: static) should match the settings on ARGUS 1.

Starting FTP download:

The service Data is started in the same way as for HTTP upload.

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1

Server Profiles	
<input checked="" type="radio"/>	Server Profile 1
<input type="radio"/>	Server Profile 2
<input type="radio"/>	Server Profile 3
<input type="radio"/>	Server Profile 4
<input type="radio"/>	Server Profile 5
<input type="radio"/>	Server Profile 6
<input type="radio"/>	Server Profile 7
<input type="radio"/>	Server Profile 8
<input type="radio"/>	Server Profile 9



Select FTP download

<Profile> Displays the available FTP download profiles.

Mark the server profile (default is indicated with ●).

The server profiles are also used for HTTP download, HTTP upload and FTP download.

<Edit> Edits the marked profile, changes the individual settings.

Server Profile	
Server Address	192.168.178.5
FTP Port	21
Download Filename	file
Upload Filename	file
Upload Filesize	100 MByte
Username	[Empty]
Password	[Empty]
Number of Up-/Downloads	1
Number of Parallel Downloads	3

Number of Parallel Uploads	1
Profile Name	Serverprofil 1



You can obtain further information on settings in the ARGUSpedia on the instrument.

Only enter the address of ARGUS 1 in the server profile of ARGUS 2 as the server IP address.

In this case too, the download file name is the size of file to be downloaded.



No meaningful evaluations are possible for download tests with a duration of less than 10 seconds. Therefore, the upload file should be as large as possible (depending on the access speed). If the duration of the test is less than 10 seconds, the ARGUS does not display any data rate or time.

See page 111 for displaying the FTP download result during the FTP download.

11.11 Web browser

The web browser can display HTML web pages.

Protocol-independent parameters:

Opening of test parameters is described in the chapter "Configuring accesses", see page 28.

<Setting> The address can be entered as either an IP number or a name (URL).
Default: ***www.argus.info***

Starting the web browser

The service Data is started in the same way as for HTTP upload.

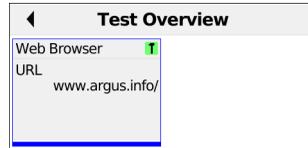
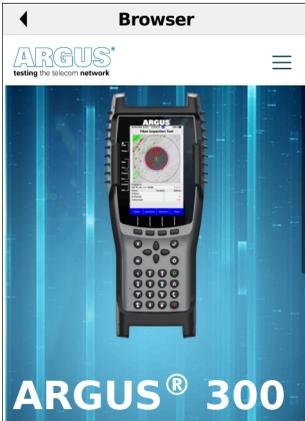


Select the web browser.

Select the URL.

You can configure up to 20 URLs; see "Access name", page 31 for instructions.

If no connection is established, ARGUS automatically connects at this point (see page 40).



The selected website opens (see image at left). You can view the destination URL in the test overview.

- <New> Selects a new single test.
- <Stop> Cancels the web browser.

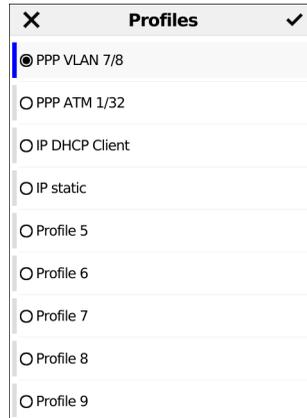
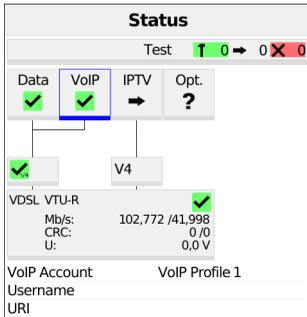
Saving web browser result see also IP ping (see page 91).

12 VoIP tests

The ARGUS operates as a VoIP terminal device with active acoustics, enabling voice links. Session Initiation Protocol (SIP) is available as a VoIP signalling protocol. Calls can be established both with and without registrar/proxy. The ARGUS can be used to establish VoIP connections (DSL telephony) via xDSL, G.fast and Ethernet. To assess voice quality, the ARGUS determines and displays the MOS/R-factor and the RTP datastream.

You can configure ten VoIP "accounts" (profiles):

Protocol-independent parameters:



The ARGUS status screen (see image at left).

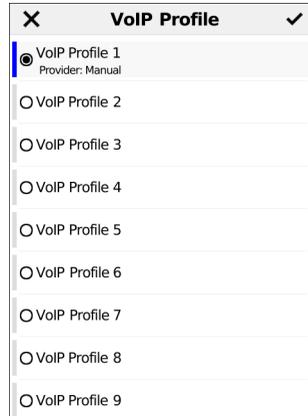
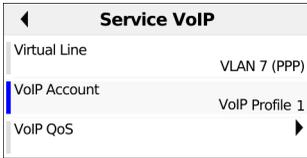
- <Edit> Assigns a virtual line to the service VoIP.
- <Profile> Profile settings, see page 33.
- <Start> Activates the service.



Select the profile you wish to edit (see image at right). The selected profile appears in the display in blue. The default profile is indicated with a ● in the display. The ARGUS adopts the parameters from the default profiles for establishing the Ethernet, G.fast or xDSL connection and conducting the VoIP test.



The ARGUS uses the marked profile as the preset profile and switches to the menu Settings.



The "Edit" softkey takes you to the Service VoIP menu (see picture on the left). Once you have selected the option VoIP account, you can edit the VoIP profiles (see image at right). A total of ten user-defined VoIP profiles are available.

<Edit> Edits the VoIP profile (see image at left).



You first need to decide whether you want to configure this using the wizard or manually.



The wizard only prompts for a subset of all configuration settings.

The following test parameters can be configured for the VoIP account:

- VoIP
 - Provider Assistant
- Manual Configuration
 - SIP
 - User name
 - Password
 - Authentication
 - Caller ID

- Registrar Server
- Outbound Proxy / SBS
- DNS resolution
- SIP trunk
 - Trunk used
 - CLIR
 - own trunk number
 - own direct dial-in (DDI)
- Transport protocol
- SIP domain
- Listen port
- Remote port
- User agent
- Qualify
- Reg. expire
- Retry-after
- Delete current registration
- Telephone setup
 - RTP port range
 - Silence detection
 - Jitter buffer
 - Codecs
 - DTMF settings
- STUN server
 - STUN used
 - STUN server
- Rated / threshold values
 - MOS rated value
 - Jitter threshold
 - RTP loss threshold
- Profile name

You can configure the following settings for VoIP QoS (quality of service):

- Layer 3 DiffServ
 - RTP (ToS/DSCP)
 - SIP (ToS/DSCP)
- Layer 2 VLAN Prio
 - RTP VLAN Prio
 - SIP VLAN Prio



You can obtain further information on settings in the ARGUSpedia on the instrument.

12.1 Starting VoIP telephony

(Example: VDSL access, already active)

Status	
Test 1 0 → 0 X 0	
Data →	VoIP →
IPTV →	Opt. ?
V4	V4
VDSL VTU-R ✓	
Mb/s:	102,772 /41,998
CRC:	0 /0
U:	0,0 V
VoIP Account	VoIP Profile 1
Username	
Authentication	
Transport Protocol	TCP Fallback
SIP Domain	
SIP Trunk	No

Status	
Test 1 0 → 0 X 0	
Data ✓	VoIP ✓
IPTV →	Opt. ?
✓	V4
VDSL VTU-R ✓	
Mb/s:	102,772 /41,998
CRC:	0 /0
U:	0,0 V
VoIP Account	VoIP Profile 1
Username	
URI	

Connecting the service.

The profile selected for xDSL connection is also used for VoIP telephony.

<Edit> Edits the default virtual line profile.



The service VoIP is greyed out when the VoIP option is not set.

If no xDSL or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

<Info> Duration of activation, see page 129.

<Test> Opens test selection.

<Stop> Deactivates the service.

Single Tests	
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	www.argus.info
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info
VoIP Call	89

VoIP Destinations
<input type="radio"/> 0235190700
<input checked="" type="radio"/> 89
<input type="radio"/>



Select VoIP call.

Marks the VoIP destination (default is indicated with ●).

Scroll down with the cursor, mark a blank line and add a new VoIP destination using <Edit>.

<Edit> Edits the VoIP number.

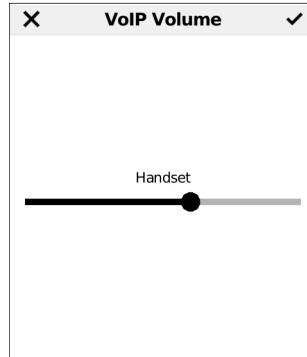
VoIP Overview	
Status	
State	---
Call Info	Connected
From	7089
To	89
Connecting Time	00:00:00
Codec	Unknown

Test Overview	
VoIP	<< 1
Outgoing To	89
MOS:	4,3
jitter:	0 ms

Connecting.

The ARGUS displays its "own number" (from: 7089) and the number of the called subscriber (to: 89). The called subscriber has not yet accepted the call: call info "Connected" and yellow telephone handset symbol.

VoIP Overview		
Status		
State	Ok	
Call Info	Outgoing Call	
From	7089	
To	89	
Connecting Time	00:00:11	
Codec	G.711 A-law	
Overview	Tx	Rx
MOS (G.107)	4,3	4,3
Jitter	0 ms	0 ms
LOSS	0,00 %	0,00 %
VLAN (Priority)	---	---
ToS	00 _{hex}	B8 _{hex}



The called subscriber has accepted the call (status "OK" and green check mark). The ARGUS determines the MOS value and displays whether the voice quality attains the target MOS voice quality value (see page 216) ("OK" or "FAIL"). The ARGUS also displays the classification of the MOS value according to ITU-T P.800 (in this example "good"). The duration of the call and the currently used voice codec (in this example G.711 A-law) are additionally displayed along with the RTP loss rate.

VoIP overview display (for transmitted and received packets including assessment)

- Status
- MOS value (FAR-MOS/MOS)
- Jitter in ms
- RTP loss rate
- VLAN (Prio) in hexadecimal
- TOS (hex) in hexadecimal



The FAR-MOS value is only displayed when the remote station supports RTCP.

See page 206 for the meanings of the symbols displayed.

- <Detail> Displays the VoIP parameters
- <Volume> Opens the volume control

MOS Info		
MOS (G.107)	Tx	Rx
Current	4,3	4,3
Average	4,3	4,3
Minimum	4,3	4,3
Maximum	4,3	4,3
Ideal	4,3	4,3
R-Factor	Tx	Rx
Current	91	90
Average	91	90

RTP Info	
Packets	
Received	1551
Sent	1549
Error Counter	
RTP Drop	0
RTP Error	0
RTP Jitter Rx	
Current	0 ms
Average	0 ms
Minimum	0 ms
Maximum	1 ms

RTP Packet Loss Rx	
Current	0,00 %
Average	0,00 %
Minimum	0,00 %
Maximum	0,00 %
Total	0

Display of MOS info (for transmitted and received packets):

- Current MOS
- Average MOS
- Min./max. MOS value
- Ideal MOS (possible MOS without interference, codec-dependent)

Display of further VoIP results:

Packet statistics:

- Received packets (Rx)
- Transmitted packets (Tx)
- Error counter:
 - RTP drop
 - RTP error
- RTP jitter Rx:
 - Current jitter
 - Average jitter
 - Minimum jitter
 - Maximum jitter
- Lost RTP packets (Rx)
 - Current, average, min. and max., total

RTCP content

Displays the statistics returned by the remote station.

- Current jitter of remote station Rx (far)
- Average jitter at remote station
- Maximum and minimum jitter of remote station
- Lost RTP packets at remote station
 - Rx (far): Total, current, average, min. and max.

- Network delay calculated from the transmission time of RTCP packets: current, average, min. and max.



If the message "no data" appears, that means that the remote station does not support RTCP.

VoIP Codec	
Codec	
G.711 A-law	
G.711 μ-law	

QoS Info		
QoS Information		
VLAN ID	---	---
VLAN Priority RTP	---	---
VLAN Priority SIP	---	---
RTP TOS	00 _{hex}	B8 _{hex}
SIP TOS	00 _{hex}	---

The ARGUS displays the available codecs of the remote station.

Display of QoS info (for transmitted and received packets including assessment)

- VLAN ID
- VLAN Prio RTP
- VLAN Prio SIP
- RTP ToS in hexadecimal
- SIP ToS in hexadecimal

Status	
Test ↑ 0 → 0 X 0	
Data <input checked="" type="checkbox"/>	VoIP <input checked="" type="checkbox"/>
IPTV <input type="checkbox"/>	Opt. <input type="checkbox"/>
V4	
VDSL VTU-R	<input checked="" type="checkbox"/>
Mb/s:	102,772 /41,998
CRC:	0,0
U:	0,0 V
VoIP Account	VoIP Profile 1
Username	
URI	

Service VoIP	
Active	00:00:11
Profile	VoIP Profile 1
Protocol	SIP
Username	7089

When you select "Info" in the status screen, the ARGUS displays the duration of the active VoIP service, the protocol used and the user name.

<SIP> Displays registration details: status codes, registrar IP, registrar used, outbound proxy/SBC and URI used and more.

<Log.> Displays the VoIP service SIP commands, see page 130.

Service VoIP		
	Info	Time
>	SIP Register	12:08:00:000
<	401 Unauthorized	12:08:00:090
>	SIP Register	12:08:00:190
<	200 Ok	12:08:00:350
>	SIP Register	12:08:00:560
<	401 Unauthorized	12:08:00:920
>	SIP Register	12:08:01:250
<	SIP Options	12:08:01:670
>	200 Ok	12:08:02:090
<	200 Ok	12:08:02:560

Service VoIP	
Register State	Registered
SIP Code	Ok
Registrar	
URL	_sip_udp.ipptest.testnetz
DNS Resolution	
IPv4	192.168.100.20
Received Reg.	192.168.100.20
URI	sip:7089@ipptest.testnetz
Realm	ipptest.testnetz

Before, during and after the connection, the ARGUS displays the registration details. The setting "Use registrar" must be set to "yes" (see image at left).

The ARGUS displays the SIP commands in the service VoIP (see image at right). A timestamp is added for all events.



The timestamp is generated using the ARGUS-internal system time.

For further information, see page 212 "Software licenses".

Incoming call:

VoIP Overview	
Status	
State	---
Call Info	Connected
From	7089
To	89
Connecting Time	00:00:00
Codec	Unknown

The ARGUS can be called while the service VoIP is active. An incoming call is indicated by the yellow CALL symbol. The call can be accepted or refused. For automatic call acceptance, you need to start the specific test "VoIP call acceptance", see page 133.

- <Refuse> Refuses the call. Switches to status screen.
- <Accept> Accepts the call. Switches to ARGUS status.

VoIP results

You can obtain further information on the VoIP results in the ARGUSpedia on the instrument.

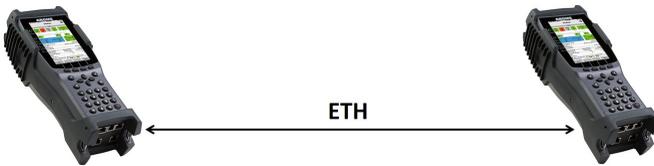
12.1.1 VoIP back-to-back

The ARGUS permits a VoIP call to a second terminal device, e.g. another ARGUS unit. To enable calling, both ARGUS instruments must be configured as follows:

	ARGUS 1	ARGUS 2
Access, see page 28	Ethernet IP-based	
Protocol	IP	
IP version	IPv4	
IP mode	Static IP	
Own IP address	In this example 10.0.0.1	In this example 10.0.0.2

ARGUS 1

ARGUS 2



Now enter the IP address of ARGUS 2 in ARGUS 1 as the target telephone number to initiate a VoIP call. The IP address of ARGUS 1 must be entered as the target telephone number in ARGUS 2.

The call is connected just as for VoIP call/VoIP call acceptance, see page 133.

12.2 VoIP Call Acceptance

In the test "VoIP Call Acceptance", the ARGUS behaves like a VoIP telephone. The VoIP call (see page 126) and the VoIP call acceptance parameters must be configured for the VoIP call acceptance test:

Status	
Test 1 0 → 0 X 0	
Data →	VoIP →
IPTV →	Opt. ?
V4	V4
VDSL VTU-R	✓
Mb/s:	102,772 /41,998
CRC:	0/0
U:	0,0V
VoIP Account	VoIP Profile 1
Username	
Authentication	
Transport Protocol	TCP fallback
SIP Domain	

Status	
Test 1 0 → 0 X 0	
Data ✓	VoIP ✓
IPTV →	Opt. ?
✓	V4
VDSL VTU-R	✓
Mb/s:	102,772 /41,998
CRC:	0/0
U:	0,0V
VoIP Account	VoIP Profile 1
Username	
URI	

Connecting the service.

The profile selected for connection (in this example profile 1) is also used for VoIP call acceptance.

<Edit> Edits the default virtual line profile.

If no xDSL, G.fast or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

Single Tests	
IP Ping	www.argus.info
Traceroute	www.argus.info
Path MTU	www.argus.info
VoIP Call	0235190700
VoIP Call Acceptance	Automatic
VoIP Call Generator	0235190700

Call Accept. Mode	
<input checked="" type="radio"/>	Automatic
<input type="radio"/>	Echo Test



Select VoIP Call Acceptance.

<Setting> Opens call acceptance mode for VoIP Call Acceptance.

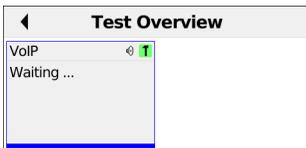
The test VoIP wait offers the following configuration options (see image bottom left):

- Automatic
- Echo test

Default: **Automatic**



The ARGUS uses the own number entered under SIP parameters (see page 130) as its own number.

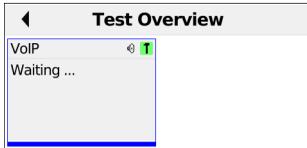


VoIP Overview	
Status	
State	---
Call Info	Connected
From	7089
To	89
Connecting Time	00:00:00
Codec	Unknown

The ARGUS waits for a VoIP call (see image left).

<Detail>

Opens further information (see image right).



 A screenshot of a software window titled "VoIP Overview". It has a back arrow icon in the top left corner. The window displays call details and performance metrics in a structured layout.

VoIP Overview		
Status		
State	Ok	
Call Info	Incoming Call	
From	89	
To	7089	
Connecting Time	00:00:10	
Codec	G.711 A-law	
Overview	Tx	Rx
MOS (G.107)	4,3	4,3
Jitter	0 ms	0 ms
LOSS	0,00 %	0,00 %
VLAN (Priority)	---	---
ToS	00 _{hex}	BB _{hex}

The ARGUS waiting for a VoIP call (see image at left).

The ARGUS automatically accepts the call (see Setting page 134) (see image at right). The connection parameters are the same as for VoIP call and are explained on page 126 and following.

Disconnecting:



The connection is terminated as for IP ping.

However, pressing "Cancel" initially only disconnects (if a connection existed). The ARGUS remains registered with the registrar (service VoIP active) and remains available for the caller (an incoming call can be refused or accepted). Deactivate the service VoIP to terminate registration. However, the established access remains active.

12.3 VoIP call generator

(Example: VDSL access, already active)

The profile selected for connection (in this example PPP VLAN 7/8) is also used for the VoIP call generator.

<Edit> Edits the default virtual line profile.



The service VoIP is greyed out when the VoIP option is not set.

If no xDSL, G.fast or Ethernet connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

<Info> Duration of activation, see page 129.

<Test> Opens test selection.

<Stop> Deactivates the service.



Selects VoIP call generator

Marks the VoIP destination
(default is indicated with ●).

Scroll down with the cursor, mark a blank line and add a new VoIP destination using <Edit>.

<Edit> Edits the VoIP number.

VoIP Call Generator	
Call 1	Connected
Call 2	Connected
Call 3	Connected
Call 4	Connected
Call 5	Connected
Call 6	Connected
Call 7	Connected
Call 8	Connected
Call 9	Connected
Call 10	Connected
Call 11	Connected
Call 12	Connected
Call 13	Connected
Call 14	Connected

Test Overview	
VoIP Call Generator	1
To:	89
Successful Calls	30

Up to 30 consecutive VoIP calls to a configured VoIP destination are established. The connection is maintained until the test is stopped.

As soon as a call is refused, the ARGUS stops establishing further calls. Existing calls remain connected. If the remote station hangs up a call, this is indicated for that call. The test remains active until you press the “Stop” softkey – even if the remote station has terminated all calls.

<Stop> Closes the call generator.

The number of successful calls is displayed. These are the calls that were still connected when the test was stopped. Calls that were refused or terminated by the remote station are not displayed.

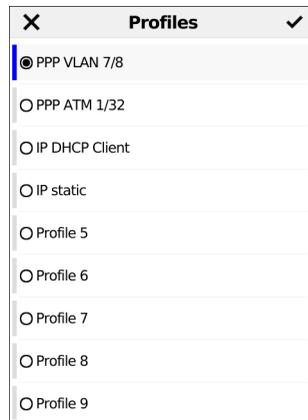
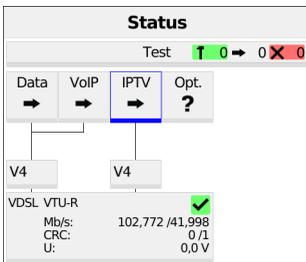
<Restart> Restarts the VoIP call generator.

13 IPTV tests

13.1 IPTV

The ARGUS requests a data stream from a server (depending on the access type, the ARGUS replaces the set-top box (STB) or modem plus STB) and checks the regularity of the incoming packets, packet loss and the switch-on/switch-over time of the program. You can configure three user-defined IPTV profiles (where the xDSL, G.fast or Ethernet connection is already established, the connection parameters, e.g. the target value, are locked):

Protocol-independent parameters:



The IPTV-STB emulation is realised using the service IPTV.

The following example illustrates the procedure and its special features.

<Edit> Assigns virtual lines to the service IPTV.

<Profile> Profile settings, see page 33.

<Start> Activates the service.



Select the profile you wish to edit. The selected profile appears in the display in blue. The default profile is indicated with a ● in the display. The ARGUS adopts the parameters from the default profiles for establishing the Ethernet, G.fast or xDSL connection and conducting the IPTV test.



The ARGUS uses the marked profile as the preset profile and switches to the menu setting.

Service IPTV	
Virtual Line	No VLAN (DHCP)
IPTV QoS	▶

Status															
Test ↑ 0 → 0 ✘ 0															
Data →	VoIP →	IPTV ✓	Opt. ?												
<table border="1"> <tr> <td>✓</td> <td>VDSL VTU-R</td> <td>✓</td> </tr> <tr> <td></td> <td>Mb/s:</td> <td>102,772 /41,998</td> </tr> <tr> <td></td> <td>CRC:</td> <td>0 /1</td> </tr> <tr> <td></td> <td>U:</td> <td>0,0 V</td> </tr> </table>				✓	VDSL VTU-R	✓		Mb/s:	102,772 /41,998		CRC:	0 /1		U:	0,0 V
✓	VDSL VTU-R	✓													
	Mb/s:	102,772 /41,998													
	CRC:	0 /1													
	U:	0,0 V													

Press the softkey "Edit" to configure the VL profile, then start the service IPTV.

Single Tests	
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info
VoIP Call	0235190700
VoIP Call Acceptance	Automatic
VoIP Call Generator	0235190700
IPTV	IPTV Profile 1
IPTV Zapping Test	IPTV Zapping Profile 1

IPTV Profile	
<input checked="" type="radio"/>	IPTV Profile 1
<input type="radio"/>	IPTV Profile 2
<input type="radio"/>	IPTV Profile 3

IPTV Test Param.	
Channel Selection	Das Erste
IGMP Version	3
Thresholds	▶
Profile Name	IPTV Profile 1

Now you can select a single test, e.g. IPTV. A total of three user-defined IPTV profiles are available (see image at right). You can edit and modify the marked parameters.

You can configure the following settings for IPTV:

- Channel selection
 - Multicast address
 - Port
 - Broadcaster name
- IP version
- limit values
 - IGMP latency
 - Sync error
 - PCR jitter
 - Error indication
 - CC error
 - CC error rate
 - Audio bytes
 - Video bytes
 - RTP jitter
 - RTP sequence error
 - Current RTP loss rate
 - Total RTP loss rate
- Profile name

You can configure the following settings for IPTV QoS (quality of service):

- Layer 3 DiffServ
 - RTP (ToS/DSCP)
- Layer 2 VLAN Prio
 - VLAN Prio



You can obtain further information on settings in the ARGUSpedia on the instrument.

13.1.1 Multiple virtual lines

The ARGUS can use up to 4 virtual lines for the service IPTV. The IGMP virtual lines are used for transmission of the IGMP protocol and virtual lines 1-3 for receiving the video/ audio streams.

✕	Virtual Line	✓
<input type="radio"/>	No Virtual Line	
<input type="radio"/>	PPP ATM 1/32	
<input type="radio"/>	VLAN 7 (PPP)	
<input type="radio"/>	VLAN 8 (DHCP)	
<input type="radio"/>	No VLAN (DHCP)	
<input type="radio"/>	No VLAN (IP static)	
<input checked="" type="radio"/>	intec VL PPP	
<input type="radio"/>	Virt. Profile 7	
<input type="radio"/>	Virt. Profile 8	

✕	Virtual Line	✓
IGMP VL: intec VL PPP		
VL 1:	No VL	

<Edit> Edits the selected virt. profile (in this example virt. profile 1).

<More VLS> Opens virtual line selection for the service IPTV.

<Insert> Inserts further virtual profiles.

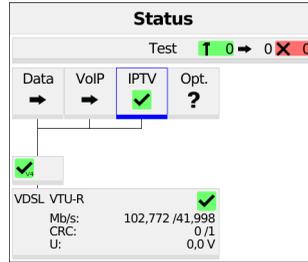
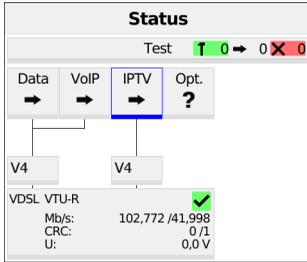
✕	Virtual Line	✓
	PPP ATM 1/32	
	VLAN 7 (PPP)	
	VLAN 8 (DHCP)	
	No VLAN (DHCP)	
	No VLAN (IP static)	
	Virt. Profile 7	
	Virt. Profile 8	
	Virt. Profile 9	
	Virt. Profil 10	

✕	Virtual Line	✓
IGMP VL: intec VL PPP		
VL 1:	Virt. Profile 7	
VL 2:	No VL	

Adds selected VL profile for the service IPTV.

- <Insert> Inserts a further virtual profile.
- <Edit> Edits the selected virtual profile (in this example profile 3).
- <More> Opens further selection options.
- <Delete> Deletes the selected virtual profile (in this example profile 3).
- <↓> The marked profile is moved down one place in the list.
- <↑> The marked profile is moved up one place in the list.

Starting IPTV



Connecting the service.

The profile selected for xDSL connection is also used for IPTV.

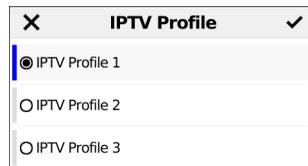
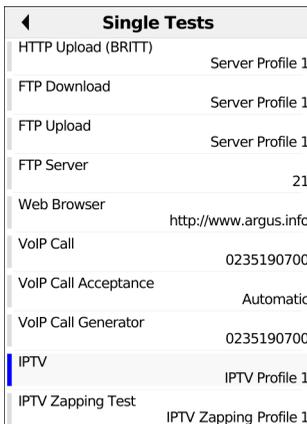
<Edit> Assigns a virtual line is assigned to the service IPTV or edits it.

If no xDSL connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

<Info> Activation duration

<Test> Opens test selection

<Stop> Deactivates the service



<Profile> Displays the IPTV profiles, see page 147.

IPTV test

Test Overview	
IPTV	1
Das Erste	
Bitrate:	3,415 Mb/s
Loss:	0
Rate:	0,00 %

IPTV	
Bitrate	
Current	3,390 Mb/s
Packet Loss	
Sum	0
Packet Loss Rate	
Average	0,00 %
Delay Factor	
Current	9 ms
Minimum	8 ms
Maximum	18 ms
Average	11 ms
Media Loss Ratio	
Sum	0,00000 %

During the test, the ARGUS displays the selected IPTV channel, the duration of the test and the current bitrate. If the set limits are exceeded, the IPTV test shows "FAIL" in the display, otherwise "OK".

The ARGUS displays "FAIL" until the values fall below the threshold again.

<Channel> Selects a new channel.

<Test status> Displays test status without ending the test or starting a new test, see page 155.

<Total> Displays all IPTV statistics.



Cancels test.

Display:

- Current bitrate
- Number of packets lost during the test
- Display of packet loss rate in percent
- Display of delay (current, minimum, maximum, average)
- Display of media loss rate



The IPTV test runs until a new channel is selected.

<OK/FAIL> OK/FAIL overview of the IPTV test..

IPTV Ok/Fail		
IPTV Ok/Fail		
Current Loss Rate	0,00	Ok
Full Loss Rate	0,00	Ok
Sequential Error	0	Ok
RTP Jitter	-	Ok
Latency	36	Ok
Audio Bytes	24472	Ok
Video Bytes	281152	Ok
Sync Errors	0	Ok
Error Indications	0	Ok
PCR Jitter	1	Ok
CC Error	0	Ok
CC Error Rate	0,00	Ok

Display:

- Current loss rate in %
- Total loss rate in %
- Sequence errors
- RTP jitter
- Latency (in ms)
- Audio bytes (in Byte)
- Video bytes (in Byte)
- Sync error
- Error indication
- PCR jitter (in ms)
- CC errors
- CC error rate (in %)

IPTV-Ergebnisse



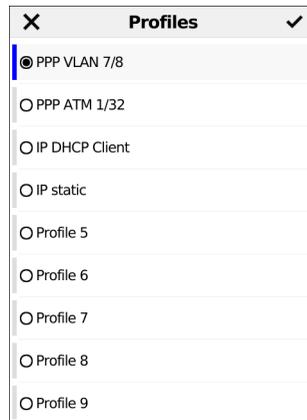
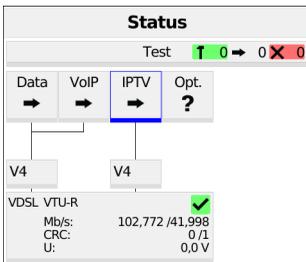
You can obtain further information on IPTV results in the ARGUSpedia on the instrument.

13.2 IPTV Zapping Test

The ARGUS checks the availability of TV channels. Additionally, the ARGUS displays the switchover time between TV channels.

You can create three user-defined scan profiles. The following settings must be saved in the profile for the IPTV zapping test (when the xDSL, G.fast or Ethernet connection is already established, the connection parameters, e.g. target value, are locked):

Protocol-independent parameters:



<Edit> Assigns virtual lines to the service IPTV.

<Profile> Profile settings, see page 33.

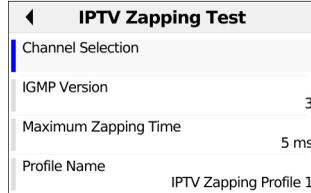
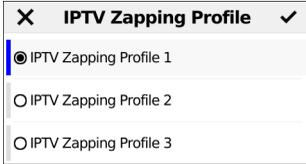
<Start> Starts the service.



Select the profile you wish to edit. The selected profile appears in the display in blue. The default profile is indicated with a ● in the display. The ARGUS adopts the parameters from the default profiles for establishing the Ethernet, G.fast or xDSL connection and conducting the IPTV scan.

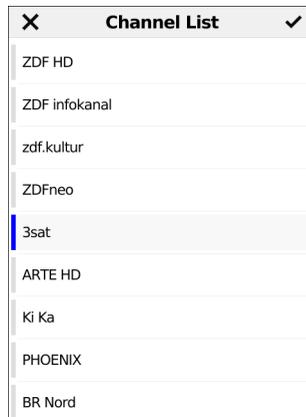
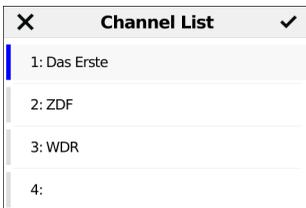


The ARGUS uses the marked profile as the preset profile and switches to the menu setting.



A total of three user-defined zapping profiles are available.

<Edit> Edits the marked zapping profile.



In the channel selection menu, the ARGUS initially displays the TV channels already selected in the set order that was tested for the IPTV zapping test. If no channels have been selected yet, the list is empty.

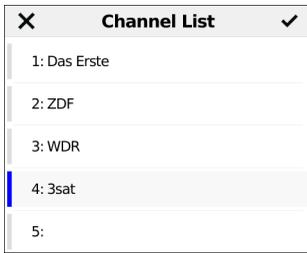
The list slots can be filled one after another. You can select up to 250 channels.

<Insert> Opens the channel list with the available channels.



Marks the channel
Channels already selected do not appear in the channel list (see image at right).

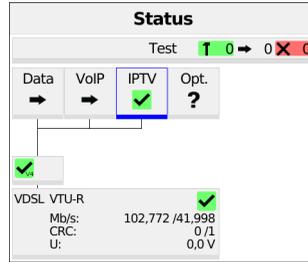
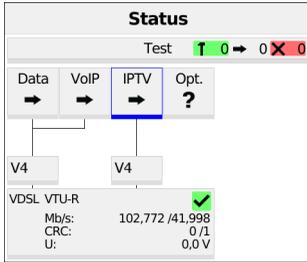
<Edit> Edits the marked channel:
- Enter the address (multicast IP and port number) of the TV channel.
- Enter any alias name for the TV channel (e.g. name of broadcaster).



Add the marked TV channel (in this example 3sat), then add the next channel. If at least two channels have been added to the list, you can change their position in the list using the following softkeys:

- <Delete> Deletes the marked TV channel from the selection list.
- <Insert> Opens the channel list with the available channels.
- <↓> Moves the marked channel down one place in the list.
- <↑> Moves the marked channel up one place in the list.

Starting the IPTV zapping test



Connecting the service.

The profile selected for xDSL connection is also used for IPTV..

<Edit> Assigns a virtual line to the service IPTV or edits it.

Activating the service IPTV.

If no xDSL connection is established, the ARGUS automatically connects at this point using the default profile (see page 40).

<Info> Duration of activation

<Test> Opens test selection

<Stop> Deactivates the service

Single Tests	
FTP Upload (BKII)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info
VoIP Call	0235190700
VoIP Call Acceptance	Automatic
VoIP Call Generator	0235190700
IPTV	IPTV Profile 1
IPTV Zapping Test	IPTV Zapping Profile 1

<Profile> Displays the IPTV zapping test profiles, see page 147.

Test Overview	
IPTV Zapping Test	▶
Current Channel	
Das Erste	
Last Channel	
3SAT:	47 ms

IPTV Zapping Test	
Zapping Time	
Minimum	16 ms
Maximum	47 ms
Average	30 ms

The IPTV zapping test starts automatically.

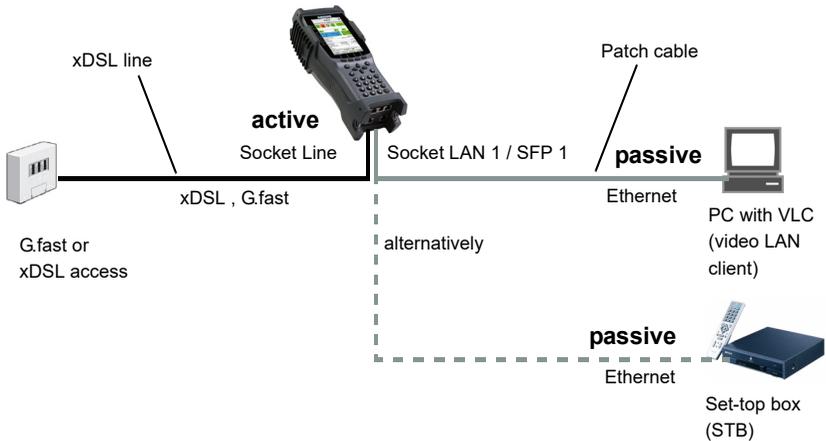
Displays the time needed to switch between channels. If a TV channel cannot be received within the set interval, the ARGUS displays "Failed".

`<Test status>` Displays test status without ending the test or starting a new test, see page 155.

For saving results, see IP ping, page 91.

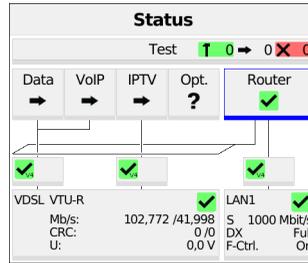
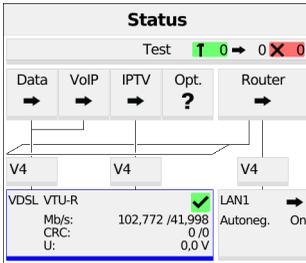
13.3 IPTV Monitor

ARGUS checks for transmitted TV channels without requesting a channel. ARGUS lists the TV channels it detects in a list of multicast IPs and/or channel names.



A second ARGUS in STB mode can be connected in place of a PC or STB.

Starting IPTV Monitor



Aufbau des Services.

Connecting the service.

The profile shown in the display is used for the IPTV Monitor.



IPTV Monitor can also be run in bridge mode. However, the bridge must be activated first.

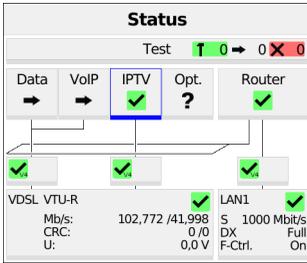
Use the cursor to select the router and start it.

Router mode is started (see picture on the right).

<Info> The duration of router activity is displayed.

<stop> Stops router mode.

Use the cursor to select and activate the IPTV service.



Single Tests

FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info
VoIP Call	89
VoIP Call Acceptance	Automatic
VoIP Call Generator	89
IPTV	IPTV Profile 1
IPTV Zapping Test	IPTV Zapping Profile 1
IPTV Monitor	IPTV Profile 1

The service IPTV and the router mode are active and the VDSL access is synchronous.



To access the softkey **<Test>** in bridge mode, switch to the bridge box and activate it.

The services are not available in bridge mode.

<Profile> Displays the IPTV Monitor settings.

X IPTV Profile ✓

IPTV Profile 1

IPTV Profile 2

IPTV Profile 3

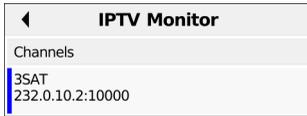
← IPTV

Waiting for stream ...

Marks the IPTV profile (default is indicated with ●).

<Edit> Edits the marked profile, changing of individual parameters.

ARGUS automatically checks whether IPTV streams are available and displays these.



In this example, one possible stream is displayed.

<Refresh>	Updates the channel list.
<Test status>	Displays test status without ending the test or starting a new test.
<IP>	Displays the multicast IP of the selected channel.

14 Parallel tests

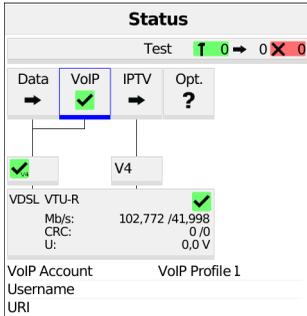
The ARGUS permits parallel testing of different IP-based services (data, VoIP, IPTV and opt.) running on xDSL, G.fast or Ethernet interfaces. The settings for each test are described in the respective chapters.

The following tests can be run in parallel. Any combination of the tests listed here is possible. Up to ten tests can be conducted concurrently.

Service	Test	Remark
Data	IP Ping* ¹ , see page 85	For these tests, up to 10 tests can be conducted concurrently (incl. tests using the other services).
	Traceroute* ¹ , see page 93	
	Path MTU, see page 96	
	iperf Client, see page 98	
	iperf Server, see page 101	
	ARGUS® Real Speed (RFC 6349), see page 103	
	Speedtest® by Ookla®	
	HTTP download, see page 105	
	FTP download, see page 110	
	FTP upload, see page 113	
	FTP server, see page 116	See remark for VoIP
Web browser, see page 119		
VoIP	VoIP call, see page 126	These tests can be combined with any other test. Please note that a total of ten simultaneous VoIP connections are possible.
	VoIP call acceptance, see page 133	
	VoIP call generator, see page 136	
IPTV	IPTV, see page 138	These tests can be combined with any other test. Note that only one IPTV test can be active at any time.
	IPTV zapping test, see page 146	
	IPTV monitor, see page 151	

Opt.	IP Ping* ¹ , see page 85	For these tests, up to 10 tests can be conducted concurrently (incl. tests using the other services).
	Traceroute* ¹ , see page 93	
	Path MTU, see page 96	
	iperf Client, see page 98	
	iperf Server, see page 101	
	ARGUS [®] Real Speed (RFC 6349), see page 103	
	Speedtest [®] by Ookla [®]	
	HTTP download, see page 105	
	FTP download, see page 110	
	FTP upload, see page 113	
	FTP server, see page 116	See remark for VoIP.
Web browser, see page 119		
	* ¹ Also possible via the services VoIP and IPTV	

The possibility of parallel testing is illustrated using HTTP download and VoIP via the services Data and VoIP. Display and operation for further parallel tests, e.g. IPTV, is performed in the same way as for Data and VoIP.



ARGUS status screen.

The VDSL VTU-R access shown in the example and the services Data and VoIP are active.

- <Info> Duration of activation.
- <Test> Opens test selection.
- <Stop> Deactivates the service.



Select e.g. HTTP download.

- <Profile> Displays the available HTTP download profiles.

14 Parallel tests

Server Profiles	
<input checked="" type="radio"/>	Server Profile 1
<input type="radio"/>	Server Profile 2
<input type="radio"/>	Server Profile 3
<input type="radio"/>	Server Profile 4
<input type="radio"/>	Server Profile 5
<input type="radio"/>	Server Profile 6
<input type="radio"/>	Server Profile 7
<input type="radio"/>	Server Profile 8
<input type="radio"/>	Server Profile 9

Single Tests	
iperf Client	www.argus.info
iperf Server	Version 3
ARGUS® Real Speed (RFC 6349)	
www.argus.info	
HTTP Download	Server Profile 1
HTTP Upload (BRITT)	Server Profile 1
FTP Download	Server Profile 1
FTP Upload	Server Profile 1
FTP Server	21
Web Browser	http://www.argus.info
VoIP Call	89

Mark the server profile:
(default is indicated with ●).

<Edit> Edits the marked profile, changes the individual parameters.

HTTP download starts automatically.

Display during HTTP download and test status: see “HTTP download” on page 105.



Select further test, e.g. VoIP call.

Test Overview	
HTTP Download ↑	VoIP ⊞ ↑
Speed: 94,201 Mb/s	Outgoing To 89
Progress: 24 %	MOS: 4,3
Filesize: 47,683 MB	Jitter: 0 ms
<div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> Data VoIP IPTV Opt. </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> ↓ 99,705 Mbit/s 2,052 Mbit/s ↑ </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> V VDSL Net Data Rate ↓ 102,772 Mb/s ↑ 41,998 Mb/s </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> Retransmission: ↑ ↑ CRC: ↑ ↑ FEC: ↑ ↑ </div>	

Test Overview	
HTTP Download ↑	VoIP →
Speed: 94,201 Mb/s	Hung Up
Progress: 24 %	Hang-up on near end
Filesize: 47,683 MB	
<div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> Data VoIP IPTV Opt. </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> ↓ 99,705 Mbit/s 2,052 Mbit/s ↑ </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> V VDSL Net Data Rate ↓ 102,772 Mb/s ↑ 41,998 Mb/s </div> <div style="display: flex; justify-content: space-between; border-top: 1px solid blue; border-bottom: 1px solid blue;"> Retransmission: ↑ ↑ CRC: ↑ ↑ FEC: ↑ ↑ </div>	

The ARGUS executes an HTTP download and a VoIP call in parallel.

When more than one test is executed, you can select the tests with the left and right cursor keys or by tapping the touchscreen.
 For more than six tests, the test rows expand downwards.

- <New>** Selects a new single test.
- <Stop>** Stops the test, in this example VoIP call. Depending on the test, you can subsequently re-initialise it with **<New>**. The configuration remains unchanged.
- >Details>** More information on the selected test.
- <Finish>** Deletes the selected test. Prior to this action, tests can be saved.

The VoIP call is stopped (see image at right).

15 Fiber

ARGUS enables a variety of tests at optical fiber interfaces (using the optical power meter and optical fault finder, among other tools).

15.1 Optical Power Meter

An optical power meter measures the optical performance of optical fibres (e.g. GPON) at various wavelengths. The power level is displayed live and can be stored in the device as a measurement protocol and QR code.

✕	Access	✓
<input type="radio"/>	VDSL	
<input type="radio"/>	G.fast	
<input type="radio"/>	SHDSL	
<input type="radio"/>	Ethernet	
<input type="radio"/>	WLAN (USB)	
<input type="radio"/>	GPON	
<input type="radio"/>	POTS	
<input type="radio"/>	Copper Tests	
<input checked="" type="radio"/>	Fiber	

✕	Fiber Mode	✓
<input checked="" type="radio"/>	Optical Power Meter	
<input type="radio"/>	Optical Fault Finder	
<input type="radio"/>	Fiber Inspection Tool	

✕	Interface	✓
<input checked="" type="radio"/>	SFP1	
<input type="radio"/>	USB	

Select new fiber access and then “Optical Power Meter”. You can now select either the USB or SFP1 interface.

In this example, the ARGUS® Optical Power Meter in SFP form factor is used.



The measurement starts as soon as the optical power meter is selected in the Access menu.

You can set different wavelengths using the arrow keys.



The Power Meter measures from -60 to +6 dBm the light power of different wavelengths in a range from 850 to 1625 nm.

15.2 Optical Fault Finder

The Optical Fault Finder lets you simply and rapidly detect optical faults, including clear text and distance indication. Only reflective events are measured. Up to 15 events can be detected in one test.

✕	Access	✓
<input type="radio"/>	VDSL	
<input type="radio"/>	G.fast	
<input type="radio"/>	SHDSL	
<input type="radio"/>	Ethernet	
<input type="radio"/>	WLAN (USB)	
<input type="radio"/>	GPON	
<input type="radio"/>	POTS	
<input type="radio"/>	Copper Tests	
<input checked="" type="radio"/>	Fiber	

✕	Fiber Mode	✓
<input type="radio"/>	Optical Power Meter	
<input checked="" type="radio"/>	Optical Fault Finder	
<input type="radio"/>	Fiber Inspection Tool	

✕	Interface	✓
<input checked="" type="radio"/>	SFP1	

Select new fiber access and then “Optical Fault Finder”. Then select interface SFP1.

Opt. Fault Finder	
Events	
1. Event	1.063 km
Optical Fault Finder SFP1	

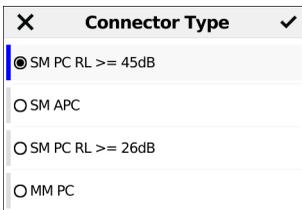
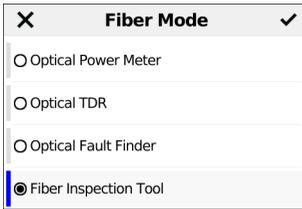
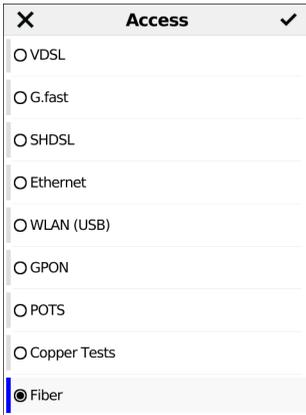
The test starts automatically when you select the access “Optical Fault Finder”. The results are shown together with the corresponding distance.



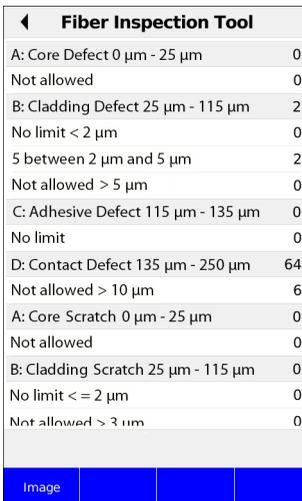
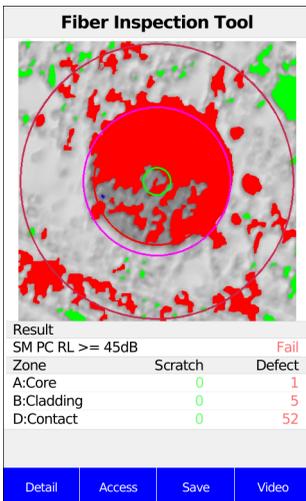
During detection, a dead zone of ≥ 30 m and an absolute accuracy of $\geq \pm 50$ m must be strictly observed.

15.3 Fiber Inspection Tool

The Fiber Inspection Tool (FIT) is a USB video microscope for optical fiber inspection that detects scratches and defects on optical fibers.



Select new fiber access and then Fiber Inspection Tool. Now select the connector type (here SM PC RL >= 45 dB).



If the Fiber Inspection tool is now selected in the access menu, the measurement starts immediately. The current video image is automatically analyzed and the number of defects and scratches is displayed in an overview table sorted by zones (core, cladding, adhesive, contact).

<Details> Detailed display of defects and scratches (see image on the right).



Pass/fail evaluation is performed according to IEC 61300-3-35. The minimum particle size is 0.5 μm .



There are different adapters (tips) available for PC, UPC, APC and more, ask our support.

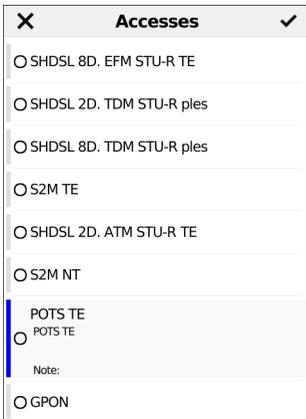
16 Operation on a POTS access



The voltages on the subscriber line may not exceed 130 VDC and should be free of AC voltage.

16.1 Setting the POTS Interface

Use the included connection cable to connect the ARGUS (Line jack) to the POTS access to be tested. The setting of the connection type is explained in the chapter Configuring accesses, see page 28. In this example the POTS TE mode was selected.



The following settings can be made for POTS:

- Dial Mode
- Clip Mode
- DTMF Parameters
 - Level
 - Time
 - Interval
 - Default settings
- Flash-Time

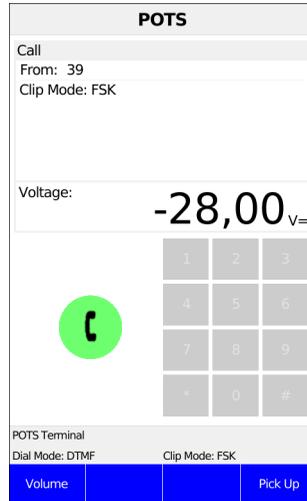
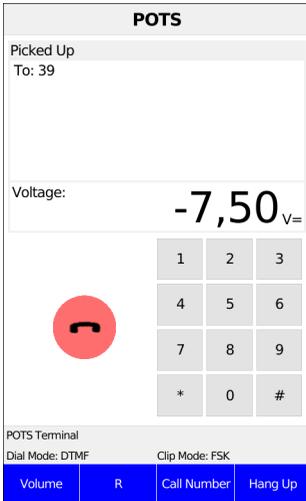


You can obtain further information on settings in the ARGUSpedia on the instrument.

16.2 Connection on a POTS access

Outgoing Calls

The ARGUS sets up a connection to another terminal. If the terminal at the other end is a telephone, the handset integrated in the ARGUS or a headset can be used to hold a conversation.



<Volume>

Volume setting.

<R>

Generating a FLASH signal.

<Call Number>

The ARGUS displays the last number dialed (redial) or that of the last caller.

<Accept> OR



Establishing a connection: Enter the phone number via the keypad. Each digit of the number is dialed individually. The ARGUS will display the dialed number. As soon as the remote party accepts the call, a speech connection is established.

Incoming Call

The ARGUS signals an incoming call both audibly and on the display (see picture on the right).

If the access supports CLIP, the ARGUS will display the number of the caller.

<Accept> or

Accept call.



The call number received will be saved in the “Last caller” memory location.

17 Operation on an ISDN Access



The voltages on the subscriber line may not exceed 48 V (BRI S/T) and should be free of AC voltage.

17.1 Setting the ISDN Interface and Access Mode

Connect the supplied connection cable (BRI S/T) to the ARGUS "Line" socket and your test connection.

Opening the test parameters is described in the chapter Configuring accesses (page 28).

In this example the ISDN TE mode was selected.

BRI	
Test 1 0 → 0 X 0	
ISDN BRI TE	B1 ✓ B2 ✓
Layer 3 DSS1	→
Layer 2 P-P (Point-To-Point)	✓
Layer 1 Slave	✓
Signal Level	
Ok	0.81 V
Line Voltage	
OK Normal	40.2 V=
L1 Status	
TE	Info 3
NT	Info 4
ISDN BRI TE P-P (Point-To-Point)	0.00 V
DSS1	0.0 V=
Setting	Access
Termination On	Start

Connection	
<input checked="" type="radio"/>	Overlap Sending
<input type="radio"/>	En-Bloc
<input type="radio"/>	Redialing Number
<input type="radio"/>	Last Caller

<Setting> Open the "ISDN BRI S/T settings" menu.

<Access> Switch to the connection menu.

<Termination on> Switch the termination on or off.

<Start> Repeat the B channel test.

After selecting "Test" one of the shown connections can be selected (see picture on the right).

The following settings can be made for BRI S/T:

- L1 permanent?
- Alerting mode
- BRI termination



You can obtain further information on settings in the ARGUSpedia on the instrument.

17.2 Initialization phase followed by a B channel Test

Initialization on a BRI S/T access

The ARGUS will begin the initialization after taking over the existing, confirmed settings or new settings for the type of access and mode. Next the ARGUS will setup Layer 1. While it is setting up Layer 1, the "Sync 1" LED above the display will blink. If the ARGUS cannot setup Layer 1, it will display the message "No net". As soon as Layer 1 is successfully setup, the "Sync 1" LED will light continuously.

If everything has been detected without errors, the ARGUS will display the type and mode of access found. Additionally, a qualitative assessment of the level will be displayed.

The ARGUS will automatically determine the protocol (in both TE and NT mode) or use the protocol set manually (see page 19 protocol). On a bilingual access, the ARGUS will use the DSS1 protocol.

The "Protocol" LED will light after the ARGUS has set up Layer 3. At the same time the ARGUS will start a B channel test and then display the results. If an error occurs in the B channel test (e.g. access is not plugged-in), the ARGUS will display an error message.

17.3 Service check

The ARGUS checks, which of the following services are supported by the access under test:

X	Service	✓
<input type="radio"/>	Speech	
<input type="radio"/>	UDI 64 kBit	
<input type="radio"/>	3.1 kHz Audio	
<input type="radio"/>	7 kHz Audio	
<input type="radio"/>	UDI-TA	
<input checked="" type="radio"/>	Telephony ISDN	
<input type="radio"/>	Fax G3	
<input type="radio"/>	Fax G4	
<input type="radio"/>	Mixed Mode	

X	B Channel	✓																								
<input type="text" value="*"/>																										
Please enter a value between 1 and 2 (* = Automatic)																										
<table border="1"> <tbody> <tr> <td>1</td><td>2</td><td>3</td><td>A</td><td>B</td><td>C</td> </tr> <tr> <td>4</td><td>5</td><td>6</td><td>D</td><td>E</td><td>F</td> </tr> <tr> <td>7</td><td>8</td><td>9</td><td>:</td><td>-</td><td><X></td> </tr> <tr> <td>*</td><td>0</td><td>#</td><td>.</td><td>ABC</td><td>✓</td> </tr> </tbody> </table>			1	2	3	A	B	C	4	5	6	D	E	F	7	8	9	:	-	<X>	*	0	#	.	ABC	✓
1	2	3	A	B	C																					
4	5	6	D	E	F																					
7	8	9	:	-	<X>																					
*	0	#	.	ABC	✓																					

The test runs automatically. The ARGUS will make a separate self call to test each of the user-specific services. However, the call will not be answered.

Enter the own (local) number of the access under test or select it from the speed-dialling memory.

The ARGUS suggests the B channel used last. If you enter an "*", the ARGUS will choose any B channel that is free.



There are PBXs that use separate call numbers for incoming and outgoing calls. In this case, for the Service tests, you can enter a "remote" call number that does not match the "own" number that is stored in the ARGUS. If the Service check should extend outside of the local exchange, it is possible to perform the Service check in an end-to-end mode. In this case, you must enter the remote call number for a second terminal device. The ARGUS will then automatically check whether the remote terminal can accept the call under the various services – in other words, whether it is "compatible" with these services.

Overlap sending (outgoing call)

In overlap sending, the digits entered for the call number are sent individually.

← Connection	
Service	Telephony ISDN
B Channel	1
From	
To	
CR Value	5
Length/Flag	1/1

1	2	3
4	5	6
7	8	9
*	0	#

← Call Clearing	
Active Clearing	
Location	User
CR Value	5
Length/Flag	1/1

Enter phone number via keypad.



Simplified individual dialing via the telephone key



The ARGUS will go directly to the Connection/Single Dial window regardless of the menu that is currently open.

The exchange tone sounds, after entering the phone number the connection is established.

En-bloc sending (outgoing call)

In en-bloc sending, the ARGUS sends the entire dialling information in one block.

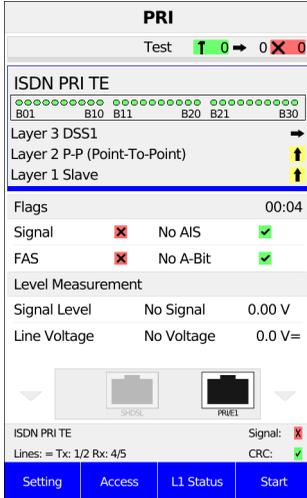
Redialling (outgoing call) + Last caller (incoming call)

The ARGUS will set up a call using the last number dialled or the number of the last caller.

18 Operation on a PRI Access

18.1 Configuring the PRI Interface and Access Mode Settings

Use the included connection cable to connect the ARGUS "PRI/EI" jack to the access to be tested. In this example the PRI TE mode was selected.



<Setting> Switch to the "PRI setting" menu.

<Access> Switch to the connection menu.

<L1 status> Open L1 status.

<Start> Start B-channel test.

The following settings can be made for PRI:

- Alerting mode
- PRI termination
- Sensitivity
- Sa5 bits
- Sa6 bits
- A-Bit
- CRC4 mode



You can obtain further information on settings in the ARGUSpedia on the instrument.

18.2 Initialization Phase including B-Channel Test

Initialization on a PRI network

As soon as Layer 1 is setup, the "Sync 1" LED will light continuously. The ARGUS will automatically determine and display, whether or not the PRI access uses CRC4-monitoring. CRC4 monitoring can be switched on or off manually.

The ARGUS will begin to automatically determine the access configuration. After Layer 2 is set up, the "Protocol" LED will also light. The ARGUS will, regardless of the mode of operation (TE or NT mode), determine the D-channel protocol and attempt to set up Layer 3.

During this phase, the ARGUS displays the A bit of the remote side and the FAS. The protocol can only be determined when the A bit is not set. The FAS (Frame Alignment Signal) indicates whether the ARGUS could correctly synchronize with the incoming 2 Mbit data stream's alternating frame identification word or message word and the, perhaps present, CRC4-superframe structure.

Press the <start> softkey to have the ARGUS begin to test the availability of all 30 B-channels one after the other by occupy the B-channels. If the ARGUS can place a call on a B-channel, it will be assumed that the B-channel is available in both directions; the B-channel test cannot distinguish between alternating and exclusively "outgoing" B-channels. If the connection is rejected, the B-channel will be identified as unavailable. In the case of a cause, which indicates that the B-channel is occupied, the connection will be tried up to two times and, if a connection can still not be setup, it will then be marked as unavailable.

18.3 The L1 Status of a PRI Access

The ARGUS displays the Layer 1 alarms and messages, which provide detailed information regarding the state of the PRI access and the transmission line (For further information, see the CCITT/ITU guidelines G.703 and G.704).

L1 Status			
Flags	00:38		
Signal	✘	Lines	=
No A-Bit	✔	No AIS	✔ !
CRC4det	✘	FAS	✘
E-Bit	✘	Code	HDB3
Sa5	Tx: 1111	Rx: 0000	
Sa6	Tx: 0000	Rx: 0000	
Level Measurement			
Signal Level	No Signal	0.00 V	
Line Voltage	No Voltage	0.0 V=	
Counter	Abs.	Rel.	
E-Bit Count	0		
CRC Error	0	0	
Code Error	0	0	
Frame Error	0		
ISDN PRI NT		Signal:	✘
Lines: = Tx: 4/5 Rx: 1/2		CRC:	✔
		X	Reset

<x>

The PRI relay for the Rx/Tx pin assignment will be toggled to its other position, regardless of the state that it was in before. This function is only available in the L1 status menu if there is currently no signal. The state of the relay will remain unchanged when you close the L1 status menu.

wires = means that Rx/Tx are normal
wires X means that Rx/Tx are inverted

<Reset>

Reset the History function and all counters.

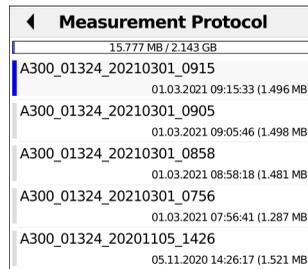
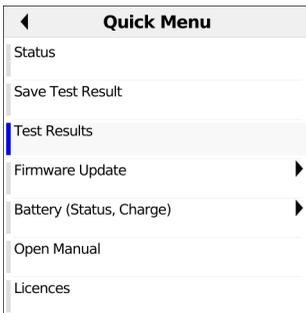


You can obtain further information on display contents in the ARGUSpedia on the instrument.

19 Test results

The saved test results are displayed either in the ARGUS display or on the PC as a detailed measurement log.

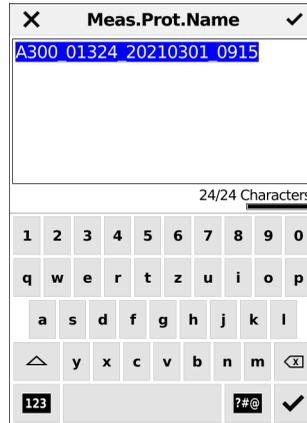
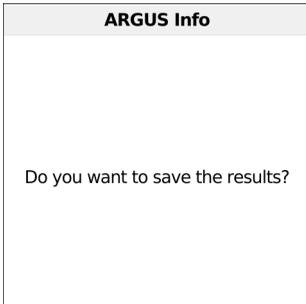
The ARGUS stores the test results together in 50 definable save slots. The system suggests "New result" as the default save name. The saved test results are also deleted when all configuration settings are reset.



The test results can be selected in the Quick Menu. By selecting a test result and then pressing the confirmation key, the test results are displayed.

- <More> The "Sort" and "Rename" softkeys are displayed.
- <Sort> Sorting:
 - Ascending by name
 - Descending by name
 - Ascending by date
 - Descending by date
- <Rename> Changes the name
- <Select all> Selects all test results
- <Delete all> Deletes one or all test results

19.1 Saving test results



You can save the result after the end of a test or after disconnecting a connection. The ARGUS saves the test result in the first free slot. If all slots are occupied, you need to manually select a slot to overwrite

The ARGUS automatically suggests a save name. The name is made up of:

- Device Type (here A300)
- Serial number (here 01324)
- Configured date (here 01 January 2021)
- Set time (here 09:15)

You can accept the displayed save name or enter a new one using the number keys. You can enter up to 24 characters. The ARGUS displays the number of characters used so far.

Save name: Input see Access name page 31.

<Last name> The ARGUS suggests the last save name used.

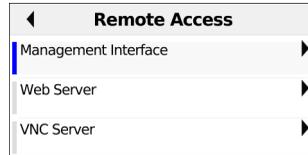
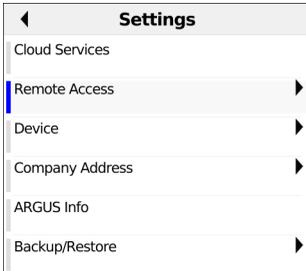
19.2 Sending test results to PC

The test results can be sent to the PC for visualization and archiving. Connect the ARGUS (ARGUS socket "USB-B") to the interface of your PC using the cable supplied and select A300 in the Explorer. The "results" folder now contains the test results that can be opened in the browser.

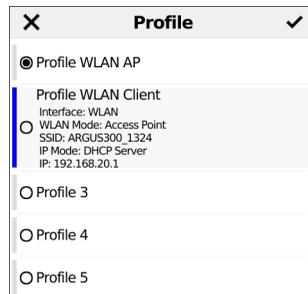
20 WLAN

The ARGUS offers WLAN as the management interface for an array of functions.

20.1 Switching on WLAN



After pressing the gear button, you reach the instrument settings. After selecting Remote Access, select Management Interface.



Here you can start the management interface and edit the profile.



For editing the profile, the Management Interfaced must be switched off.



Either ETH or WLAN can be selected as the management interface; the default setting is WLAN.

You can change this under “Device settings/Management interface/Interface”. This is only possible when the management interface is greyed out under “Start/Management interface”; if WLAN or Interface is greyed out, switch off the management interface first.

The WLAN interface is now activated. The ARGUS is now in access-point mode (ARGUS-AP). The WLAN symbol in the status line is green .

You can set up a WLAN connection with the ARGUS by selecting the WLAN access with the name “Argus300_SerialNumber” on a smart phone, tablet or laptop and entering the

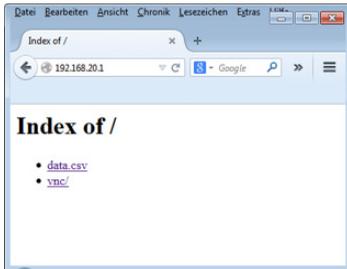
password stored in the ARGUS.



Electronic job management applications can also access the ARGUS and pick up measurements using WLAN. Ask our Support team about this.

20.2 Test results via WLAN

If for example a laptop has a working WLAN connection with the ARGUS, you can open the Web server by entering the IP address of the ARGUS unit or myargus.info in your browser's address bar.



The measurement log with the name data.csv can be opened directly or saved on the laptop.

You can also use this functionality to save, delete and rename measurement logs. For this, you require a WebDAV application/app on your PC/laptop or smart phone/tablet.



The connection data of the last measurement are saved in the .csv file.

The command “VNC” lets you control the ARGUS remotely via your browser.



You may first need to activate the VNC server on the ARGUS.



Further information regarding the VNC server is available on request.



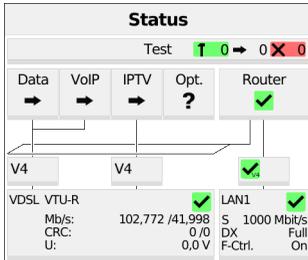
The ARGUS Web server has its own SSL certificate (myargus.info), which permits https:// access.



You can also access the ARGUS using WebDAV via myargus.info. By this means, you can download measurement logs in .amp format directly from the ARGUS via Ethernet or WLAN.

20.3 WLAN in router mode

When the ARGUS WLAN interface is active, it is connected directly with the ARGUS router. If you want to use the ARGUS as a true WLAN access point (ARGUS-AP) and e.g. start a download with this device as the gateway, you must first start a DSL access (ADSL, VDSL, SHDSL, see page 40).



If the router (see diagram) has been started, both WLAN and LAN1 are connected to the ARGUS router.

The smart phone, tablet or laptop can use the ARGUS as an access point. All applications such as data, VoIP or video that can be run e.g. on a smart phone can now be executed for testing via ARGUS - thus replacing all customer devices.



WLAN and LAN are not linked via an Ethernet bridge. Each requires its own configuration. They may not be configured identically.
A test from WLAN to LAN or vice-versa is not possible.

21 ARGUS settings

The ARGUS can be custom-configured for special requirements. The default values are restored using "Reset" (see page 192).

21.1 Cloud services

The ARGUS supports cloud services for communicating with its environment. These services enable the ARGUS to share data with other systems via its test interface. The ARGUS offers test interfaces for ADSL, VDSL, G.fast, SHDSL, Ethernet, GPON and WLAN. When connected via these interfaces and with the data service running, the ARGUS can download firmware updates, import a configuration and upload measurement logs..



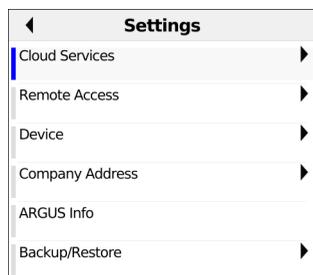
The cloud services are deactivated by default.



At a minimum, the data service must be connected and successfully started via a VL using the corresponding test interface.



The instrument only checks whether there is a different firmware on the server than the one it has loaded. Be aware of this if you have your own update server. Downgrades are possible, and can result in a loss of configuration data.



After pressing the gear button, you reach the instrument settings. After selecting the cloud services, select e.g. firmware update.

Select the cloud service you wish to configure and open it with  .

You must agree to the privacy policy before use.

The following cloud service parameters can be configured:

- Firmware update
 - Server
 - FTP Server address
 - User name
 - Password
 - Profile name
 - Check for updates
 - Updating
- Importing configurations
 - Server
 - FTP Server address
 - User name
 - Password
 - Profile name
 - Test
 - Import destination
 - Import
- Upload measurement log
 - Server
 - FTP Server address
 - User name
 - Password
 - Profile name



You can obtain further information on settings in the ARGUSpedia on the instrument.



Three server profiles are offered for server selection. All three profiles are identical, and differ only in their profile names:

- Server profile 1: Firmware
- Server profile 2: Configuration
- Server profile 3: Measurement log

You can also assign any name to the server profiles (Profile name) for your use, e.g. you can create two different profiles for importing configurations if measurement log uploading is not needed.



Only the server profile “Firmware” is preconfigured. When the server specified in this profile is used, the ARGUS always looks for a new firmware version on intec’s server. The ARGUS instrument logs onto the server with its serial number and IP address.



See page 206 for the meanings of all symbols used in the cloud updates.

21.1.1 Cloud update

The cloud update process is explained in the following. In this example, VDSL VTU-R mode is configured and selected as described in Chapter 5, “Configuring accesses” (see page 28). For details on configuring the firmware updates, see the chapter “ARGUS settings”, page 181.



Never under any circumstances import a configuration when the ARGUS is operating in battery mode. Connect the ARGUS to the power adapter before importing a configuration.

Status

Test 1 0 → 0 X 0

Data → VoIP → IPTV → Opt. ?

V4 V4

VDSL VTU-R ✓

Mb/s: 102,772 /41,998
CRC: 0 /0
U: 0,0 V

Profile VDSL2 G.993.2 17a
Vectoring Off
Showtime 0:00:15

Parameter	Down/Near	Up/Far
Att. D. Rate	151915	51051
Output Power	+13,7	-3,5
CRC	0	0
Sollwert	Ok	Ok

V VDSL Net Data Rate ↓ 102,772 Mb/s ↑ 41,998 Mb/s

Retransmission: f ↑ CRC: ↓ ↓ FEC: ↓ ↓

Info Stop

Status

Test 1 0 → 0 X 0

Data ✓ VoIP ? IPTV ? Opt. ?

✓

VDSL VTU-R ✓

Mb/s: 102,772 /41,998
CRC: 0 /n/a
U: 0,0 V

Active Time: 00:00:58

Connecting the service.



See page 225 for important information on updating your ARGUS firmware.

The profile shown in the display (in this example profile 17a) is used for the cloud update.

<Info> Activation duration

<Stop> Deactivates service

If no connection is established, ARGUS automatically connects at this point (see page 40).

The service Data and the VDSL connection are active.

- <Info> Activation duration
- <Test> Opens test selection
- <Stop> Deactivates the service

The blue “FW” in the status line indicates that a firmware update is available.



Use the menu key to switch to the Quick menu and start the firmware update.

The ARGUS automatically restarts after a successful firmware update.

21.1.2 Automatic configuration import

This function enables you to read out and adopt the ARGUS configuration file.



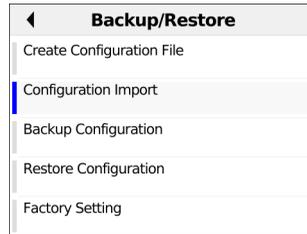
Never under any circumstances import a configuration when the ARGUS is operating in battery mode. Connect the ARGUS to the power adapter before importing a configuration.

Prerequisites:

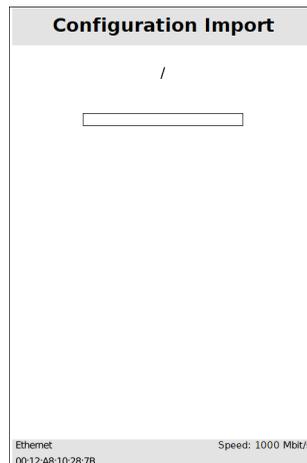
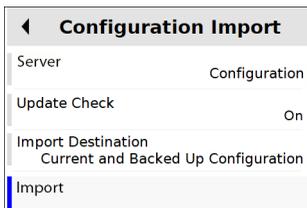
The instrument is connected to the interface (xDSL, G.fast, Ethernet or LTE).

The instrument must connect with the server, and a suitable configuration file for this instrument must be available.

If the configuration is not imported immediately, the instrument will display a corresponding message each time the instrument is powered up.



In the settings, select "Backup/Restore" and then "Configuration Import".



A new configuration file is available.

The configuration file is downloaded.

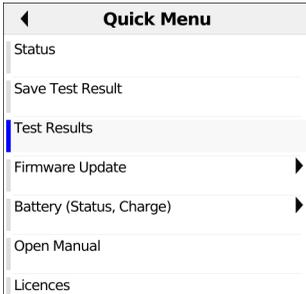


The instrument needs a few seconds before it can be restarted; this is indicated by an hourglass in the top right next to the battery indicator.

<Restart> Restarts device

21.1.3 Upload measurement logs

This function enables you to upload test results to an external server and download them again at a later date.



The screenshot shows a 'Measurement Protocol' screen with a list of test results. At the top, it displays '15.777 MB / 2.143 GB'. The list contains five entries, each with a protocol ID, a timestamp, and a file size.

Protocol ID	Timestamp	File Size
A300_01324_20210301_0915	01.03.2021 09:15:33	1.496 MB
A300_01324_20210301_0905	01.03.2021 09:05:46	1.498 MB
A300_01324_20210301_0858	01.03.2021 08:58:18	1.481 MB
A300_01324_20210301_0756	01.03.2021 07:56:41	1.287 MB
A300_01324_20201105_1426	05.11.2020 14:26:17	1.521 MB

- <Order> Sorts test results by name or date (ascending or descending).
- <Select all> Selects all test results.
- <Delete> Deletes test result.

21.2 Remote access

The ARGUS offers a wide variety of remote control functions. For instance, it can connect to a mobile end-user device (smart phone or tablet) via the WLAN interface, and can be remotely controlled from the mobile device.

The following test parameters can be configured for remote access:

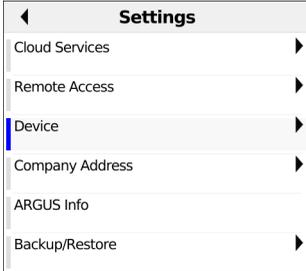
- Management interface
 - Start management interface
 - Select interface
 - WLAN
 - SSID
 - Password
 - Channel
 - DHCP server
 - IP settings
 - IP address
 - Netmask
 - Gateway
- Webserver
 - Start webserver
 - Password protection
- VNC server
 - Start VNC
 - Password protection
 - VNC scaling



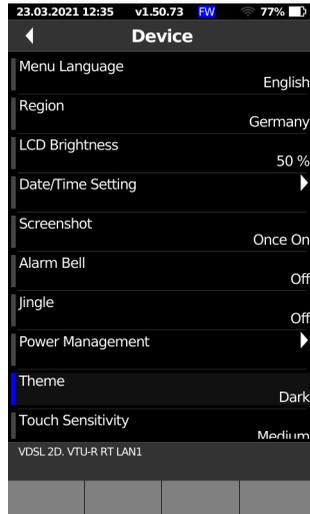
You can obtain further information on settings in the ARGUSpedia on the instrument.

21.3 Device settings

Changing a device setting is described using the setting "Design" as an example.



After pressing the gear button, you reach the instrument settings. After selecting Device, select e.g. Design.



The default is indicated with a ● in the display.



Mark the desired setting. The marked setting is highlighted in blue in the display.



Return to next-higher level menu without saving setting change.



Saves the setting change.

The following device parameters can be configured:

- Operating language
- LCD brightness
- Set date/time
- Ring volume
- Alarm tone
- Power-up tone
- Power-saving mode
- Software option
- Licenses
- Company address



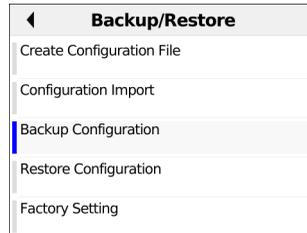
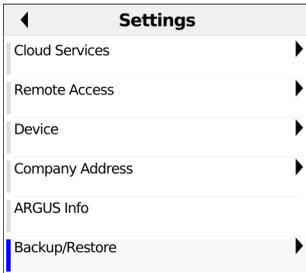
You can obtain further information on settings in the ARGUSpedia on the instrument.

21.4 Backing up and restoring settings

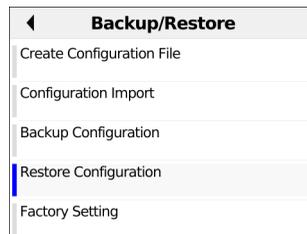
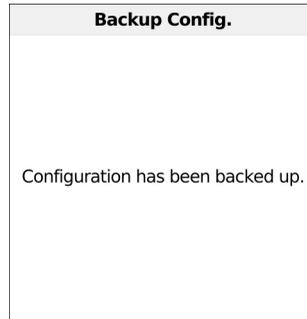
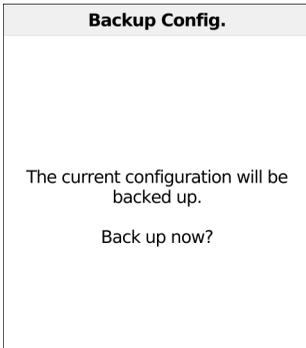
The ARGUS offers multiple functions for backing up and restoring settings. In addition to the actual backup/recovery of the settings configured in the ARGUS, these also include the options of restoring the factory defaults and importing configurations to overwrite the current one.

21.4.1 Backup/restore

With the ARGUS, you can back up all settings (call numbers, PPP user name, PPP password, IP addresses, profile names and more) and restore them if needed.



All settings made in the ARGUS are backed up unchanged and can thus be restored later.



The settings are now backed up and can be restored as necessary.

Select "Restore Configuration".



and



Restores the saved test settings.



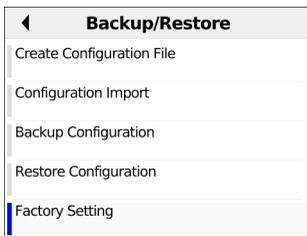
If no settings have been backed up, this function has the same effect as "Restore factory defaults". A security password is not required.

21.4.2 Restoring the factory settings

The ARGUS resets all settings to the factory defaults.



The call numbers, PPP user name, PPP password, IP addresses, profile names and all test results stored in the ARGUS are deleted



All parameters are reset to the factory defaults.



If no settings have been backed up, this function has the same effect as "Restore factory defaults".

22 Update via PC

You can download firmware files online free of charge at www.argus.info/service and then upload them to the ARGUS.

Go to the web page www.argus.info.

Click the menu option "Service" (highlighted in blue here) in the navigation bar.



In the drop-down Service menu, click the option "Downloads".



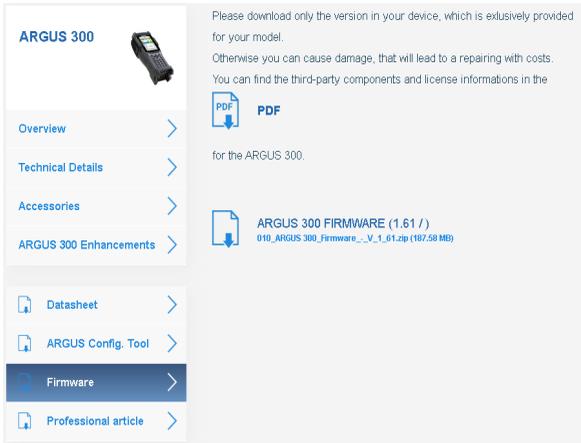
This opens up a product overview.



Select your ARGUS instrument.

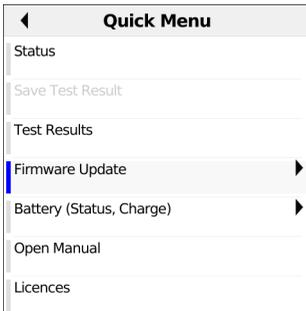
Once you select your device, you are automatically taken to the firmware updates.

22 Update via PC



The screenshot shows a web page for the ARGUS 300. On the left is a navigation menu with items: Overview, Technical Details, Accessories, ARGUS 300 Enhancements, Datasheet, ARGUS Config. Tool, Firmware (highlighted), and Professional article. The main content area contains a warning: "Please download only the version in your device, which is exclusively provided for your model. Otherwise you can cause damage, that will lead to a repairing with costs. You can find the third-party components and license informations in the PDF for the ARGUS 300." Below this is a download link for "ARGUS 300 FIRMWARE (1.61 / 010_ARGUS 300_Firmware_-_V_1_61.zip (197,58 MB)".

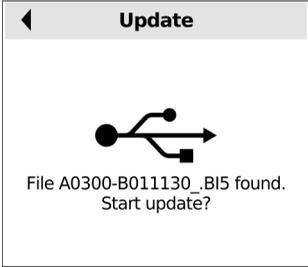
The ARGUS 300 functions as a mass storage device and is connected to the PC via a USB cable. After downloading the firmware, load it onto your ARGUS 300 using Windows Explorer.



Next, select “Firmware update” in the quick menu (illustration at left). Then select ARGUS Mass Storage (see image at right).



When updating the firmware the ARGUS instrument must be charged to at least 50 % capacity or connected to a power adapter. You are prompted to confirm the ARGUS connecting to the PC as a USB mass storage device (see image at right).



Once the ARGUS is connected to the PC, the firmware file is displayed when you press Start.



The update is now started. This requires a restart of the ARGUS.

Important information on updating your ARGUS firmware:



- An ARGUS USB cable is required for updating (USB cable with mini-USB plug).
- You should back up the configuration and measurement logs to a PC before performing an update.
- Do not switch off the ARGUS during the update.
- Be sure to observe the messages in the ARGUS display.



If problems occur because of a failure to follow these safety instructions, repeat the update process up to three times.

Each repetition makes it possible to overwrite further faulty software components.

23 Using the battery pack

Changing the battery pack

Power down the ARGUS and disconnect the power adapter. Then release the two screws securing the battery pack.

Handling the battery pack



The ARGUS may only be operated using the battery pack supplied with the device; connecting other power supply units to the contacts of the device will damage the ARGUS.

- Only charge the supplied battery pack in the ARGUS.
- Do not use the ARGUS battery pack in other devices.
- Power adapters from other ARGUS instruments are not compatible with the ARGUS 300. Attempting to connect the power adapter of another device to the ARGUS 300 can damage the socket.
- Active charging of the battery pack and automatic charging (on by default) may only be carried out in a temperature range of 0 °C to +40 °C.
- Charge the battery pack completely at least once a month (even if the device has not been used for a longer period!).
- The lithium ion battery pack should be stored with a charge of 40 to 60 %. When storing the device for longer periods, you should refresh this charge level every six months. To prevent full discharge, remove the battery pack from the device for long-term storage.
To maximise battery life, do not store the battery long-term at temperatures above +50 °C.
- See the chapter Safety information (page 9) for detailed information on using and transporting the lithium ion battery pack safely.

Status

The ARGUS indicates the current state of the battery graphically in the display when no power adapter is connected. A battery symbol flashes in the display when it is down to a power reserve of approx. 8 minutes (depending not the operating mode). Tone errors, and in extreme cases malfunctions, can occur in this period. Connect the power adapter. The ARGUS can recharge the battery completely when the power adapter is connected. The ARGUS power pack does not require manual discharge. A complete charging cycle can take up to approx. 6 hours.

Quick Menu	
Status	
Save Test Result	
Test Results	
Firmware Update	▶
Battery (Status, Charge)	▶
Open Manual	
Licences	

Battery Status	
State	Charging
Remaining Capacity	90 %
Power Supply Plugged In	Yes
Actual Voltage	7994 mV
Actual Current	1754 mA
Average Current	-579 mA
Temperature	21,5 °C
Device should be turned off	No
Learning actual battery capacity	No

Battery	
Status	
Automatic Charging	On

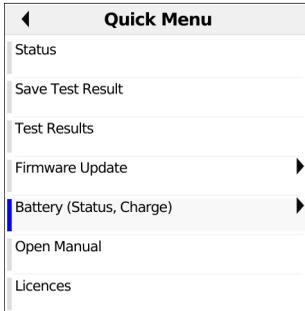
When the power adapter is connected, you can view the battery status in the quick menu. This displays the voltage, current level, temperature and other parameters during the charging process.

Automatic battery charging in the background

ARGUS Manager			
☰	⚙️	Management Profile (Profil WLAN Client)	Management (On)
Web Server Start (Off)	VNC Server Start (On)	LCD Brightness (50 %)	Automatic Shutdown (After 15 Minutes)
Automatic Charging (On)	Restart GUI	Stop GUI	Theme (Light)

ARGUS Manager			
☰	⚙️	Management Profile (Profil WLAN Client)	Management (On)
Web Server Start (Off)	VNC Server Start (On)	LCD Brightness (50 %)	Automatic Shutdown (After 15 Minutes)
Automatic Charging (Off)	Restart GUI	Stop GUI	Theme (Light)

In the ARGUS Manager, you can toggle “Automatic charging (on)” to “Automatic charging (off)” and back by tapping this option. When automatic charging is on, the ARGUS charges the battery automatically in the background when the mains adapter is connected as soon as the battery status falls below a threshold value (battery symbol in display).



You can also toggle automatic charging on and off in the quick menu.

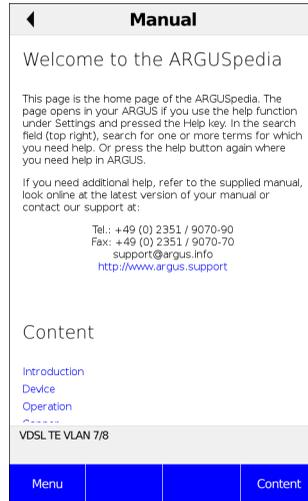
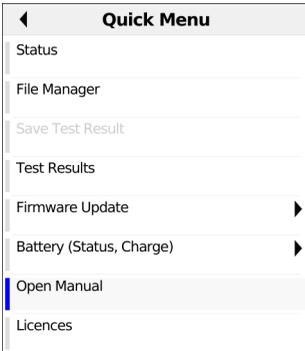


When the ARGUS is disconnected from the power adapter before that battery is completely charged, the ARGUS does not automatically continue charging when it is subsequently reconnected because the charge is no longer below the threshold.

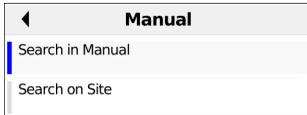
24 ARGUSpedia

The ARGUSpedia is an internal help function with lots of information about the device and settings. It is an important supplement to this manual.

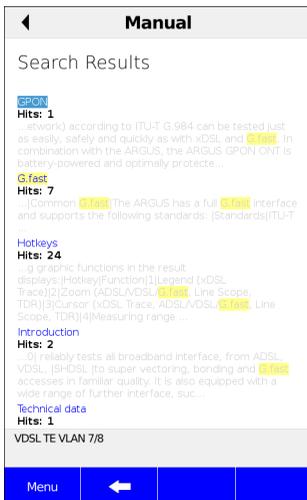
Select “Open Manual” in the Quick Menu to open the ARGUSpedia.



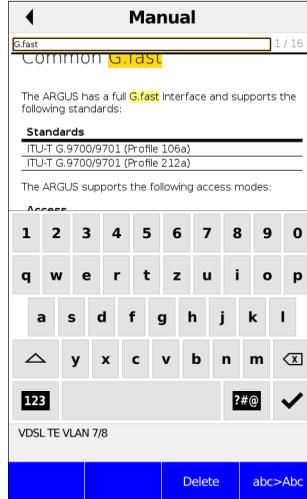
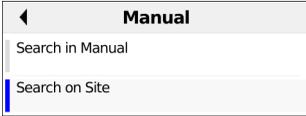
Now you can either navigate via the links in the content menu or search in the Manual or on the site that you are actually on by selecting the Softkey „Menu“.



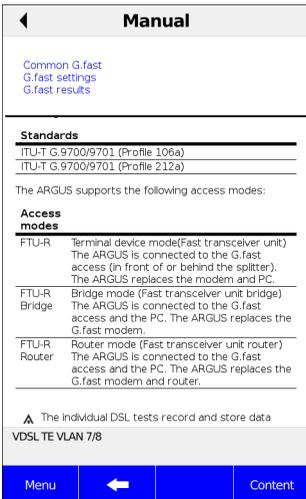
After selecting „Search in Manual“, you can enter a search term.



Now you get a list of search results. The search term is highlighted in yellow. In addition, it is indicated how many hits there are on the respective pages.



After selecting „Search on Site“, you can enter a search term. All results on this page are highlighted in yellow.



On many pages, you can jump to specific sections. These sections are shown on the top of the page after using the softkey „Content“. Just tap on them or use the cursor keys to jump to one of these sections.

25 Appendix

A) Hotkeys

Graphic functions:

After starting the xDSL interface or a test such as line monitor or TDR, you can use the following graph functions in the result displays:

Hotkey	xDSL Trace	ADSL/VDSL, G.fast	Line scope	TDR
Number key 1	Name	-	-	-
Number key 2	-	Zoom	Zoom	Zoom
Number key 3	Cursor	Cursor	Cursor	Cursor
Number key 4	-	-	Measuring range	Measuring range
Number key 5	-	-	Total power	Pulse width/ amplitude
Number key 6	-	-	-	Cable type/VoP
Number key 7	-	-	Probe	-
Number key 8	-	-	Symmetry	-
Number key 9	-	Setting x-axis	Time/FFT	-
Number key 0	-	Min/max	Peak-hold	-
Number key #	-	-	100 Ω input resistance	-
	-	Continue	-	-
	-	-	Start/stop	Start/stop
Press one after another  and 	-	-	Reference curve	Reference curve

Hotkey assignment

You can call important functions/tests directly using the keys of the ARGUS keypad.

Depending on the selected access type (xDSL and Ethernet in this example), different hotkeys can be used:

Hotkey	Service	ADSL	VDSL/ G.fast	SHDSL	ETH
	Status screen	x	x	x	x
	VoIP call	x	x	x	x
Press one after another  and 	Displays ARGUS-specific information such as ARGUS type, software version, serial number, own MAC address, software options, user information (see below)	x	x	x	x

◀ ARGUS Info	
Type:	ARGUS 300
SW Version:	R2.00.00D_ [816-6]
Date:	07.10.21
Serial Number:	1324
Line:	00:12:A8:11:05:2C
LAN/SFP:	00:12:A8:10:05:2C
SSID:	ARGUS300_1324
SW Options:	
ADSL Annex A/L/M	
ADSL Annex B/J	
VDSL	

VDSL Bonding
VDSL2 Long Reach
VDSL2 Long Reach Bonding
G.fast 106 MHz
G.fast 212 MHz
G.fast Bonding
SHDSL 2-Wire
SHDSL 4-Wire
SHDSL 8-Wire
BRI
PRI

Among other details, the ARGUS info displays the ARGUS type, the software version, the set software options and the serial number.

POTS
Ethernet
Ethernet SFP
2.5GigE
GPON
PON Installation Test
PON Installation
WLAN (USB) Client
WLAN Spectrum Analysis
TR-069
Optical Power Meter

Optical Fault Finder
Fiber Inspection Tool (USB)
VoIP
IPTV
RFC 6349
Ookla® Speedtest®
iperf
Multimeter
RFL
Line Scope
TDR

✕ Option Key ✓																									
0																									
Serial Number: 1324																									
<table border="1" style="width: 100%; text-align: center;"> <tbody> <tr> <td>1</td><td>2</td><td>3</td><td>A</td><td>B</td><td>C</td> </tr> <tr> <td>4</td><td>5</td><td>6</td><td>D</td><td>E</td><td>F</td> </tr> <tr> <td>7</td><td>8</td><td>9</td><td>:</td><td>-</td><td><X></td> </tr> <tr> <td>*</td><td>0</td><td>#</td><td>.</td><td>ABC</td><td>✓</td> </tr> </tbody> </table>		1	2	3	A	B	C	4	5	6	D	E	F	7	8	9	:	-	<X>	*	0	#	.	ABC	✓
1	2	3	A	B	C																				
4	5	6	D	E	F																				
7	8	9	:	-	<X>																				
*	0	#	.	ABC	✓																				

When you select “Option”, you can enter the option Key.

B) Symbols



The following symbols can be displayed in the ARGUS status line.

Symbol	Colour	Purpose	Description
	Black	Battery pack	This symbol shows the current battery status.
	Blue	Cloud update	The firmware can now be updated.
	Grey	Cloud update	The update function is active but no update can be found. For example, due to an incorrect server path.
	Blue	Configuration import	A configuration file has been found.
	Grey	Configuration import	The configuration check is active but no configuration can be found. For example, due to an incorrect server path.
	Grey	Variable	Importing a configuration or executing a test.
	Green	WLAN	WLAN is active. ARGUS is now in access-point mode.
	Grey	WLAN	WLAN is not active.
	Grey	Ethernet	The management interface Ethernet is selected.
	Green	Ethernet	The management interface Ethernet is active.
	Black	Volume	Signal tone deactivated.
	Black	Volume	Signal tone activated.



The following symbols can appear in the ARGUS main display area.

Symbol	Colour	Description
	Grey	The service is not yet assigned to a virtual line.
	Grey	This service, VL or physical layer is idle.
	Grey	The service is unavailable.
	Yellow	Activating the physical layer, VL or service.
	Yellow	Physical layer, VL or service deactivated due to an unexpected occurrence.
	Yellow	Deactivating.
	Green	Synchronisation achieved (physical layer) or a VL or service was activated successfully.
	Green	A test is currently running in this service.
	Red	An error has occurred.
	Grey	Preparing activation of physical layer, VL or service.
	Orange	The Tx and Rx values are not equal in the VoIP QoS test.
	Green	Test running.

	Red	Test stopped.
	Green	Graphs are zoomed.
	White	Graphs are not zoomed.
	Green	Cursor is activated.
	White	Cursor is deactivated.



The following symbols are displayed in this field.

Symbol	Colour	Description
	Green	No CRC errors occurred in the last second.
	Red	No FEC errors occurred in the last second in upstream and downstream.
	Green/ Red	No upstream CRC errors occurred in the last second in upstream.
	Red/ Green	No FEC errors occurred in the last second in downstream.
	Blue/ Grey	Retransmission configured but not active.
	Blue	Retransmission active.
	Red	Retransmission active; errors occurring.

C) VoIP-SIP status codes

SIP requests:

The six basic requests/methods:

- INVITE** Invites the user to call (initiates session)
- ACK** Confirms an INVITE request
- BYE** Terminates the session
- CANCEL** Cancels the connection process
- REGISTER** Provides subscriber availability information (host name, IP address)
- OPTIONS** Provides information on supported functions of the SIP telephones involved in the call

SIP responses:

SIP responses follow on the SIP requests. There are six basic SIP response types with numerous variants.

- 1xx** Provisional responses
(e.g. 180 shows ring at recipient)
- 2xx** Successful responses
- 3xx** Redirect responses
- 4xx** Client failure responses
- 5xx** Server failure responses
- 6xx** Global failure responses

ARGUS display: code no.	Meaning	Explanation
100	Trying	Trying to connect
180	Ringing	The phone at the other end is ringing.
181	Call Being Forwarded	The call is being forwarded.
182	Call Queued	The call is in a wait loop.
183	Session Progress	The call is being setup.
200	OK	Everything is all right.
202	Accepted	Connection has been accepted.
300	Multiple Choices	There is no unique destination address for the remote end. Please select one.
301	Moved Permanently	The call is permanently forwarded.
302	Moved Temporarily	The call is temporarily forwarded.
305	Use Proxy	A proxy must be used.

380	Alternative Service	Alternative service.
400	Bad Request	The request is not OK.
401	Unauthorized	You are not authorized.
402	Payment Required	Payment is required.
403	Forbidden	This is not permitted.
404	Not Found	The remote end was not found or does not exist.
405	Method Not Allowed	Method (e.g. SUBSCRIBE or NOTIFY) is not allowed.
406	Not Acceptable	The call's options are not allowed.
407	Proxy Authentication Required	The proxy must be authenticated.
408	Request Timeout	The time for the request has been exceeded (timeout).
409	Conflict	There is a conflict.
410	Gone	The subscriber can no longer be reached.
411	Length Required	The length must be supplied.
413	Request Entity Too Large	The values are too long.
414	Request URI Too Long	The URI is too long. (Destination address)
415	Unsupported Media Type	The codec is not supported.
416	Unsupported URI Scheme	The URI scheme is not supported. ? (Destination address)
420	Bad Extension	The extension is wrong.
421	Extension Required	An extension is necessary.
423	Interval Too Brief	There is a problem with the SIP parameters. (Register Expire is too short)
480	Temporarily Unavailable	The subscriber is currently not reachable.
481	Call/Transaction Does Not Exist	This connection does not exist (any longer).
482	Loop Detected	A redirection loop has been detected.
483	Too Many Hops	Too many redirects.
484	Address Incomplete	The SIP address is incomplete or faulty.
485	Ambiguous	The SIP address is ambiguous.
486	Busy Here	Subscriber is busy.
487	Request Terminated	The request has been terminated.
488	Not Acceptable Here	The call cannot be accepted.
491	Request Pending	A request is waiting.
493	Undecipherable	Decryption error.
500	Server Internal Error	Internal error in the server.
501	Not Implemented	The requested method (functionality) has not been implemented.
502	Bad Gateway	The gateway is bad.
503	Service Unavailable	The service is not available.

504	Server Time-Out	The gateway did not respond in time.
505	Version Not Supported	The SIP protocol version is not supported.
513	Message Too Large	The message length is too long. Use TCP.
600	Busy Everywhere	All terminals are busy at the remote end.
603	Declined	The remote station declined the call.
604	Does Not Exist Anywhere	The subscriber no longer exists.
605	Not Acceptable	Impermissible SIP request.

D) Vendor identification numbers

Abbreviation	Vendor
ALCB	Alcatel (STMicroelectronics)
ANDV	Analog Devices
BDCM	Broadcom
GSPN	Globespan
IKNS	Ikanos
IFTN	Infineon
META	Metanoia
STMI	STMicroelectronics
TSTS	Texas Instruments

E) Software licenses

The ARGUS firmware contains code from open-source packages published under a variety of licenses (GPL, LGPL, MIT, BSD, etc.).

Additional information can be found on the internet at: <http://www.argus.info/en/service/downloads>. After selecting your device type, you can download a PDF with the software licenses.

If you are interested in the sources listed under GPL/LGPL, please contact support@argus.info. intec Gesellschaft für Informationstechnik mbH will provide you with a machine-readable copy of the source texts for a nominal fee to defray the costs of the physical copying process. This offer is valid for 3 years.

F) Abbreviations

Characters	
.bis	Reference to SHDSL.bis (Enhanced SHDSL)
2B1Q	2 binary 1 quaternary - line code
3PTY	Three party service
4B3T	4 binary 3 ternary - a modified monitored sum 43-code (MMS43)
ΔC	Absolute deviation between CaE and CbE
Δf	Bandwidth
ΔR	Absolute deviation between Ra and Rb
Ω	Ohm (electrical resistance)
A	
a	a-wire (tip)
A	Ampere (electrical current)
A3K1H	Audio 3,1 kHz
A7kHz	Audio 7 kHz
AAL	ATM adaptation layer
AC	Alternating Current or Access Server
ACS	Auto Configuration Server
ADSL	Asymmetric Digital Subscriber Line
AFTR	Address Family Transition Router
AI	Action indicator
AIT	Application information table
AMP	ARGUS measurement protocol
ANSI	American National Standards Institute
Anx.	Annex
AOC	Advice of charge
AOC-D	Advice of charge Charging information during the call
AOC-E	Advice of charge Charging information at the end of the call
APN	Access Point Name
ARP	Address Resolution Protocol
AS	Available Second
ASCII	American Standard Code for Information Interchange
ATM	Asynchronous Transfer Mode
ATU-R	ADSL Transceiver Unit - Remote
Auto-MDI-X	Automatic Medium Dependent Interface Crossing
Avg	Average
B	
b	b-wire (ring)

BC	Bearer capability
BER	1. Basic Encoding Rules 2. Bit error rate
BERT	Bit error rate test
BGP	Border Gateway Protocol
BNG	Broadband Network Gateway
BR	Bridge
BRAS	Broadband access server
BRI	Basic rate interface
C	
C	1. Celsius 2. Capacitance
c_0	Speed of light
CALL PROC	CALL PROCeeding Message
CAT	Conditional access table
CC	Continuity counter
CCBS	Completion of calls to busy subscriber
CCNR	Call complete no response
CD	Call deflection
CDN	see also CDPN
CDPN	CalleD party number
CF	Call forwarding
CFB	Call forwarding busy
CFNR	Call forwarding no reply
CFU	Call forwarding unconditional
CGN	see also CDPN
CGPN	CallinG party number
CLIP	1. Calling Line Identification Presentation 2. Clipping
CLIR	Calling Line Identification Restriction
Cm	Operating capacitance (mutual capacitance)
CNS	CLIP-no screening
CO	Central office
Codec	Coder decoder
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CONN	CONNect Message
CONN ACK	CONNect ACKnowledge message
Cp	Parallel Capacitance
CQE	Conversational Quality Estimated
CR	Call reference

CRC	Cyclic redundancy check
C_{sym}	Capacitive symmetry
CT	Call transfer
CUG	Closed user group
CW	Call waiting
D	
dB	Decibel
dBm/Hz	Performance measurement with the reference quantity 1 mW (milliwatt) per hertz
DC	Direct Current
DCE	Data communication equipment
DDI	Direct dialling in
DDM	Digital diagnostic mode
DF	Delay factor
DHCP	Dynamic Host Configuration Protocol
diffserv	Differentiated services
DIN	Deutsches Institut für Normung - German Institute for Standardization
DISC	DISConnect message
DL	Download
DMT	Discrete Multitone Transmission
DNS	Domain Name System
DPBO	Downstream power backoff
DS	Downstreamband
DSCP	Differentiated services codepoint
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
DSS1	Digital Subscriber Signalling System No. 1
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi Frequency
DTU	Data Transmission Unit
E	
E1	Primary Rate Interface
EARFCN	EUTRA Absolute radio-frequency channel number
EC	European Community
ECT	Explicit Call Transfer
E-DSS1	European Digital Subscriber Signalling System Number 1
EFM	Ethernet in the First Mile (Protokoll see IEEE 802.3ah)
EFS	Error Free Seconds
EIT	Event Information Table
ElektroG	Elektro- und Elektronikgerätegesetz, German law governing electrical and electronic devices

EMC	Electromagnetic compatibility
EN	European standard
EoA	Ethernet over ATM
EOC	Embedded operations channel
ES	Errored seconds
ESHDSL	Enhanced SHDSL (SHDSL.bis)
ete	end-to-end
ETH	Ethernet
ETR	Expected Throughput Rate
ETSI	European Telecommunications Standards Institute
F	
F	Farad (unit of electrical capacitance)
Fax G3	Telefax group 3
Fax G4	Telefax group 4
FEC	Forward error correction
FFT	Fast Fourier transform
FSK	Frequency shift keying
FTP	File Transfer Protocol
FW	Firmware
G	
G.fast	G.fast access to subscriber terminal
GB	Gigabyte
Gbit/s	Gigabits per second
GCID	Global Cell ID
G.hs	ITU-T G.994.1 Handshake procedure
GigE	Gigabit Ethernet
GND	Ground (earth)
H	
h	hour
HD	High definition
HDLC	High-level data link control
HDSL	High bit rate digital subscriber line
HEC	Header error checksum
hex	Hexadecimal
HLC	High layer compatibility
HLOG	Amplitude of transmission function per tone
HOLD	Call hold
HRX-Wert	Hypothetical reference value
HTTP	Hypertext Transfer Protocol
Hz	Hertz (measuring unit of frequency)

I	Electric current
IAD	Integrated access device
ID	Identifier
IDC	DC Current
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
INFO	INFORmation Message
INP	Impulse noise protection
IP	Internet Protocol
IPCP	Internet Protocol Control Protocol
IPoA	Internet Protocol over ATM
IPoE	Internet Protocol over Ethernet
IPTV	Internet Protocol Television
ISO	International Standards Organization
Iso.	Isolation resistance measurement
ISP	Internet service provider
ITSP	Internet telephony service provider
ITC	Independent TC
ITU	International Telecommunication Union
	K
KB	Kilobyte
kbit/s	Kilobits per second
	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
LACP	Link Aggregation Control Protocol
LAN	Local Area Network
LAPD	Link access procedure for D-channels
LCD	Liquid crystal display
LCL	Longitudinal Conversion Loss
LCN	Logical channel number
LCP	Link Control Protocol
LED	Light-emitting diode
LLC	Low layer compatibility
LLDP	Link Layer Discovery Protocol
LOS	Loss of synchronize
LOSWS	Loss of sync word seconds
LQ	Line qualification
LQO	Listening quality objective

LTE	Long Term Evolution
M	
m	Meter
MAC	Media Access Control
MB	Megabyte
Mbit/s	Megabits per second
MCC	Mobile Country Code
MCID	Malicious call identification
MDF	Main Distribution Frame
MDI	Media Delivery Index (RFC 4445)
MLR	Media loss rate
MMS	Microsoft Media Server Protocol
MNC	Mobile Network Code
min.	Minute
Modem	Modulator-demodulator
MOS	Mean opinion score (ITU-T P.800)
MPEG	Moving Picture Experts Group
MSA	Multiple source agreement
MSN	Multiple Subscriber Number
MTU	Maximum Transmission Unit
mV_{pp}	Millivolt peak-to-peak
N	
n/a	not available
n/r	not received
n/u	not used
NAT	Network address translation
NEXT	Near-end crosstalk
NGN	Next generation network
NIT	Network information table
NOK	Not OK
NP	Numbering plan
NSAP	Network service access point
NSF	Network specific facilities
NT	Network termination
NTR	Network timing reference
O	
OAM	Operation, Administration and Maintenance
OM	Omni Mode
OoS	Out of Sequence
OSI	Open Systems Interconnection
OUI	Organizationally unique identifier

P	
P/N	Part number
PABX	Private automatic branch exchange
PADI	PPPoE active discovery initiation
PADO	PPPoE active discovery offer
PADR	PPPoE active discovery request
PADS	PPPoE active discovery session confirmation
PADT	PPPoE active discovery termination
PAM	Pulse amplitude modulation
PAP	Password Authentication Protocol
PAT	Program association table
PC	Personal computer
PCR	Program clock reference
PD	Protocol discriminator
PDU	Protocol data unit
PEN	Private Enterprise Number
PID	Packet identifier
PIN	Personal Identification Number
PLR	Packet loss ratio
PMT	Program map tables
Pol.	Polarity
POTS	Plain old telephone service (PSTN)
P-P	Point-to-point
P-MP	Point-to-multipoint
PMMS	Power measurement modulation session
PMS	Physical media specific
PPP	Point-to-Point Protocol
PPPoA	Point-to-Point Protocol over ATM
PPPoE	Point-to-Point Protocol over Ethernet
PPTP	Point-to-Point Tunneling Protocol
PSD	Power spectral density
PSI	Program specific information
PWR	Power
Q	
Q in Q	IEEE 802.1.ad, S-VLAN
QLN	Quiet line noise
QoS	Quality of service
R	
R	1. Resistance (electrical resistance) 2. Ring (b-wire)
Ra	Resistance a-wire

Rb	Resistance b-wire
RE	Ground resistance
RC	Resistance (R) and capacitance (C)
REIN	Repetitive electrical impulse noise
REL	RElease message
REL ACK	RElease ACKnowledge message
REL COMPL	RElease COMPLete message
Rem.	Remote (instrument kit control)
RF	Radio frequency
RFC	Request for comments
Ri	Internal resistance
Ring	b-wire
RJ	Registered jack (standardised socket)
RoHS	Restriction of hazardous substances
Rs	Loop resistance
R_{sym}	Resistance symmetry
RT	Router
RTCP	Real-Time Control Protocol
RTP	Real-Time Transport Protocol
RTSP	Real-Time Streaming Protocol
Rx	Received
S	
s	second
S/N	Serial number
SBC	Session Border Controller - Outbound Proxy
SCI	Sending complete indication
SDT	Service description table
Segm.	Segmented
SES	Severely errored second
SFF	Small form factor
SFP	Small form factor pluggable
SHDSL	Single-Pair High-speed Digital Subscriber Line
SHINE	Single high impulse noise event
Sig.	Signatures
SIM	Subscriber Identity Module
SINR	Signal-to-interference-plus-noise ratio
SIP	Session Initiation Protocol
SNR	Signal-to-noise ratio
SNRM	Signal-to-noise ratio margin
SPB	Shortest Path Bridging
Spch	Speech (dt. Sprache)

SRU	SHDSL regeneration unit
SRV	Service record
SSL	Secure Sockets Layer
STB	Set-top box
STU-C	SHDSL Transceiver Unit - Central Office
STU-R	SHDSL Transceiver Unit - Remote
STUN	Session Traversal Utilities for NAT
SUB	Subaddressing
SUSP	SUSPend message
Sym	Symmetry
	T
T	1. Tip (a-wire) 2. Trigger
TAC	Type Approval Code
TC	1. Trellis code 2. Transmission convergence
TCP	Transmission Control Protocol
TC-PAM	Trellis-coded pulse amplitude modulation
TDM	Time division multiplex
TDR	Time domain reflectometry
TDT	Time and date table
TE	TErminal, terminal equipment
TEI	Terminal endpoint identifier
Tel31	Telephony 3.1 kHz
Tel7k	Telephony 7 kHz
TLS	Transport Layer Security
TM	Test manager
ToN	Type of Number
ToS	Type of service
TP	Terminal portability
TPID	Tag Protocol Identifier
TRG	Tip, Ring, Ground
TS	1. Technical specification 2. Transport stream
TTX	Teletext
Tx	Transceived
	U
U	Voltage
U_{AC}	AC Voltage
U_{DC}	DC Voltage
UDP	User Datagram Protocol

UL	Upload
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
US	VDSL: Upstream band or SHDSL: Unavailable second
USB	Universal Serial Bus
UTC	Coordinated Universal Time
UUI	User-user info
UUS	User-to-user signalling
V	
V	Volt
V/2	Pulse propagation time
VC	Virtual channel
VCC	1. Virtual channel connection 2. Voltage at the common collector
VCI	Virtual channel identifier
VC-MUX	Virtual circuit multiplexing
VDSL	Very High Speed Digital Subscriber Line
ViSyB	Video syntax-based
ViTel	Video telephony
VLAN	Virtual Local Area Network
VL	Virtual line
VLC	Video LAN client
VNC	Virtual Network Computing
VoD	Video on demand
VoIP	Voice over Internet Protocol
VoP	Velocity of propagation
VPI	Virtual path identifier
V_{pp}	Volt peak-to-peak
VTU-R	VDSL Transceiver Unit - Remote
W	
WebDAV	Web-based Distributed Authoring and Versioning
WEEE	Waste Electrical and Electronic Equipment
www	World Wide Web
X	
xDSL	Collective term for the different DSL variants
xTU-C	xDSL Transceiver Unit - Central Office
xTU-R	xDSL Transceiver Unit - Remote
Z	
Z	Apparent resistance

G) Index

A

Abbreviations	213
Access	
Analogue	24
Bottom	24
Copper	24
Ethernet	24
ISDN	169
SHDSL -n-wire	24
xDSL	24
Access mode	21
Access wizard	30
ADSL	
Bridge	36
Connecting	54
Data rate	41
Determining connection parameters	39
Disconnecting	54
Display bit distribution	44
Display quiet line noise	49
Display saved test results	56
Display trace data	43
Router	36
Selecting interface	37
Supported standards	19
Aggregation phase	53
Aggregation-Phase	53
Alias www address	106
Ambient temperature	36
Appendix	203
ARGUS	
Control panel	17
Dimensions	17
Inputs and outputs	17
Settings	181
Weight	17
ARGUS status	204
Automatic charging	11, 13, 197
Automatic configuration import	185

B

Basic package	1
Battery pack	
Active charging	11, 13, 197
Attaching	26
Automatic charging	198
Changing	197
Charge level	197

Charging	26
Charging temperature range	11, 13, 197
Long-term storage	13, 197
Protective functions	13
Storage	197
Transport	13
Transport information	11
Using	197
Bits/tonne	44
BRAS statistics	80
Bridge tap	
HLOG	50
Rule of thumb	50

C

Cable	
Patch	59, 64
xDSL	39, 59
Charging the battery	11, 13, 26, 197
Checksum errors	90
Configuration import	197
Configuring accesses	28
Conformity declaration	18
Connection type	138
Connections	
Bottom	24
Top	23
Country code	52
Cursor function	47

D

Data	71
Declaration of conformity	18
Dielectric strength	19
DIN EN 50419	12
Disposal	12
Download	105
Rate	109, 111
DSL	36
Duplex	
Full	66
Half	66

E

Electromagnetic compatibility	11, 18
ElektroG	12
EN62368-1	18
Ethernet	
Access type	64
Establishing connection	66
Mismatch	66
Statistics	80

Transmission speed	24
F	
Fiber	160
Firewall	61
Flow control	66
FTP download	84, 110
FTP server	84, 116
FTP upload	84
G	
G.fast	
Supported standards	19
Graph functions	203
Graphic functions	203
H	
Handshake	53
HLOG/tone	50
Hotkey assignment	204
Hotkeys	203
HTTP download	83, 105
HTTP upload	83
Humidity	17
I	
Index	223
Initial operation	26
intec Gesellschaft für Informationstechnik mbH	9
Introduction	6
IP ping	83, 85
Results	90
Test parameters	85
IP tests	85
IPTV	83
Profile	138, 146, 147
Scan	146
Tests	138
IPTV scan	83
ISDN	169
Access mode	169
Select interface	169
K	
Key	17
Back	21
Cursor	21
Enter	20
Handset	21
Keypad	20
Level	21
Power	20

L

Layer 1	35
Layer 2	69
Layer 2/3 settings	72
Layer 3 parameters	69
LEDs	20
Line socket	19

M

Measurement log	176, 196
Micro USB	23
MOS	121, 127

N

Notice	34
Number block	21

O

Operating temperature	17
Optical Fault Finder	162
Optical Power Meter	160
Overview of tests	203

P

Packet response time	90
PADI	82
PADO	82
PADR	82
PADS	82
PADT	82
Parallel tests	155
Physical layer	35
Power supply	18
Power-saving mode	27
PPP	
Profile	72
Statistics	80
Trace	81
PPTP	79
Profile name	191
Profiles	72
Protection functions	36
Provider Code	52
PWR	23

Q

QLN/tone	49
Quick-start guide	20

R

Real-time clock	27
Regulations for hazardous materials	13
Return of old equipment	12

R-factor	121
Rights	2
RoHS conformity	18
RoHS Directive	12
RTP	121, 129

S

Safety information	10
Save name	176
Saving test results	176
Sending test results to PC	177
Service	
Start	73, 76
Service statistics	84
Services	71, 83
SHDSL	
Connection parameters	63
Determining connection parameters	63
EFM states	53
STU-C	36
SIP	121
SNR/tone	48
Softkeys	22
Dual function	22
Software licenses	212
Standards	19
Status screen	204
STB	138, 151
Storage temperature	17
Stub line	
Rule of thumb	50
Support	9
Supported standards	19
Symbols	71

T

Temperature range for charging battery pack	17
Test results	176
Tests	83
Timestamp	43
Traceroute	83, 93
Transmission function	50

U

Update	193
USB	
Client interface	23
Host interface	23
User safety	18
Using the battery pack	197

V

VDSL	
Disconnecting	68
Display connection parameters	40
Profile	41
Supported Profiles	19
Supported Standards	19
Version	1
Virtual lines	69, 70
Activating	73, 78
Additional	74
Examples	77
Multiple	141
Profile	83
VLAN	69
Voice codec	127
Voice quality	127
VoIP	
Call	126, 137
Call acceptance	133
Destination	126
Echo test	134
Results	132, 145
SIP status codes	212
Tests	121
VoIP call	83
VoIP wait	83
Voltage	
DC voltage range	19
Voltage measuring range	19
Volume	127
VPI/VCI	69

W

Web browser	84
Website	9
WEEE	12
WLAN	178

X

X-Axis	
Frequency	47
X-axis	47
Labelling	47
Tones	47
Zoom	45
xDSL	
Bridge	36
Router	36

Y

Y-axis

Zoom45

Z

Zoom45