

ARGUS 145 *PLUS*

Manual

Version: 2.00 / **EN Quick Guide**

Important Notice:

A basic ARGUS package includes at least a DSL interface (ADSL, VDSL or SHDSL) or a PRI interface together with various related functions and tests. Support for other interfaces and functions is optional (see the Options in the data sheet). Consequently, depending on the scope of the functions delivered, certain menu items may be hidden.

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1 Safety Instructions

The ARGUS may only be used with the included accessories. Usage of other accessories may lead to erroneous measurements and may even cause damage to the ARGUS and the connected installation. The ARGUS is only to be used in accordance with the instructions in this documentation. Any other usage may result in bodily injury and destruction of the ARGUS.



- Before connecting the ARGUS to an access, make certain that the voltages on the line are not hazardous and do not exceed the specifications of the ARGUS or its accessories. You must also taken into account the fact that the voltage may vary while the ARGUS is connected to the access.
- Regardless of the interface or access, use the ARGUS only for its intended purpose.
- Voltages in excess of 50 V AC or 120 V DC can cause mortal injury.
- Never attempt a measurement when the battery pack (accumulator) is not installed!
- The ARGUS is not watertight. Protect the ARGUS from exposure to water!
- Before replacing the battery pack, disconnect all the test leads and switch the ARGUS off.
CAUTION: Never remove the battery pack during operation.
- Unplug the power supply from the mains, once the ARGUS is switched off and will no longer be used (for example after recharging the accumulators)!
- The ARGUS may only be used by trained personnel.
- Do not operate the ARGUS on a power supply that has other specifications.
The specifications are:
(Input: 100 V to 240 V AC; 50/60 Hz; 0.45 A)
(Output: 12 V DC; 1.5 A)
- Do not plug anything into the headset jack other than headsets approved by the manufacturer; the use of this jack for any other application (e.g. connection of a stereo system) is expressly prohibited.
- Do not plug anything into the USB host interface other than mobile storage media - that does not use an external power supply and is - approved by the manufacturer; the use of this jack for any other application (e.g. connection of a PC) is expressly prohibited.
- The ARGUS Power jack must always be covered with the included rubber cap (labeled "Power") while operating in battery mode.



- The electromagnetic compatibility of the ARGUS was checked in accordance with the regulations stated in our Declaration of Conformity.
CAUTION: This tester is a Class A product, which may cause interference when operated in a residential area. In such case, the user must take appropriate measures.
- The ARGUS battery pack may only be actively charged (Charge accus) or trickle charged (default setting: off) when the ambient temperature is between 0 °C (32 °F) and +40 °C (104 °F).
- If the ARGUS is operated under extreme conditions, it may have to automatically shutdown, terminate the current test and drop the connection in order to protect itself and the user.
To ensure reliable long-term operation of the ARGUS, make certain that it is protected from excessive temperatures.
- Do not open the tester.
- In connection with the lithium ion battery pack, please observe the following notes regarding safety and transport.

Return and environmentally acceptable disposal

The RoHS (EU Directive on the "Restriction of Hazardous Substances") guidelines, which restrict the use of certain hazardous substances in electrical and electronic equipment, apply in eight of the ten categories of the WEEE (EU Directive on "Waste Electrical and Electronic Equipment") guidelines. Devices which are in Category 9 "Monitoring and Control Instruments" are currently excluded from the scope of the Directive. The ARGUS products fall into Category 9 and are thus not subject to the RoHS guidelines. Nonetheless, we have voluntarily complied with all of the RoHS guidelines since 1 January 2007.

In compliance with WEEE (EU Directive on Waste of Electrical and Electronic Equipment) 2002/96/EU and the German Electrical and Electronic Equipment Act (ElektroG - Elektro- und Elektronikgerätegesetz), we began marking our testers in October 2005 with the following symbol



() (DIN EN 50419).

In other words, the ARGUS and its accessories may not be disposed of in the household waste.

Regarding the return of old equipment, please contact our Service department.

1.1 Notes on Safety and Transport - Battery Packs

Transport

The battery pack has been tested in accordance with the UN recommendations (ST/SG/AC.10/11/Rev. 4, Part III, Subsection 38.3). Protective measures have been implemented to prevent harm if it is exposed to excessive pressure, short-circuits, dangerous reverse currents or other destructive influences. However, since the amount of lithium contained in the battery pack is in any case less than the current threshold amount, neither the battery pack itself nor the ARGUS in which it is installed are subject to the international hazardous goods regulations. Nonetheless, these regulations may apply if several battery packs are transported at the same time. For more information, please contact us.



The protective features of the battery pack may be harmed if the following instructions are not observed. In this case extremely high currents and voltages may result, which could lead to abnormal chemical reactions, leaking acid, overheating, smoke, or an explosion and/or fire. Furthermore, if the user does not observe and comply with these instructions both the performance and service life may suffer.

Safety Instructions and Warnings

1. Do not disassemble or short-circuit the battery pack.
2. Do not put the battery pack in a fire or heat it ($> 60\text{ }^{\circ}\text{C}$)($140\text{ }^{\circ}\text{F}$).
3. Keep the battery pack dry - do not let it get wet or damp.
4. The ARGUS battery pack may only be actively charged (Charge accus) or trickle charged (default setting: off) when the ambient temperature is between $0\text{ }^{\circ}\text{C}$ ($32\text{ }^{\circ}\text{F}$) and $+40\text{ }^{\circ}\text{C}$ ($104\text{ }^{\circ}\text{F}$).
To maximize a battery pack service life, if it is to be stored over a longer period of time, it should not be exposed to temperatures in excess of $+50\text{ }^{\circ}\text{C}$ ($95\text{ }^{\circ}\text{F}$).
5. The battery pack may only be charged using the associated ARGUS or a charger approved by intec.
6. Do not damage the battery pack with a sharp object.
7. Do not throw the battery pack or expose it to shocks or impacts.
8. If a battery pack is damaged or deformed, do not use it.
9. The contacts of the battery pack are polarized (plus and minus). Make certain that the polarity of the battery pack is not reversed when it is inserted in the ARGUS or when the battery pack is connected to the charger.
10. The battery pack may only be connected to the associated ARGUS or charger in the intended manner.
11. The battery pack may not be directly connected to the output of a plug-in power supply, an automobile cigarette lighter or similar power source.
12. The battery pack may only be used together with an ARGUS.
13. The battery pack may not be connected to, or stored or transported with metallic objects.

14. Do not expose the battery pack to high electrostatic forces.
15. The battery pack may not be used in combination with primary (non-rechargeable) batteries, nor may it be charged or discharged together with other rechargeable batteries.
16. If the battery pack is still not properly charged when the charging time has elapsed, do not charge it again.
17. Do not expose the battery pack to excessive pressure.
18. If the battery pack emits an odor or heats up, becomes discoloured or misshapen, or if there are any other indications of that it has malfunctioned while in use or being charged or stored, remove the battery pack from the ARGUS or charger immediately and do not use it again.
19. If the battery pack leaks acid, make certain that you do not get this acid in your eyes or on your skin. In event that you get this acid in your eyes or on your skin, rinse the affected area immediately with clean water. Do not rub the affected area. In either case, immediate medical care is required. Otherwise, permanent injury may result.
20. The battery pack must be kept out of reach of children.
21. Please read this manual and the associated safety instructions before using the battery pack.
22. If you find that the battery pack emits an odor, is rusty or appears to be in anything other than perfect condition before you first use it, please contact intec to determine how to proceed.

2 General Technical Data

Tester specifications:

Dimensions / Weight Height: 235 mm (9.25 in) Width: 97 mm (3.8 in) Depth: 65 mm (2.56 in) Weight, approx. 810 g (1.79 lbs) (including battery pack)	Inputs / Outputs - RJ-45 (BRI/PRI/E1) for BRI and PRI - RJ-45 (Line) for xDSL, POTS, U- and copper - 2 RJ-45 10/100 Base-T Ethernet - USB-A jack, USB host interface - USB-B jack, USB client interface - Jack for headset
Keypad 25 Keys LCD display LCD colour display with switchable Background lighting 320 x 240 pixels	Temperature ranges Temperature range - charging accumulators: 0 °C (+32 °F) to +40 °C (+104 °F) Operating temperature - battery operation: -10 °C (+14 °F) to +50 °C (+122 °F) Operating temperature - with power supply/car charger: 0 °C (+32 °F) to +40 °C (+104 °F) Storage temperature: -20 °C (-4 °F) to +60 °C (+140 °F) Humidity: up to 95% relative humidity, non-condensing Power supply Lithium-ion battery pack - rated voltage 7.2 V (observe and comply with the safety instructions) or 12 V / 1.5 A ARGUS plug-in power supply
	Other information ARGUS user safety tested in accordance with EN60950-1 RoHS conformity pursuant to the WEEE guidelines The electromagnetic compatibility of the ARGUS was checked in accordance with the regulations stated in our Declaration of Conformity. CE Mark The ARGUS®145 <i>PLUS</i> complies with the EU regulation 2004/108/EG and 2009/C197/03. A detailed statement of conformity is available on request

3 Operation - A Brief Guide



Power key



- Switch the ARGUS ON
- To start up again after a "power down"
- To switch on the display backlighting
In battery mode to save power, the backlighting will switch off automatically after an adjustable period of time.
- To switch off the ARGUS (must be pressed somewhat longer)
After being idle for an adjustable period of time (for example after 10 minutes), the ARGUS will shutdown automatically if it is running in battery mode. If the ARGUS is connected to its power supply, it will automatically charge its accumulators when it is switched off (see page 119 Using the Battery Pack).

Confirmation key



- Open menu
- Open the next display
- Start test
- Confirm the entry

Return key



- The ARGUS will return to the previous display and ignore any entries made at this level, e.g. changes to the settings
- Cancel test
- Close the graphic display

Cursor keys



- Move the cursor through the display lines (vertical cursor keys)
- Move the cursor within a display line (horizontal cursor keys)
- The cursor will jump to the end of a list if the right cursor key is pressed or to the beginning of the list if the left cursor key is pressed.
- Select a menu, function or a test
- Setting the measurement range in a Copper test
- Move the cursor in a graphic display

Telephony

ISDN or POTS



- Pickup or hang up
- Simplified overlap signalling, press the telephone key twice (ISDN only)

xDSL (Access mode xTU-R, xTU-R Router) and Ethernet

- Start VoIP phone

Layer 1 measurement



- BRI, PRI or U-interface access: start the Layer 1 measurement (Level/Voltage)
- xDSL access: display the connection parameters
- Ethernet: Open the Line mode menu
- Start/Stop function in a real-time analysis (Line Scope / TDR)
- Open the graphical status screen

Numerical keypad



- Entry of the digits 0 to 9, letters and special characters
- Direct access to functions appropriate for the selected Access (Hotkey)

Softkeys



- The function of the 3 softkeys varies with the situation. The current assignment of each is displayed on the bottom line of the display in three blue blocks with white text, e.g.:
<Menu>: The Main menu will open.
<Start>: Setup a connection or start a test
- You will find the other softkeys described at the relevant points in the manual.

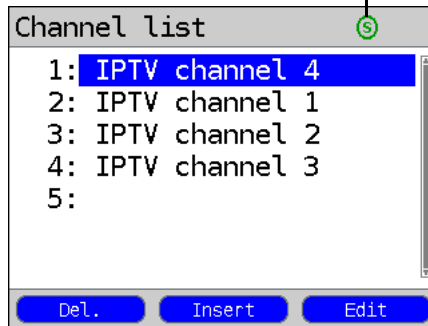
Shift key





In some tests, a green circle with a green “S” will be shown in the uppermost line in the display.
This indicates that the softkeys are assigned twice. In such a case, press the Shift key to change the function of the softkey (for an example, see page 84).





Example

Pressing the Shift key will change the softkey function.

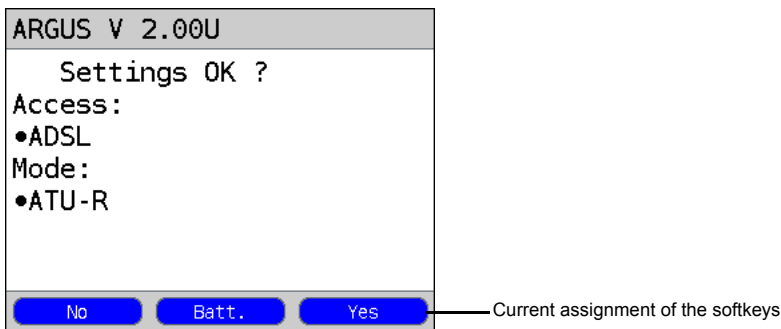


The ARGUS is, in largest part, operated with the 4 cursor keys, the confirmation key , the return key  and the three softkeys.

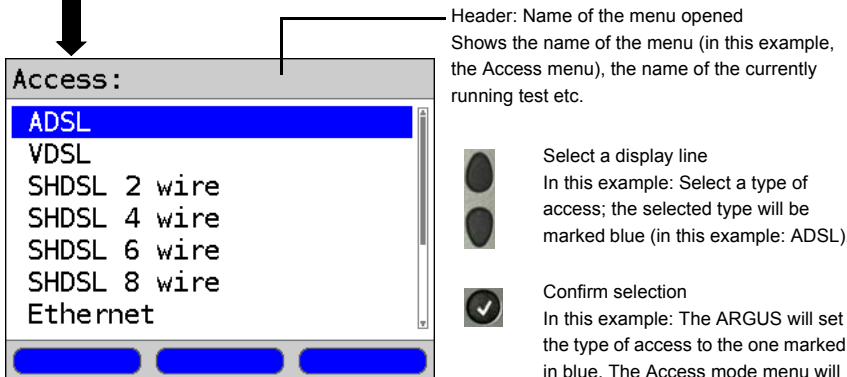
The current assignment of the three softkeys is shown in the lower line of the display.

On the following pages, only the softkey's meaning in the respective context is shown - enclosed in angle brackets < >, e.g. <Menu>. The softkey <  > serves the same function as the confirmation key , and the softkey <  > performs the same function as the cursor key  on the ARGUS keypad etc.

Example of Operation:



<No> The displayed access will not be used. The Access menu will now open:



Select a display line
In this example: Select a type of access; the selected type will be marked blue (in this example: ADSL).



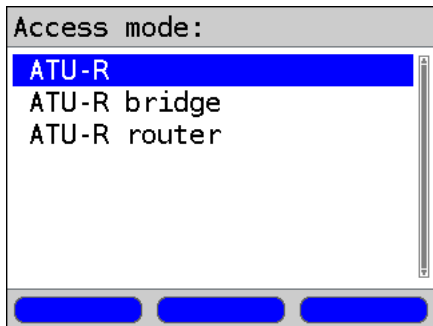
Confirm selection
In this example: The ARGUS will set the type of access to the one marked in blue. The Access mode menu will open.

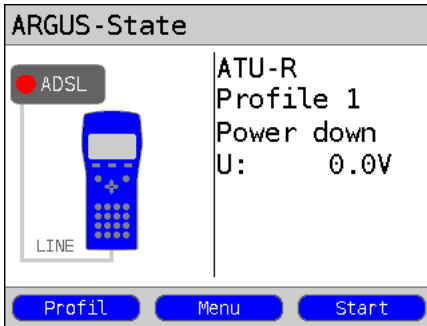


Return to the previous display without changing to marked type of access.



Press the key.

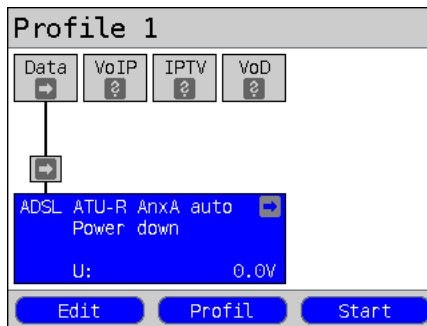




<Profile> Display the profile, see page 22

<Menu> Open main menu

<Start> Start ADSL connection



<Edit> Open the access parameters

<Profile> Display the profile, see page 22

<Start> Start ADSL connection

Connectors at top



PWR

Connection for the external plug-in power supply. If the plug-in power supply is connected, the ARGUS will automatically disconnect the accumulators (battery pack). After it is switched off, the ARGUS will automatically recharge the accumulators (see page 119).

LAN2

Second LAN interface

USB-A

- USB Host interface (Active Probe I + II)

USB-B (mini-USB):

- USB Client interface (PC connection).



Jack for a headset

Connections at bottom

Yellow "Link/Data" LED:
signals that a physical connection has been established to another Ethernet port

- LED on constantly:
A connection has been setup.
- LED flashing: Active - sending or receiving



Green "Speed" LED:
signals the transmission speed

- LED off: 10 Base-T
- LED on: 100 Base-T

BRI/PRI/E1

BRI S/T connection Pin assignment: 3/6, 4/5

PRI connection Pin assignment: 1/2, 7/8

Line

POTS connection Pin assignment: 4/5

U-interface

connection Pin assignment: 4/5

xDSL connection Pin assignment: 4/5

Access

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

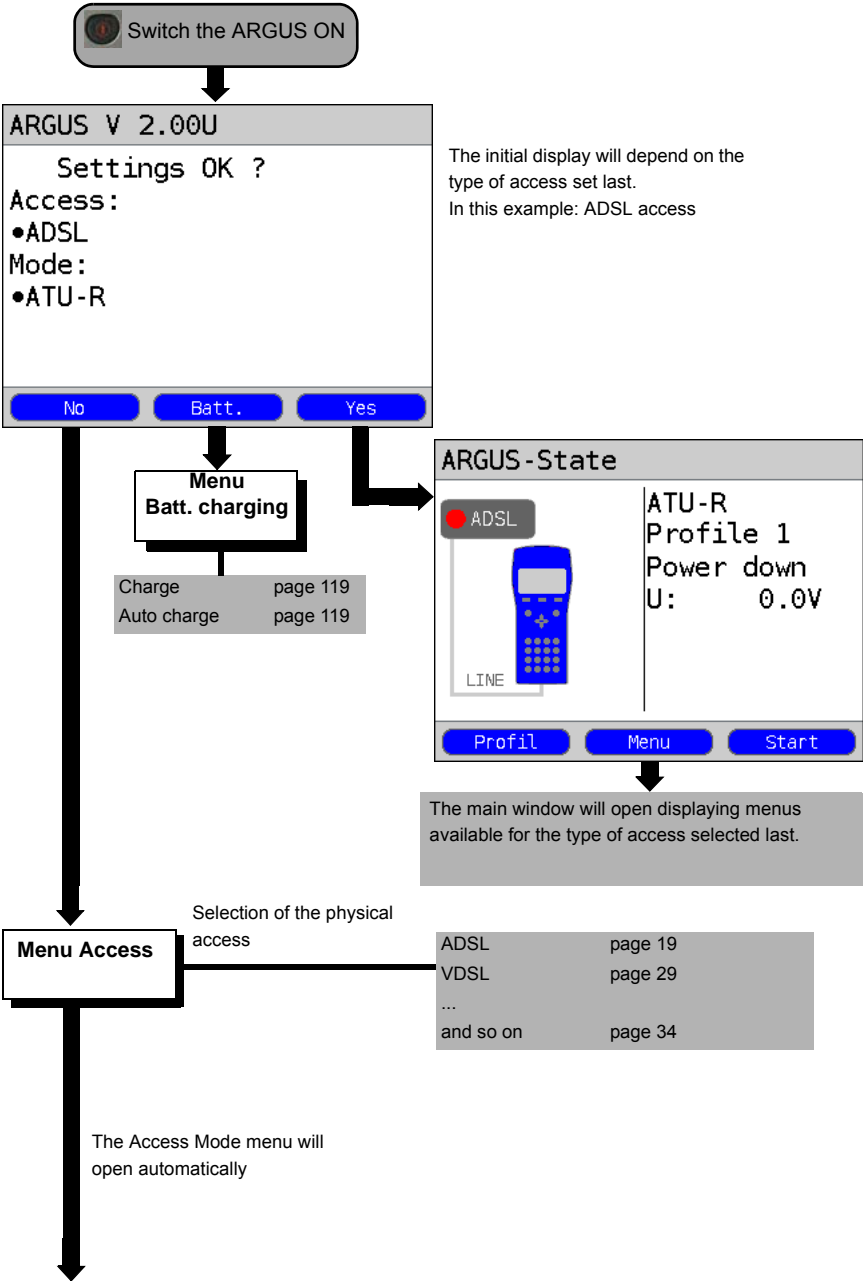
Copper tests Pin assignment: fixed 4/5

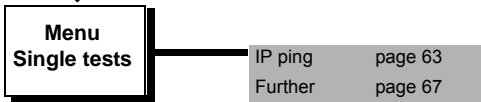
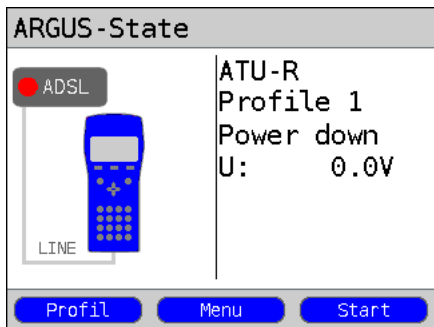
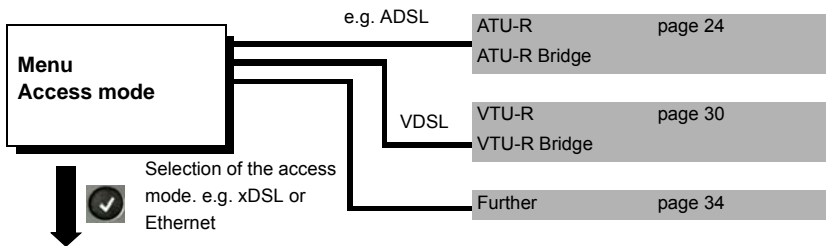
LAN


Connection to a PC's network card
(Access mode: xTU-R bridge, xTU-R router)

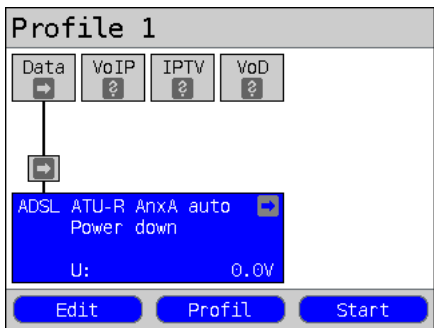
Connection to the Ethernet interface of an
xDSL modem, router (IAD) or a
hub / switch or to another
Ethernet interface (connection: Ethernet)

4 Menu Hierarchy







 For more information regarding the Menu Hierarchy please see the included detailed menu diagram.
The current menu diagrams can also be found under www.argus.info/en.



5 The Physical Layer

The physical layer (Layer 1) is shown in the status screen (figure 2) with its own graphic element (in this example ADSL). The other elements in the status screen will at first only be mentioned. For a detailed description of these, please see page 44 (Virtual Lines) and page 52 (Services). The physical layer of a VDSL, SHDSL or Ethernet access will be displayed in the same manner as for an ADSL access. The ADSL access and the Access mode ATU-R selected are shown in the status screen directly. If the default settings are correct, Layer 1 (ADSL synchronisation) can be setup immediately by pressing <start>. The most important information, e.g. voltage (U), modem states (Power down) and selected configuration (Annex A auto), will be displayed in the Layer 1 box (blue). If you wish to directly change the ADSL access parameters, press <edit>. To change the type of access in a new status screen (figure 2), press the key combination  and .

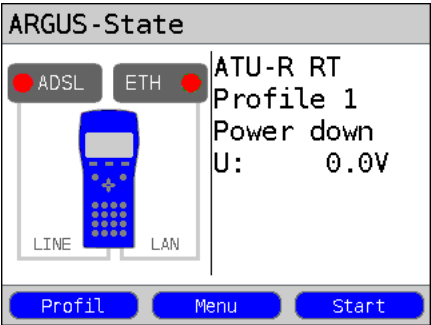
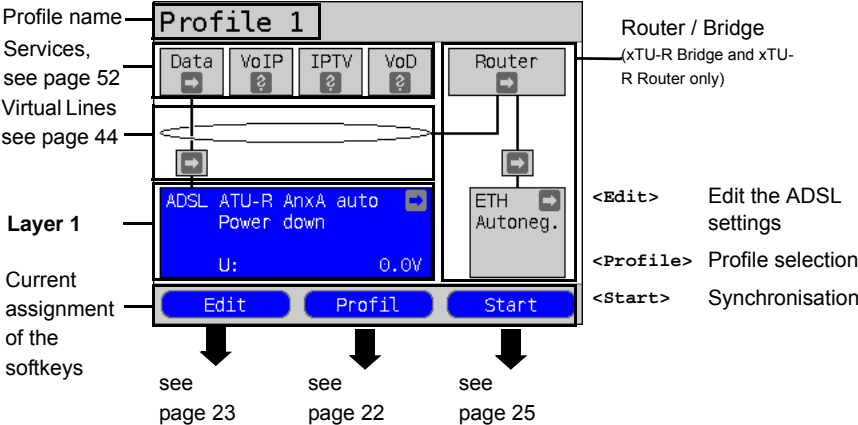


figure 2



Press the Level key



6 Operation on an ADSL Access

The ARGUS supports the following types of access (access modes):

- | | |
|---------------------|---|
| ATU-R | Terminal mode (ADSL Transceiver Unit Remote - ATU-R), see page 24.
Connection of the ARGUS directly to the ADSL access (before or after the splitter). The ARGUS replaces both the modem and the PC. |
| ATU-R Bridge | Bridge mode (ADSL Transceiver Unit Remote Bridge)
Insertion of the ARGUS between the ADSL access and the PC. The ARGUS replaces the ADSL modem. |
| ATU-R Router | Router mode (ADSL Transceiver Unit Remote Router).
Insertion of the ARGUS between the ADSL access and the PC. The ARGUS replaces both the ADSL modem and the router. |



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


6.1 Setting the ADSL Interface and Access Mode

Use the included xDSL cable to connect the ARGUS (Line jack) to the access to be tested and then switch the ARGUS on. The initial display will depend on the access setting used last. Select ADSL as the type of access and ATU-R as the access mode.

ARGUS State display

ARGUS -State

ADSL



LINE

ATU-R

Profile 1

Power down

U: 0.0V

Profil

Menu

Start

Items displayed (from top to bottom):

- Access mode (in this example: ATU-R)
- Preset profile (in this example, Profile 1).
- Status (in this example: "Power down")
- Interface's DC voltage

The ADSL test is not yet started:

Key to the LED symbolized in the display:

Red LED	no test started
Yellow LED	test started
Green LED	A connection has been setup.

<Menu> Open the Main menu.

<Profile> Display the profile, see page 22.

Main menu

Menu

Single tests

Test results

Line status




Settings

Access

Battery charging

Help

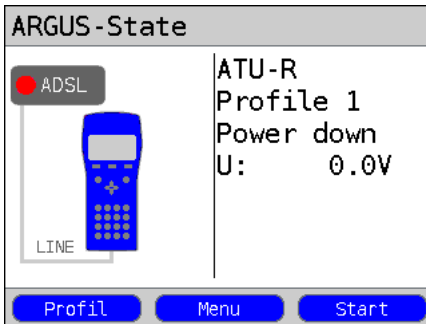
The various submenus available for the selected type of access are shown in the main menu.

	Open the selected menu (in this example, Single tests)
	to select a menu. The selected menu will be marked blue in the display.
	to return to the previous menu (in the example, the State display).

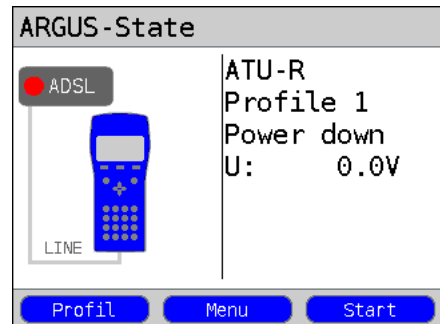
6.2 ADSL Settings

The ARGUS stores all of the settings required to run a test on an ADSL access in profiles. Up to 10 user-defined profiles can be created. A specific profile can be selected before an ADSL connection is setup or a test performed, otherwise the ARGUS will use the default (preset) profile. Only those settings which are relevant will be used for the respective test situation. The default settings can be restored at any time. The procedure for changing a setting will be illustrated with a single example:

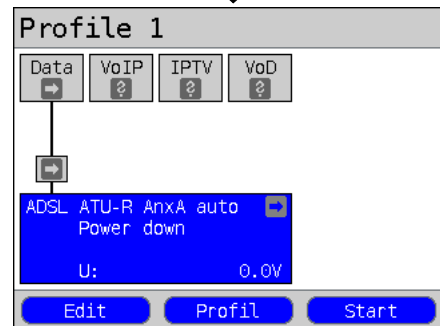
ARGUS – State display



The ARGUS - Main menu

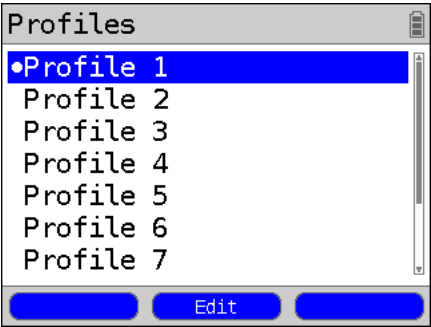


ARGUS - status screen



Continuation on
next page

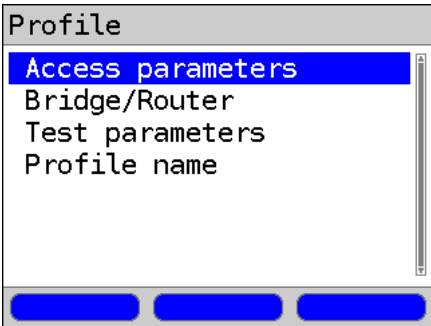
Continuation on page 23, figure 2.



Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the settings in the default (preset) profile when setting up the ADSL connection.



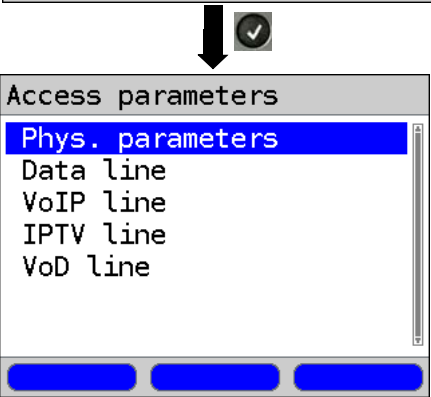
The ARGUS will use the marked profile as the default profile and will open either the State display, the status screen or the Settings menu (depending on whether the profile was opened from the main menu, the status display or the ARGUS-State display).



e.g. select Access parameters

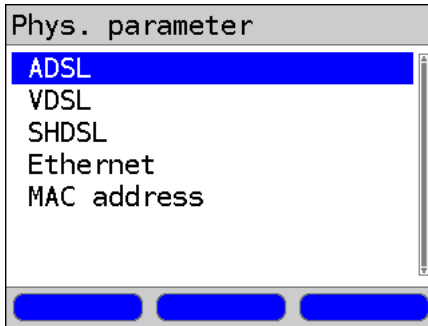
Bridge/Router settings

Test parameter settings beginning on page 53

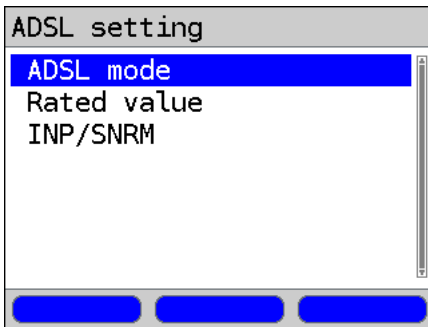


e.g. select Phys. parameters


Continuation on
next page



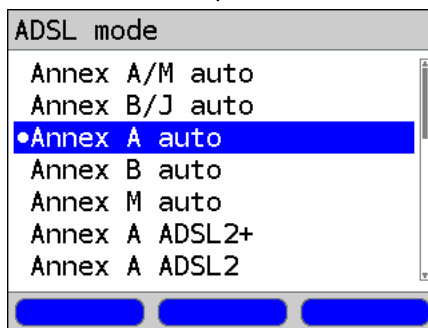
e.g. select ADSL



Entry using <Edit> from page 21.



e.g. select ADSL mode



Select the ADSL mode (in this example, Annex A auto). The default setting will be marked in the display with a ●.



Open the next higher menu without making any changes. The ARGUS will continue to use the default setting.

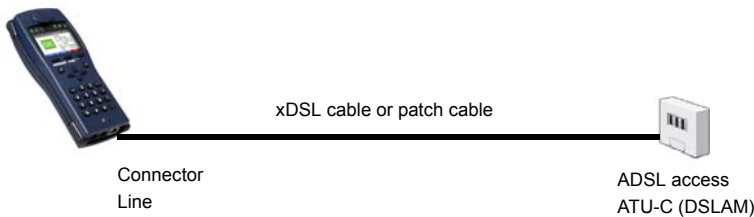


The ARGUS uses the marked ADSL mode as the default and returns to the next higher menu.

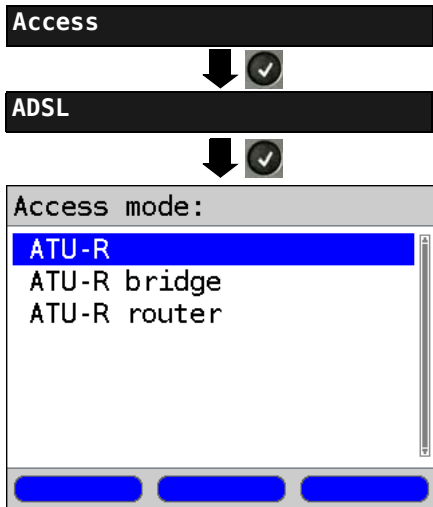
6.3 The ARGUS in the ATU-R Access Mode

Determining the ADSL connection parameter

The ARGUS is connected directly to the ADSL access (either before or after the splitter) using the included xDSL cable or a patch cable. In this case, the ARGUS replaces both the modem and the PC. The ARGUS will set up an ADSL connection and determine all of the relevant ADSL connection parameters. The ARGUS displays the ADSL connection parameters and saves them after the connection is cleared down if desired.



Setting the ATU-R access mode:




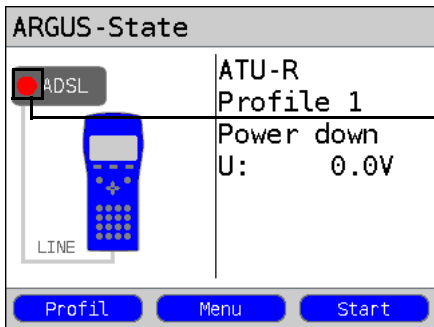
The ARGUS - Main menu

or:



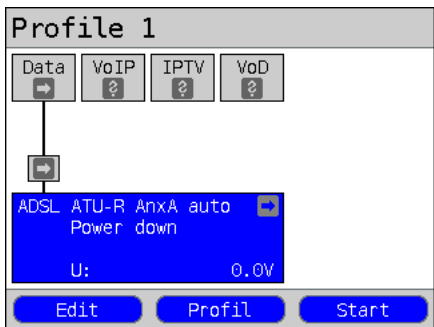
Continuation on
next page





The ADSL test is not yet started: red LED shown in display!

Key to the LED symbol in the display:
Red LED no test started
Yellow LED test started
Green LED A connection has been setup.

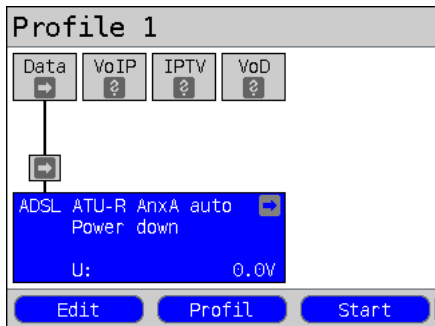


All further functions and procedures will be explained on the basis of this status screen.

Set up an ADSL connection

Profile settings:

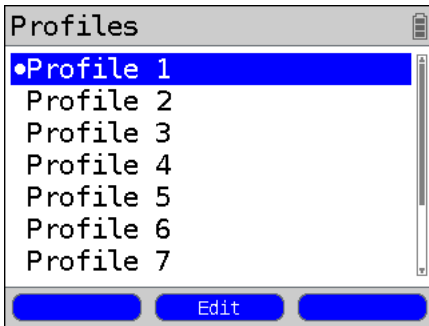
When setting up the ADSL connection, the ARGUS uses the settings saved in the profile (see page 23): ADSL mode, rated value, and INP/SNRM.



ARGUS – status screen

The ARGUS will use the default profile to setup the ADSL connection (in the example, Profile 1).

Continuation on next page



The ARGUS takes over the marked profile as the default and returns to the status screen.

Display the profile.

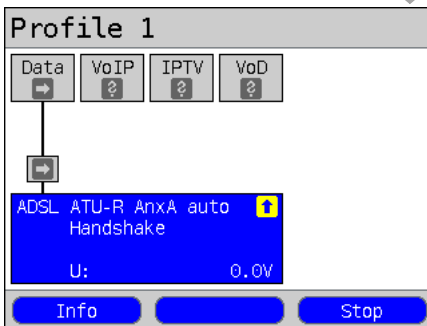
The default profile will be marked in the display with a ● (in this example, Profile 1).



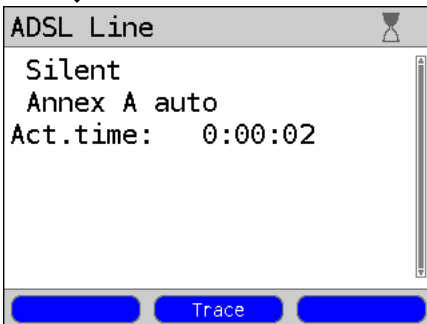
Mark the profile.

<Edit>

Edit the marked profile. The settings of the selected profile can be edited here (see page 22).



or



Continuation on next page

Setting Up an ADSL Connection

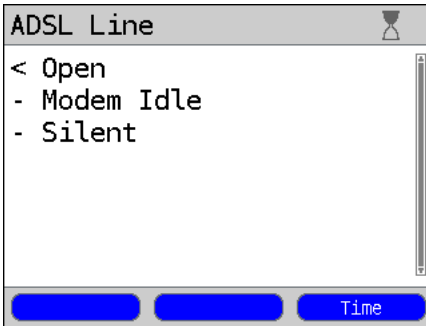
The ARGUS synchronizes with the DSLAM (the "Sync / L1" LED will flash and an element with a yellow background will be shown in the display).

The ARGUS will display the current connection status (in this example Handshake) in the Layer 1 box (blue).

While setting up the connection:

Display:

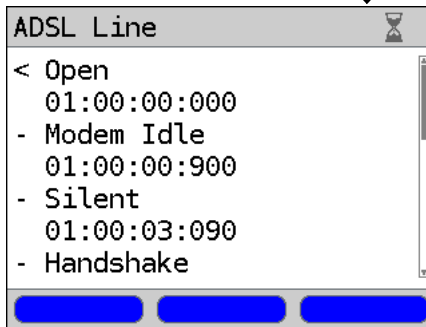
- Current connection status
- ADSL mode
- time elapsed since the start of synchronisation in h:min:sec.



Command symbols:

- < = command sent from the ARGUS
- > = command sent from the DSLAM
- = connection status

Display timestamp.



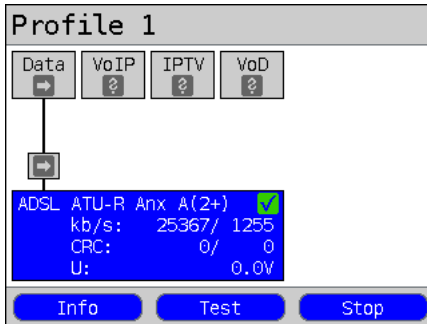
The ARGUS will display the time that the commands arrive.



Return to the previous display and the status screen.

Connection successfully setup

As soon as the connection has been setup ("Sync/L1" LED on constantly and a green check mark in the Layer 1 box), the ARGUS will determine the ADSL connection parameters. After the ARGUS has synchronized, it must remain connected to the ADSL access for at least 20 seconds. After this time has elapsed, the ARGUS will have saved all of the ADSL connection parameters.



or



ADSL Line		
Param.:	d/n	u/f
ATM(int.)	24405	1459
Att.ATM	24372	1459
Attenu.	+0.0	+2.4
OutPower	+17.2	+7.6
SNR mar.	+7.4	+8.5
FEC	0	0

ARGUS - status screen.

Display:

- Default Profile (Profile 1)
- Access and Access mode
- ADSL mode
- d: Downstream data rate
u: Upstream data rate
- Number of CRC errors in upstream and downstream
- Interface's DC voltage

If the current data rate exceeds the rated value set, the ARGUS will display OK in the ARGUS-State, otherwise FAIL will be displayed.

<Info> Display the ADSL connection parameter

<Test> Display the available tests

<Stop> Clear down the ADSL connection

Display the ADSL connection parameters in brief:

- d/n: downstream/near
- u/f: upstream/far



Scroll through the connection parameters.

<Trace> Display the trace data

<Graph> Display result graphs

7 Operation on a VDSL Access

The ARGUS supports the following types of access (access modes):

- | | |
|---------------------|---|
| VTU-R | Terminal mode (VDSL Transceiver Unit Remote), see page 30.
Connection of the ARGUS directly to the VDSL access (before or after the splitter). The ARGUS replaces both the modem and the PC. |
| VTU-R Bridge | Bridge mode (VDSL Transceiver Unit Remote Bridge).
Insertion of the ARGUS between the VDSL access and the PC. The ARGUS replaces the VDSL modem. |
| VTU-R Router | Router mode (VDSL Transceiver Unit Remote Router).
Insertion of the ARGUS between the VDSL access and the PC. The ARGUS replaces both the VDSL modem and the router. |



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

7.1 Setting the VDSL Interface and Access Mode

The VDSL interface and Access mode are configured in the same manner as an ADSL access is, see page 20 et seq.

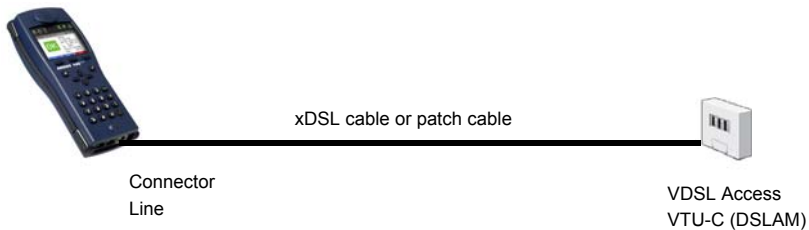
7.2 The ARGUS in the VTU-R Access Mode

Determining the VDSL connection parameter

The ARGUS is connected directly to the VDSL access (either before or after the splitter) using the included xDSL cable or a patch cable. In this case, the ARGUS replaces both the modem and the PC. The ARGUS will set up a VDSL connection and determine all of the relevant VDSL connection parameters. The ARGUS displays the VDSL connection parameters and saves them after the connection is cleared down if desired.



Use only the cable included in the package!



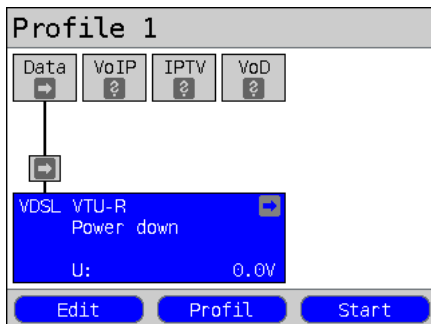
Setting the VTU-R access mode:

The VTU-R access mode settings are configured in the same manner as those for ATU-R, see page 24.

Setting Up a VDSL Connection

Profile settings:

When setting up the VDSL connection, the ARGUS uses the settings saved in the profile.

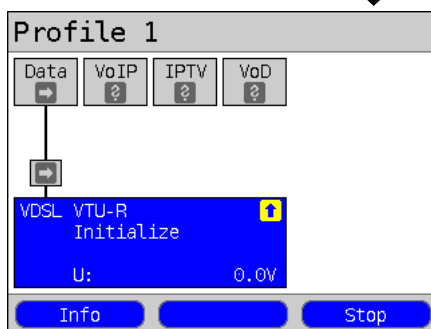


ARGUS - status screen

The ARGUS will use the default (preset) profile to setup the VDSL connection (in this example, Profile 1).

<Edit> Open the access parameters

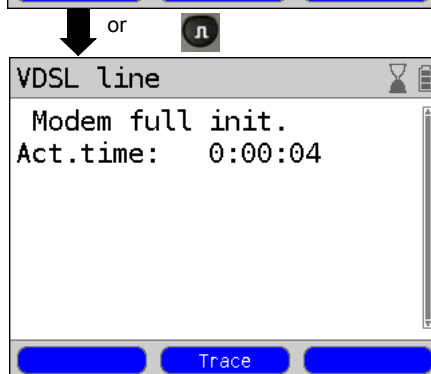
<Profile> Profile settings are like those for ADSL, see page 22.



Setting Up a VDSL Connection

The ARGUS synchronizes with the DSLAM (the "Sync / L1" LED will flash and an element with a yellow background will be shown in the display).

The ARGUS will display the current connection status (in this example "Initialize") in the Layer 1 box (blue).

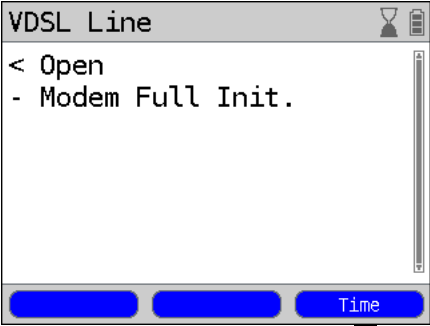


While setting up the connection:

Display:

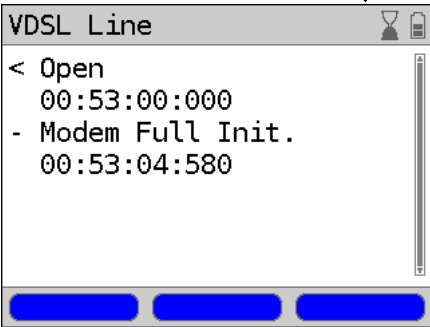
- Current connection status
- time elapsed since the start of synchronisation in h:min:sec.

Continuation on
next page




Command symbols:

- < = command sent from the ARGUS
- > = command sent from the DSLAM
- = connection status



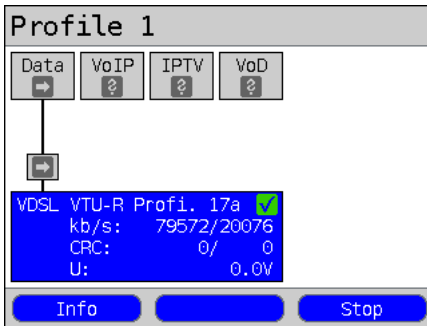
Display timestamp.

The ARGUS shows the time when the command arrived.

 Switch back to the previous display and the status screen.

Connection successfully setup

As soon as the connection has been setup ("Sync/L1" on constantly and a green check mark in the Layer 1 box), the ARGUS will determine the VDSL connection parameters. After the ARGUS has synchronized, please leave it connected to the VDSL access for at least another 20 seconds since the VDSL connection parameters supplied by the DSLAM cannot be stored in the ARGUS until this period of time has elapsed.



or



VDSL line		
Param.:	d/n	u/f
Bitrate	79572	20076
Att.bittr.	112717	26328
OutPower	+12.0	-17.9
FEC	0	0
CRC	0	0
Rated:	OK	OK
<div>Param. Trace Graph</div>		

ARGUS - status screen

Display:

- Default Profile (Profile 1)
- Access and Access mode
- VDSL Profile assigned by the DSLAM. The VDSL2 standard supports eight different "Profiles". Among other things these profiles specify the respective cutoff frequency, the interval between carrier frequencies as well as the signal strength generated. As a result of these definitions, it is possible that the maximum data rate attainable will vary from profile to another.
- d: Downstream data rate
u: Upstream data rate
- Number of CRC errors in upstream and downstream
- Interface's DC voltage

If the current data rate exceeds the rated value set, the ARGUS will display OK in the ARGUS-State, otherwise FAIL will be displayed.

<Info> display the VDSL connection parameters

<Stop> Clear down the ADSL connection



Scroll through the connection parameters.

<Trace> Display the trace data, see page 31

<Graph> Display the result graphs

8 Operation on an SHDSL Access

On an SHDSL access, the ARGUS supports the following Transmission Convergence (TC) layers, which can be selected in the Access mode menu.

ATM/EFM:

STU-R	(STU-R: SHDSL Transceiver Unit-Remote) The ARGUS simulates the customer side (the modem) and the PC based on ATM or EFM.
STU-C	(STU-C: SHDSL Transceiver Unit-Central Office) The ARGUS simulates the central office side (the DSLAM) based on ATM or EFM.
STU-R Bridge	The ARGUS simulates the customer side (the modem) based on ATM or EFM. In Bridge mode, the ARGUS replaces the SHDSL modem and passively passes on all of the ATM or EFM packets sent back and forth between the Ethernet side and the SHDSL interface.
STU-R Router	The ARGUS simulates the customer side (the modem) based on ATM or EFM. In Router mode, the ARGUS replaces both the modem and the router. In doing so, it will route all of the packets between the Ethernet and SHDSL interface with or without NAT.

TDM:

STU-R	(STU-R: SHDSL Transceiver Unit-Remote) The ARGUS simulates the customer side (the modem) based on TDM.
STU-C	(STU-C: SHDSL Transceiver Unit-Central Office) The ARGUS simulates the central office side (the DSLAM) based on TDM.

ITC:

STU-R	(STU-R: SHDSL Transceiver Unit-Remote) The ARGUS simulates the customer side (the modem) independent of the TC sublayer of the remote end.
STU-C	(STU-C: SHDSL Transceiver Unit-Central Office) The ARGUS simulates the central office side (the DSLAM) independent of the TC sublayer of the remote end.



The individual SHDSL tests record and store data (e.g. in a trace of IP data). The user must comply with the statutory regulations governing the collection and storage of such data and his obligation to give notice in this connection.



Basically, the ambient temperature range found in the "Technical Data" apply to operation on an SHDSL access. However, even if the ambient temperature is less than 50°C (120 °F) if the ARGUS is run in a high performance mode for a long time, it is still possible that the protective features of the ARGUS - described in "Warning and Safety Notes" - may still shut it down to protect it against overheating.

8.1 Setting the SHDSL Interface and Access Mode

The SHDSL interface and Access mode are configured in the same manner as on an ADSL access, see page 20 et seq.

8.2 The ARGUS in the STU-R Access Mode

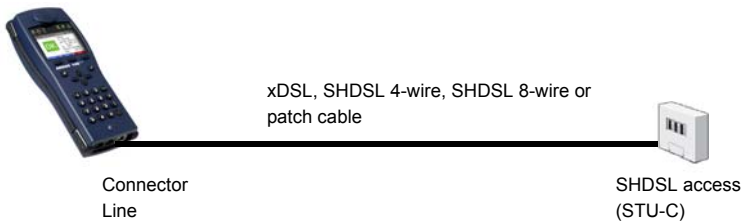
Determining the SHDSL connection parameter

The ARGUS is connected to the SHDSL access directly using the included (xDSL (2-wire), SHDSL 4-wire or the SHDSL 8-wire) banana plug cable or patch cable (n-wire).

In this case, the ARGUS replaces both the modem and the PC. The ARGUS will set up an SHDSL connection and determine all of the relevant SHDSL connection parameters. The ARGUS displays the SHDSL connection parameters and saves them after the connection is cleared down if desired.



Use only the cable included in the package!



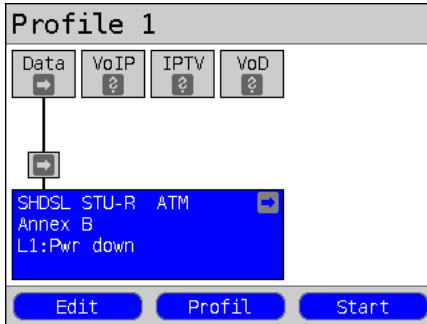
Setting the STU-R access mode:

The VTU-R access mode settings are configured in the same manner as those for ATU-R, see page 24.

Setting Up an SHDSL Connection:

Profile settings:

When setting up the SHDSL connection, the ARGUS uses the settings saved in the profile (see page 35).



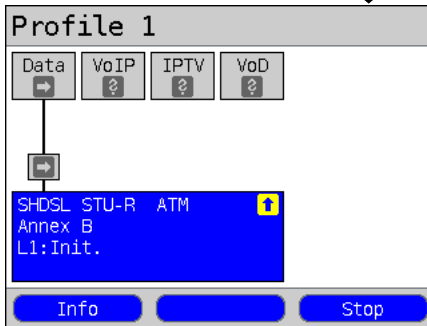
ARGUS - status screen:

In this example, the Access mode is set to STU-R, ATM.

The ARGUS will use the default (preset) profile to setup the SHDSL connection (in this example, Profile 1).

<Edit> Open the access parameters, see page 22

<Profile> Profile settings are like those for ADSL, see page 22



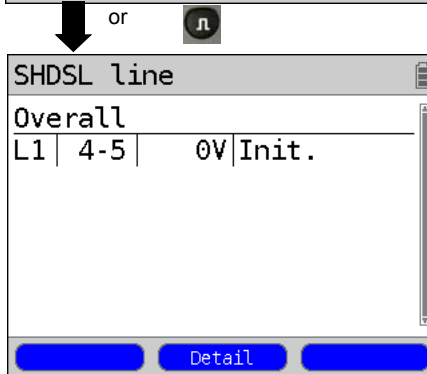
Setting Up an SHDSL Connection

The ARGUS synchronizes with the DSLAM (the "Sync / L1" LED will flash and an element with a yellow background will be shown in status).

The ARGUS will display the current connection status (in this example "Init") in the Layer 1 box (blue).

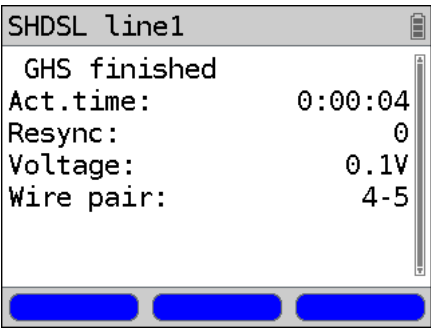
Display:

- Default Profile (in example, Profile 1)
- Access and SHDSL mode
- TC sublayer
- Spectrum / Clock (synchronous)
- Status per Line
(in example, L1=Line 1)




<Detail> Open a detailed presentation of the test results

Continuation on next page



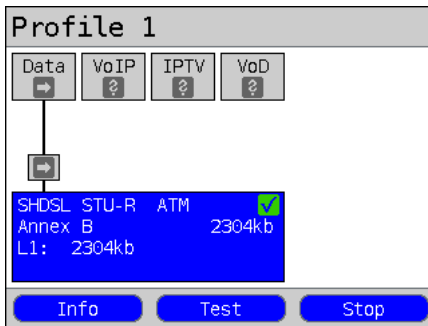
In the event that there are synchronisation problems, compare the SHDSL settings in the profile with the corresponding settings of the remote end.

The ARGUS displays the connection states, the duration of the activation, the number of resyncs, the voltage and the wire pair used.

 Switch back to the previous display and the status screen.

Connection successfully setup

As soon as the connection has been setup ("Sync/L1" on constantly and a green check mark in the Layer 1 box), the ARGUS will determine the SHDSL connection parameters. After the ARGUS has synchronized, please leave it connected to the SHDSL access for at least another 20 seconds since the SHDSL connection parameters supplied by the DSLAM cannot be stored in the ARGUS until this period of time has elapsed.



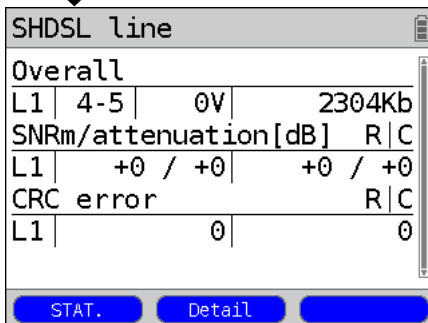
ARGUS - status screen.

Display:

- Default Profile (Profile 1)
- Access and SHDSL mode
- Spectrum / Clock (synchronous)
- Status
- Data rate (Σ over all lines)
- Data rate by line (in example, L1)

If the current data rate exceeds the rated value set, the ARGUS will display OK in the ARGUS-State, otherwise FAIL will be displayed.

- <Info> Display the SHDSL connection parameters
- <Test> Display the available tests
- <Stop> Clear the SHDSL connection down



The ARGUS will display a summary of the most important parameters.




Scroll through the parameters

- <STAT.> Display the ATM statistics

Continuation on
next page

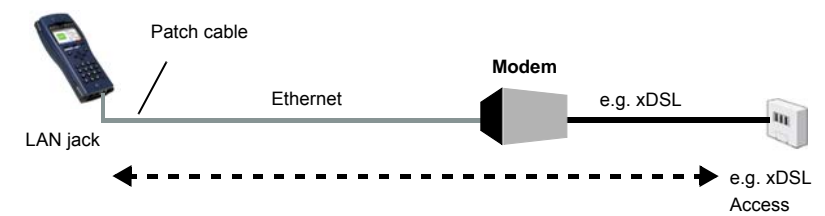
9 Operation on an Ethernet Access

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

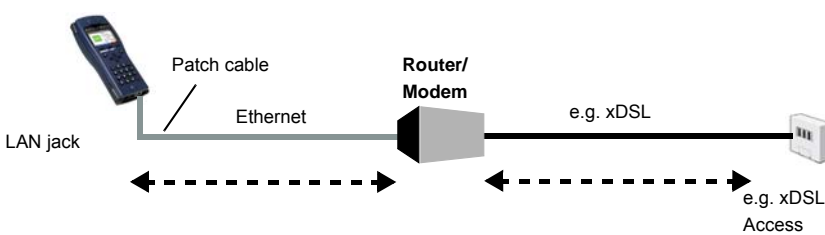


The individual tests record and store data. The user must comply with the statutory regulations governing the collection and storage of such data and his obligation to give notice in this connection.

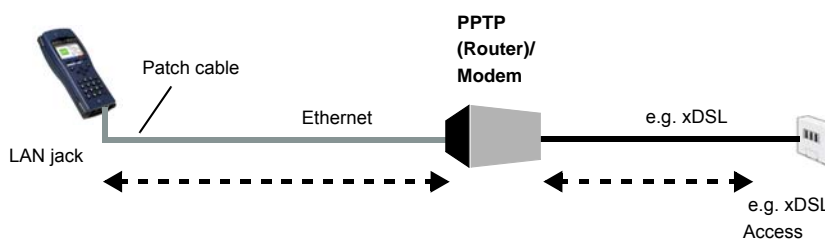
Connection to a modem:

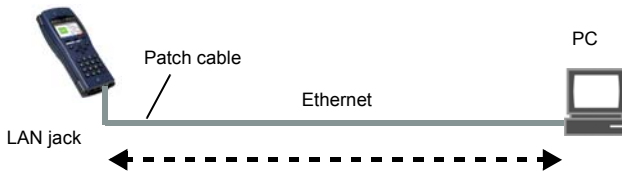
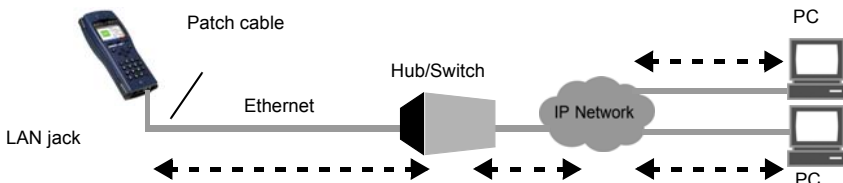


Connection to a Router/Modem:



Connection to a PPTP Router/Modem:



Connection to a PC via IP**Connection to an IP network**

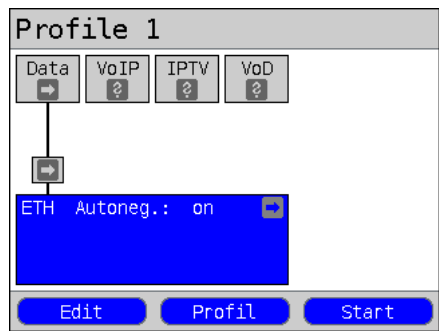
Settings in the profile:

Access parameters	
Ethernet	Autonegotiation On / Off
MAC address	Standard MAC address, dynamic MAC address or user-defined MAC address.

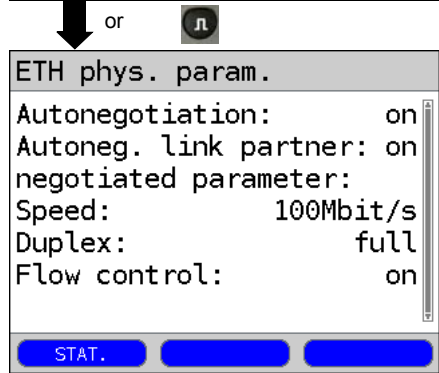
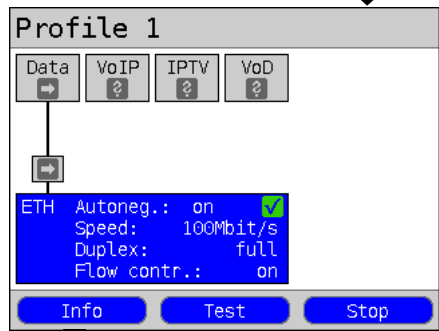
9.1 Setting the Ethernet Interface and Access Mode

The Ethernet interface and Access mode are configured in the same manner as an ADSL access, see page 20.

9.2 Setup an Ethernet connection



Setup an Ethernet connection.



ARGUS - status screen

The ARGUS will use the default (preset) profile to setup the Ethernet connection (in this example, Profile 1).

The Ethernet test is not yet started!

The meaning of the arrow in the Layer 1 box:

- grey arrow no test started
- yellow arrow test started
- green check mark A connection has been setup.

- <Info> Display the Ethernet connection parameters
- <Test> Display the tests possible
- <Start> Activate Ethernet
- <Stop> Disable the Ethernet connection

Display:

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

<STAT.> Open Ethernet statistics

10 Virtual Lines (VL)

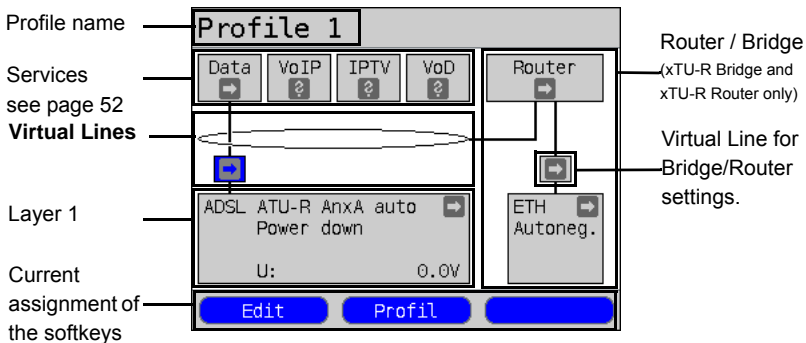
Virtual Lines (VL) are used to gather the settings for Layer 2 and Layer 3 into a profile, the VL Profile. These profiles can hold information about, for example, the protocols, VPI/VCIs, VLANs and PPP data (in their own subordinate PPP profiles). With the aid of Virtual Lines, it is possible to perform tests on multiple VPI/VCIs or VLANs and various protocols.

Up to 10 Virtual Line profiles can be saved in the ARGUS. The settings in a VL profile, for example, the protocol setting, can be edited. Regardless of the state of the physical layer (Layer 1), the VL profile can be assigned to one or more services.

Therefore, it is possible to run a data test (such as an IP ping test) and a VoIP test (like a VoIP call) on the active access without having to setup Layer 1 again - in spite of the fact that the protocols are different.

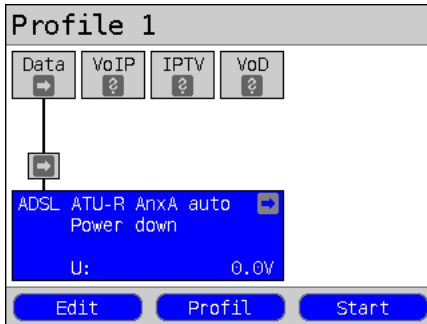
10.1 Virtual lines in the status screen

Virtual lines in the status screen are explained below using an ATU-R Router ADSL access as an example:



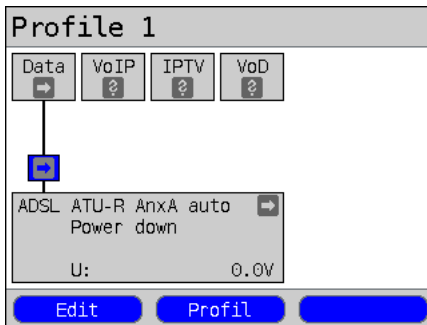
The status screen is organized in three levels, which can be accessed individually using the ARGUS cursor keys.

The status screen will be described in greater detail using three displays as examples.



Layer 1: Physics (see page 18):

- <Edit> Physical layer - configuration
- <Profile> Configure profile
- <Start> Setup the physical layer for the selected access.



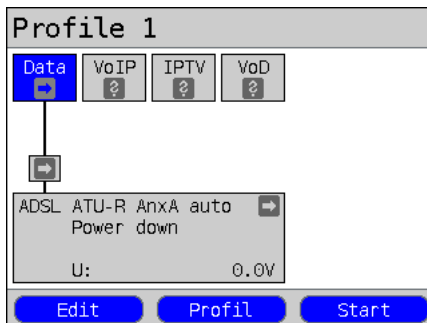
Layer 2: Virtual Lines:

- <Edit> Virtual Line - configuration, see page 47

The following configuration options are displayed:

- Protocol
- ATM
- VLAN
- PPP
- PPTP
- IP
- Data Log
- Profile name

- <Profile> Configure profile



Layer 3: Services (see page 52):

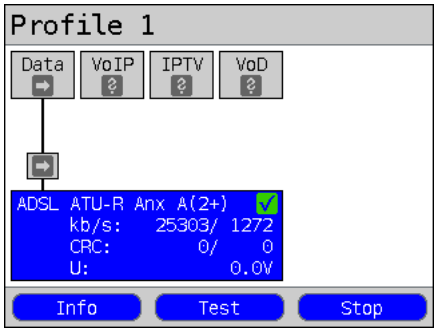
- <Edit> Assign a service to the VL and configure it
- <Profile> Configure profile
- <Start> Start service

Press the <start> softkey to start both the virtual line and the physical layer.

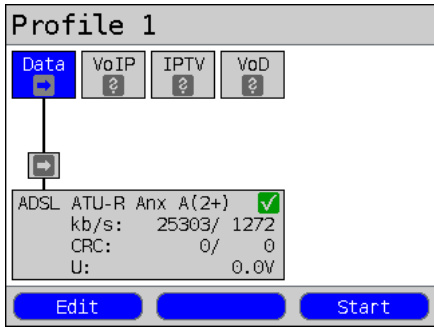
10.2 Virtual Line Activation

In order to activate a virtual line, a service or test must first be started. In order to start a test, a service must first be configured and assigned a virtual line. In this example, the Data service has been configured and assigned a virtual line.

10.2.1 Start a service



The ADSL connection is active.

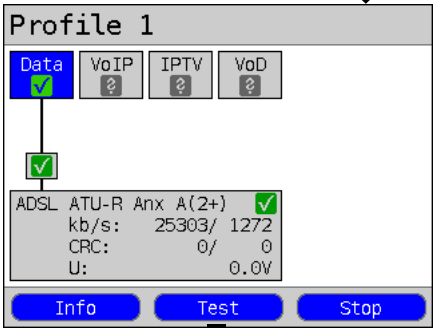


Using the cursor keys, move from the Layer 1 box over the virtual line to the "Data" service.



If the physical layer is not yet active, it will be started automatically when the service or test is started.

<start> Start service



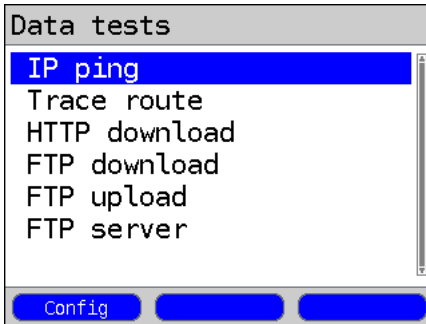
Now the physical layer (ADSL), the virtual line, and the "Data" service are all active. This is indicated by the green "check marks".

<Info> The Data service information will be displayed (e.g. the duration of the activity).

<Stop> The Data service will be stopped.

Continuation on next page

For an explanation of the services, see page 52.

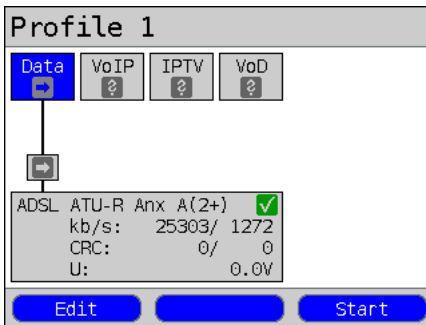


The tests that can be run on the "Data" service will be displayed.

<Config.> Configure the settings of the respective test (in this example, IP ping). For more details, see the chapter on Tests (page 63).

10.2.2 Assigning additional virtual lines

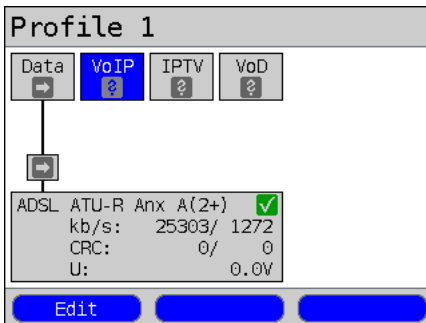
The ARGUS can use multiple services (e.g. Data and VoIP) with a single virtual line. In this example, ADSL is active. The Data service has been selected. In the following, we will explain how multiple services can be connected using a single virtual line.



In order to configure a virtual line (which is connected the Data service in this example) for use with other services, its current service must first be stopped. The physical layer remains active.



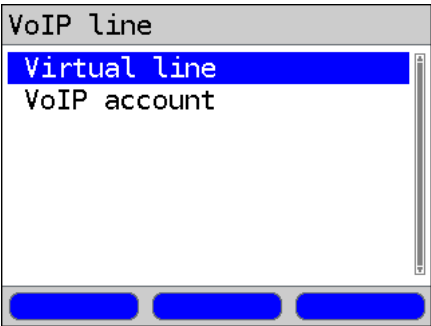
Use the cursor keys to select the VoIP service



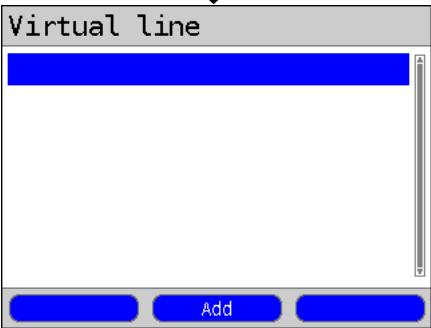
<Edit> The settings for the selected service (in this example, VoIP) will open.



Continuation on next page

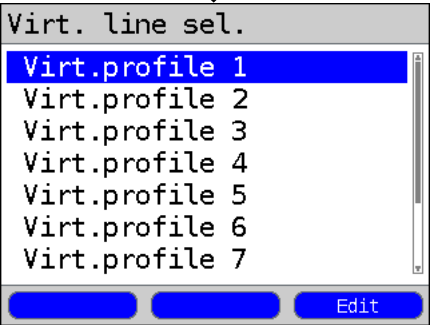


Select "Virtual line".



Since the VoIP service has not yet been assigned a virtual line profile, the list is first empty.

<Add> Open the virtual line selection



Select a virtual line profile for editing. The selected profile will be marked blue in the display.



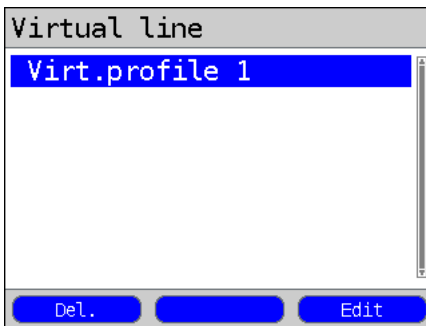
Elements that are not available will be grayed out. For example, when they are currently active.

<Edit> Edit the selected virtual line profile

Select the virtual line profile for the service.



Continuation on next page

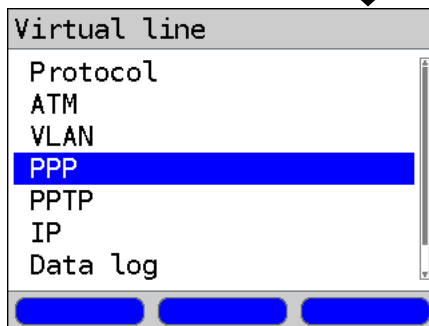


The selected virtual line profile will be displayed.

<Edit> Edit the selected virtual line profile.

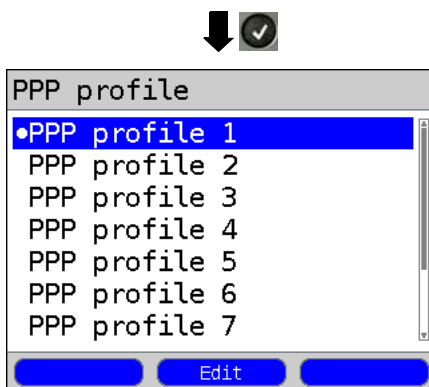


Assigning the virtual line profile to the service, see page 51.



e.g. select PPP

Open the PPP profile list



e.g. select PPP profile 1

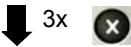
Up to ten PPP profiles can be configured.

<Edit> Edit the selected PPP profile

Continuation on
next page

PPP

User name
Password
Set IP
Activation delay
Profile name



Return the previous menu and to selection of the virtual line profile.

Virtual line

Virt.profile 1

Del. Edit

After confirming your selection, the selected profile must be confirmed once more.

The ARGUS will use the selected profile.



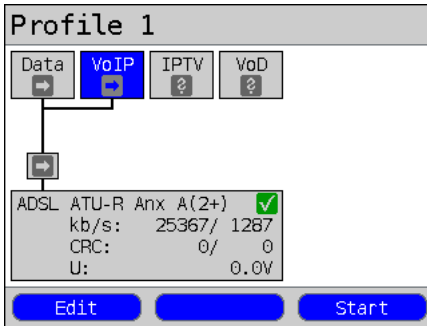
VoIP line

Virtual line
VoIP account

The ARGUS will open the status screen or Settings menu (depending on whether you opened the profile from the Main menu or the status screen).

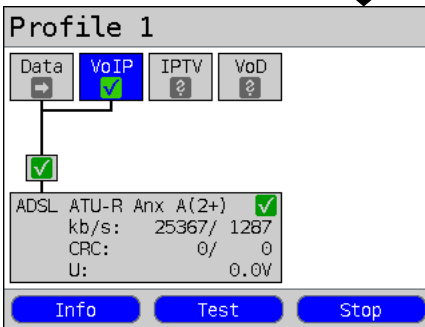
Continuation on
next page





The "Data" and "VoIP" services are now connected to the physical layer (ADSL access) by single virtual line.

<start> Start VoIP service

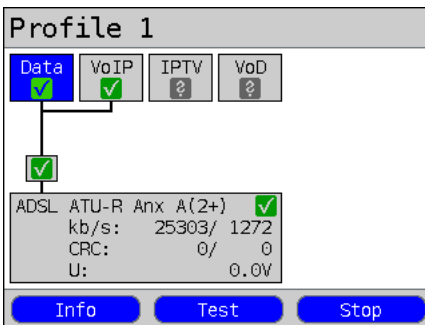


The "VoIP" service is now active. It is now possible to perform a variety of VoIP tests (see page 77 et seq.).

In the next step, it is now possible to activate another service, e.g.:



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



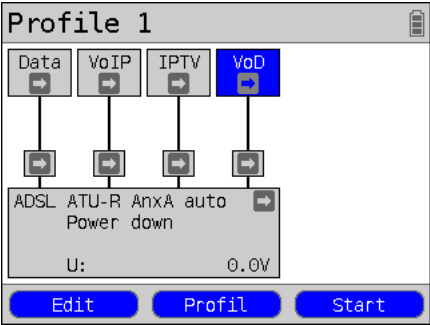
The "Data" and "VoIP" services are active. It is now possible to perform various Data tests (see page 63 et seq.) as well as VoIP tests (see page 77 et seq.).

Displays and operation for IPTV and VoD (Video on Demand) are like those for VoIP.

11 Services

Four services are presented on the status screen (see explanation on page 44). There is an entire group of IP tests that can be performed for each Service (see the table below). Furthermore, it is possible to start and stop virtual lines and the physical layer for each service independently of the other services.

An example of the display with the possible services.



- <Edit> To assign the service a virtual line (VL) profile and configure the service
- <Profile> Configure profile
- <Start> Activate service. If the virtual line and physical layer are not yet activated, they will also be started automatically.

If a service is started, a variety of tests can be started with <Test>. The tests that can be performed for the various services are as follows:

Services:			
- IP ping - Trace route - HTTP download - FTP download - FTP upload - FTP server	- IP ping - Trace route - VoIP call - VoIP wait - VoIP PESQ test	- IP ping - Trace route - IPTV - IPTV scan - MDI analysis	- IP ping - Trace route - IPTV

12 Loop

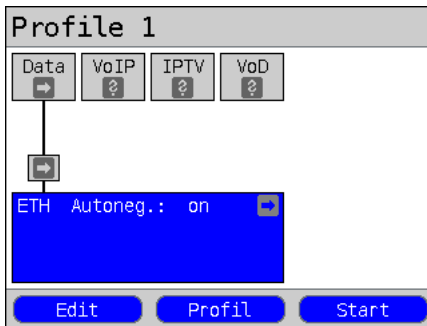
A Loop can be setup on an SHDSL line (in EFM), as well as on an Ethernet line.

A Loop will take all incoming Ethernet frames at Layer 1 (L1) and send them back to the sender unchanged.

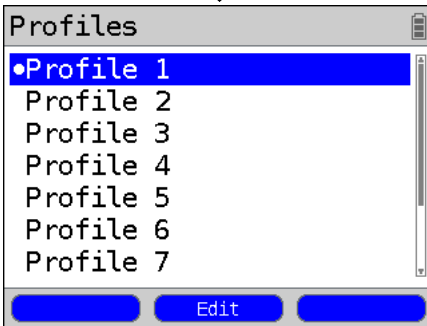
In the case of a Loop on Layer 2 (L2) of the OSI model, the ARGUS swaps the source MAC address with the destination MAC address and then sends all the incoming Ethernet frames back.

The following parameters are required for the Loop:

Protocol-independent parameters:



ARGUS - status screen



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

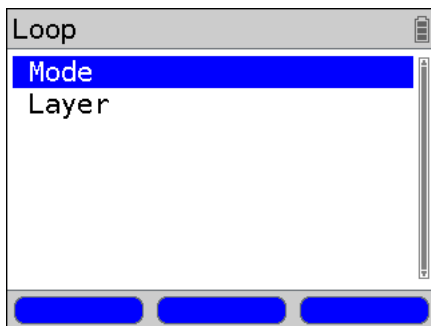
The ARGUS will use the marked profile as the default profile and return to the Settings menu.

Test parameters



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

Continuation on
next page

**Configuration**

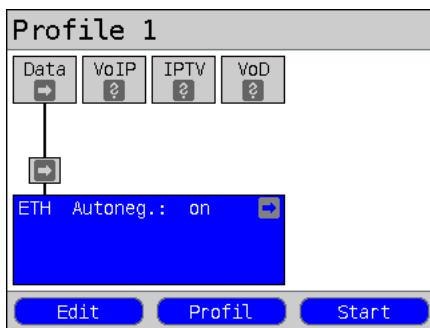
- Mode
 - Layer
- select and edit as desired.



Quit the menu without saving the changes.



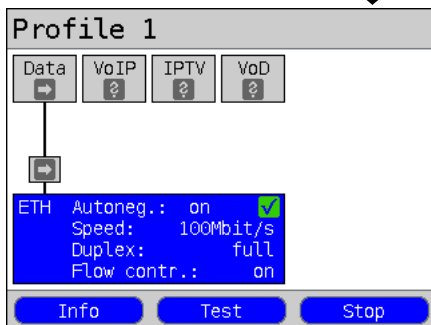
View and edit the marked parameters if necessary

Start Loop (in this example: Ethernet)

Setup the Ethernet or SHDSL connection

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

<start> Activate Ethernet.

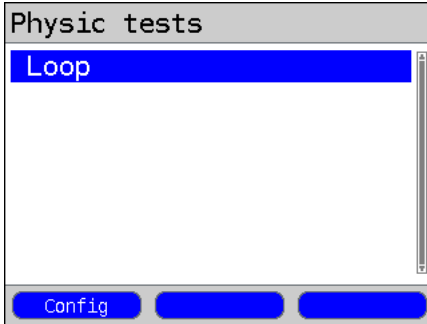


<Info> Display the Ethernet connection parameters

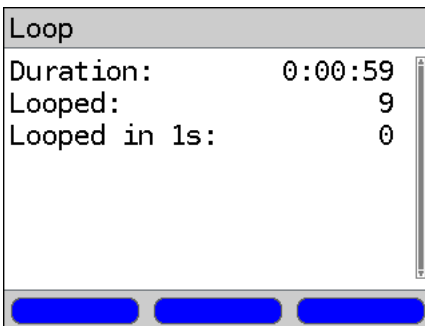
<Test> Display the tests possible

<Stop> Stop the Ethernet connection

Continuation on next page

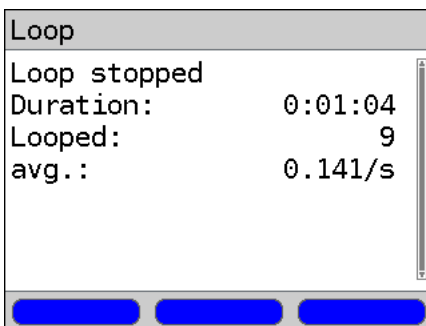


<Config.> The ARGUS will display the test parameters for the Loop test



The Loop is started:

Duration	Current Duration Test
Looped	Number of packets looped so far
Looped in 1 sec.	Number of packets looped in the current second



Duration	Total test time
Looped	Number of packets looped
avg.:	Number of packets looped per second



Durging loop testing (access mode SHDSL), the statistics are not continued. Only after finshing the test the ARGUS continues the statistics.

13 ATM Tests

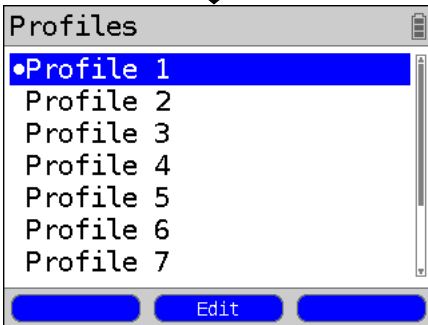
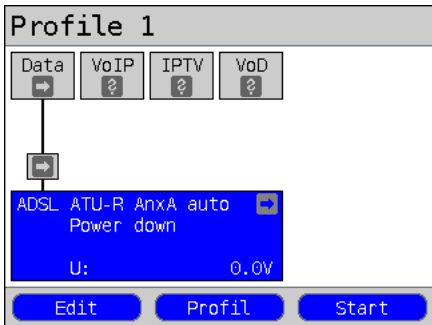
The following ATM tests can only be performed on an ADSL or SHDSL (ATM) access. Other interfaces, such as VDSL, Ethernet or SHDSL-EFM are not based on ATM technology.

13.1 VPI/VCI scan

In a VPI/VCI scan, the ARGUS checks which VPI/ VCI combinations are active on the access under test: The ARGUS will send a test packet for each of the possible VPI/VCI combinations and wait for a packet in response.

The following parameters, which are stored in a profile, are required to perform a VPI/VCI Scan (if a xDSL connection has already been setup, the connection parameters, e.g. the ADSL mode and the target value, are blocked):

Protocol-independent parameters:



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



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

Continuation on
next page

Test parameters



VPI/VCI scan



VPI/VCI Scan

VPI


VCI

Number of scans

Timeout

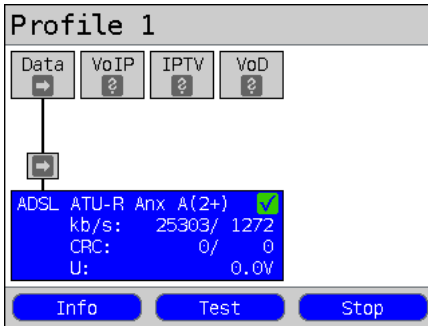
[Three blue buttons]

Marked
parameter - edit and
change if necessary



VPI/VCI scan:	
VPI	(Virtual Path Identifier) This sets the VPI range, which the ARGUS will check during the VPI/VCI scan. Range: 0 to 255 Default setting: 0 to 8
VCI	(Virtual Channel Identifier) This sets the VCI range, which the ARGUS will check during the VPI/VCI scan. Range: 32 to 65535 Default setting: 32 to 48
Number of scans	The number of scans. Range: 0 to 99 Default setting: 2
Timeout	This sets the maximum amount of time that the ARGUS will wait for a response from an ATM network node to a test packet which it sent. Range: 0.1 to 9.9 seconds Default setting: 0.5 seconds

Starting a VPI/VCI scan

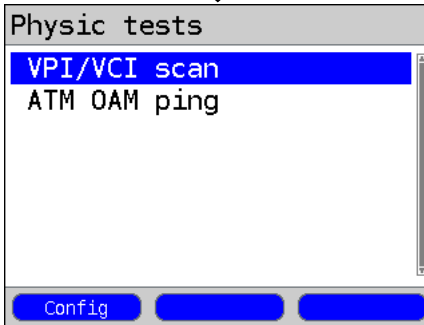


In the example, the access is set to ADSL and ATU-R is active.

<Info> Display the ADSL connection parameters

<Test> Display the tests possible

<Stop> Stop the ADSL connection

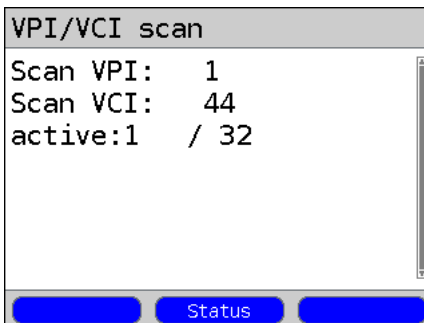


<Config.> The ARGUS will display the test parameters for the VPI/VCI scan an, see page 57.

Initialization

The VPI/VCI scan starts automatically.

VPI/VCI Scan



The ARGUS displays the VPI/VCI combination currently being tested and the last VPI/VCI combination that was found to be active (in the example, 1/32).

<Status> Display the status screen without stopping the test; see above



Cancel the test

VPI/VCI scan - results

VPI/VCI scan

Active			
VPI	1	VCI	32

Buttons: [] [Status] [New]

After the VPI / VCI scan has been concluded, the ARGUS will show the VPI / VCI combinations active on the access under test.

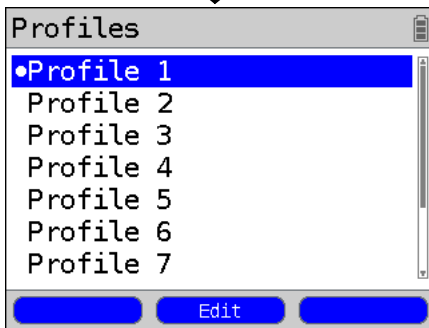
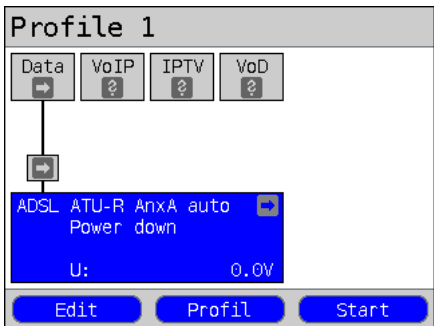
<Status> see above

<New> Starting a new VPI/VCI scan

13.2 ATM OAM ping

In an ATM OAM ping test, the ARGUS checks the availability of individual ATM network nodes or an ATM subnet. OAM is an acronym for "Operation, Administration and Maintenance" and is used for the monitoring and administration of ATM data transmissions. The following parameters, which are stored in a profile, are required to perform an ATM OAM ping (if an ADSL connection has already been setup, the connection parameters, e.g. the ADSL mode and the target value, are blocked):

Protocol-independent parameters:



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



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

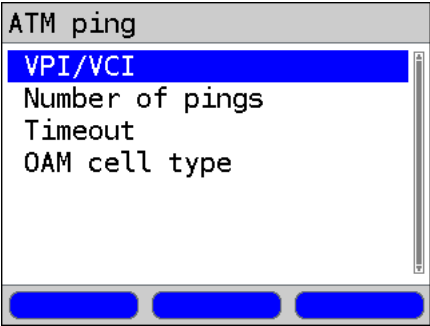
Test parameters



ATM OAM ping

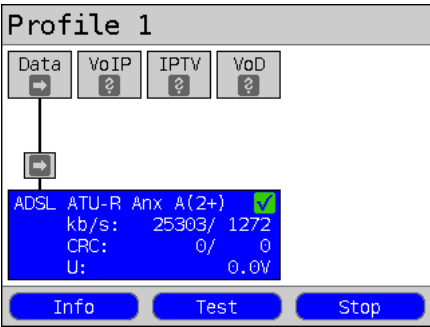


Continuation on
next page

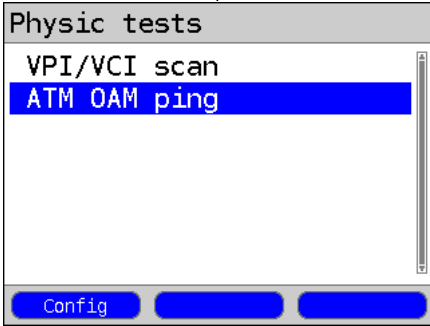


View and edit the marked parameters if necessary

Start ATM OAM ping



In the example, the access is set to ADSL and ATU-R is active.



- <Info> Display the ADSL connection parameters
- <Test> Display the tests possible
- <Stop> Stop the ADSL connection



<Config.> The ARGUS will display the test parameters for the ATM OAM ping.

The ATM OAM ping test will start automatically.

ATM OAM ping

ATM OAM ping	
Pings	
Sent	4
Received	4
VPI	1
VCI	32

The ARGUS will display the current number of test packets sent, the current number of packets in response and the VPI/VCI on which the ping test is currently being run.

<status> Display the ARGUS-State screen without stopping the test; see above



Cancel the test.

ATM OAM ping result

ATM OAM ping	
Pings	
Sent	30
Received	30
Lost	0

At the end of the ATM OAM ping, the ARGUS will automatically display the results. If the test has been set to "continuous", it must be stopped manually:

- Number of packets sent
- Number of packets received
- Number of packets lost
- Minimum packet round-trip delay
- Maximum packet round-trip delay
- Average packet round-trip delay

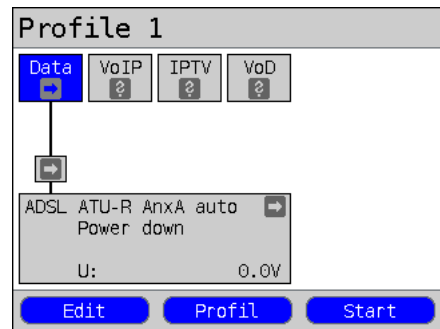
14 IP Tests

14.1 IP ping

In the IP ping test, the ARGUS checks whether it is possible to setup a connection to an Internet Service Provider (ISP) - or another computer or server address - via an Ethernet connection (IP network) or via an xDSL connection (over a DSLAM and the ATM/IP network): The ARGUS sends a test packet to a predefined IP address (remote site) and then waits for a packet in reply. Based on the received packet, it is possible to evaluate the ATM/IP network availability and delay. It is also possible to determine the path's maximum data packet size.

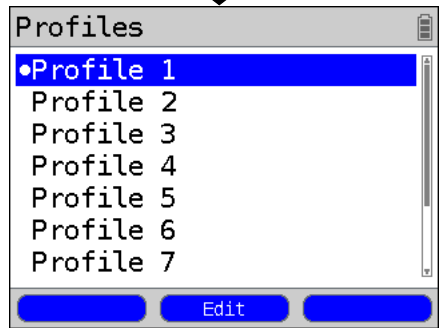
The following parameters are required for the IP ping:

Protocol independent parameters



ARGUS - status screen

- <Edit> Assign virtual lines to the Data service
- <Profil> Profile settings are like those for ADSL, see page 22
- <Start> Start service



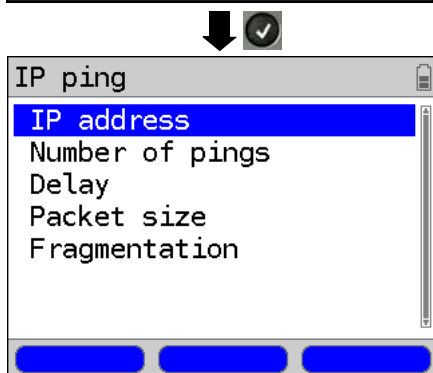
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet or xDSL connection and for the IP ping test.

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

Test parameters

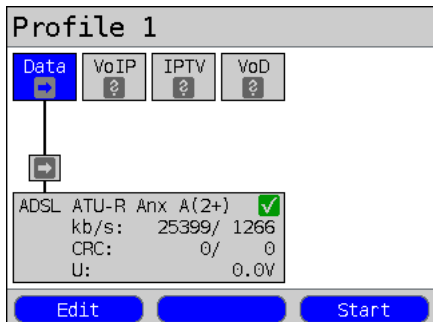
Continuation on
next page

IP ping



View and edit the
marked parameters if
necessary

Start IP ping (in the example, Access mode ATU-R, already active):



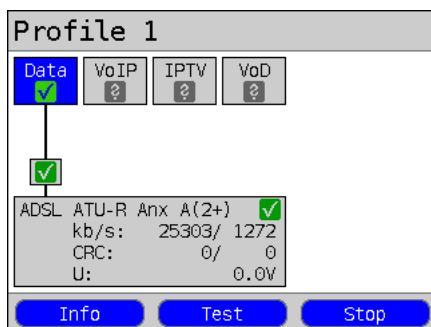
Setup the service

The profile displayed
(in this example, Profile 1) will be used for
the IP ping.

<Edit> Assign virtual lines to the Data
service.

Continuation on
next page

If no xDSL or Ethernet connection has
been setup, a connection will be setup
automatically at this point using the
default profile (see page 25).

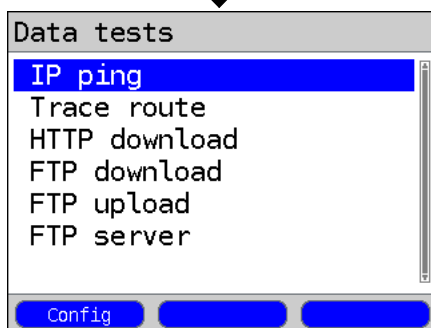


The Data service and ADSL connection are active.

<Info> Duration of the activation

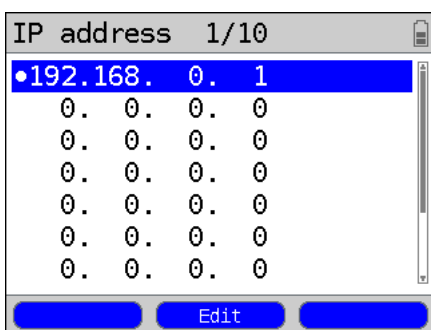
<Test> Open test selection

<Stop> Deactivate service



e.g. select IP ping

<Config.> Change the IP ping parameters, see page 64.



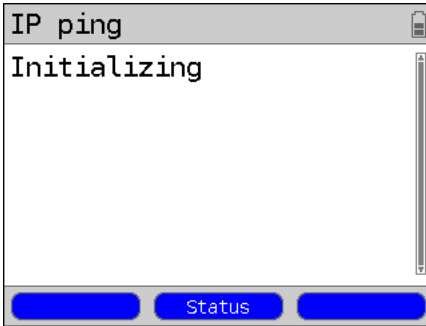
The ARGUS displays the IP address stored in the profile.



Select the IP address to use for the ping; the default address is marked with an ●.

<Edit> Edit the IP address

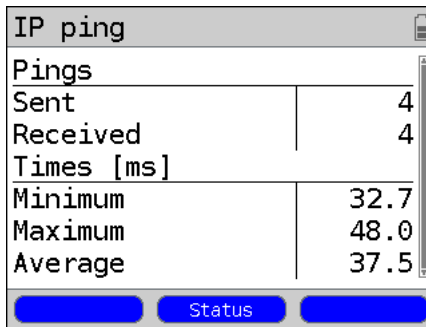
Continuation on
next page



Initialization

<Status> Display the status screen without stopping the test.

IP ping



The IP ping will start automatically.

During the IP ping, the display shows:

- Number of test packets sent
- The number of packets in reply
- Minimum time in ms
- Maximum time in ms
- Average time in ms

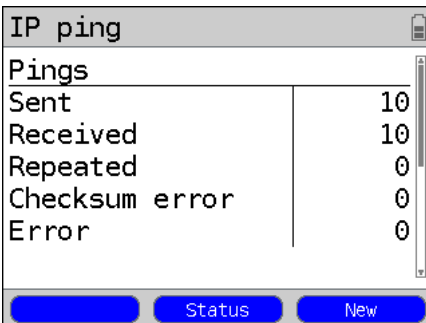
<Status> Display the status screen without stopping the test.



Cancel the test.

The ARGUS will display the results collected thus far and will inquire whether to save them.

IP ping results



After the test has run, the ARGUS will display the results:

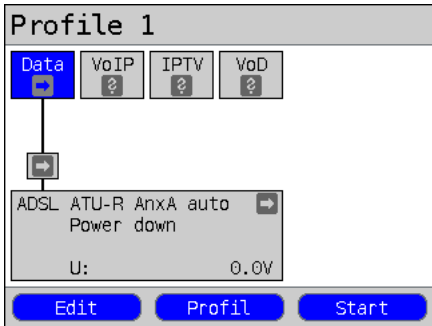
- Number of packets sent
- Number of packets received
- Number of packets sent again
- Checksum error
- Faulty packets received
- Minimum packet round-trip delay in ms
- Maximum packet round-trip delay in ms
- Average packet round-trip delay in ms

14.2 HTTP Download

In the HTTP download test, the ARGUS will attempt to download data from a web site or file. The ARGUS will display the current "net download rate" (the user data of the IP packets) and once the HTTP download is over the average speed (in the case of multiple download attempts).

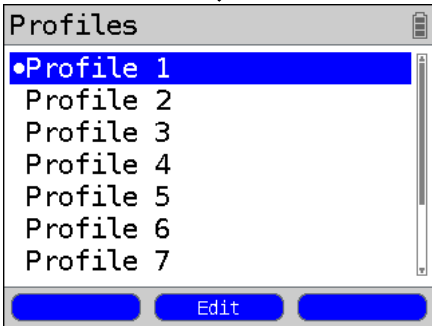
The following parameters (which are stored in the profile) are required for the HTTP download:

Protocol-independent parameters:



ARGUS - status screen

- <Edit> Assign virtual lines to the Data service
- <Profil> Profile settings are like those for ADSL, see page 22
- <Start> Start service




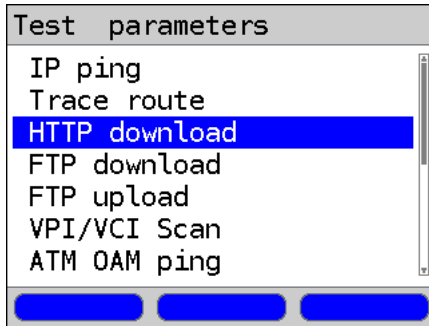
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet or xDSL connection and for the HTTP download test.

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

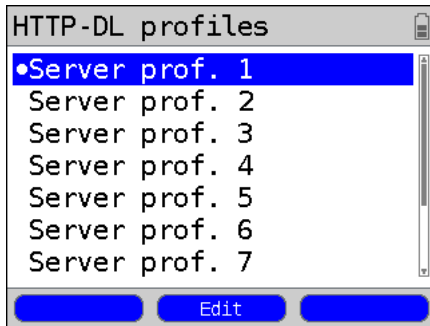
Test parameters

Continuation on next page

 Since it is not possible to accurately determine the transmission speed if the duration of the download test is less than 10 seconds, you should download a reasonably large file (taking into consideration the access speed).



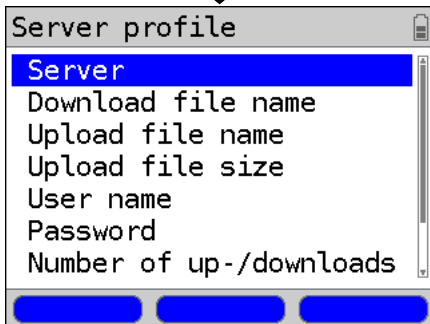
Select HTTP download



Ten user-defined server profiles are available which can also be used for both the FTP download and the FTP upload tests.

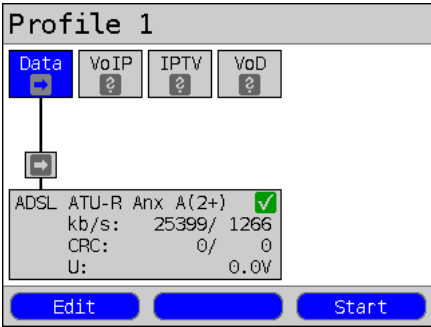


Edit the marked server profile



Edit the marked parameters if necessary

Start HTTP download (in the example, Access mode ATU-R, already active)

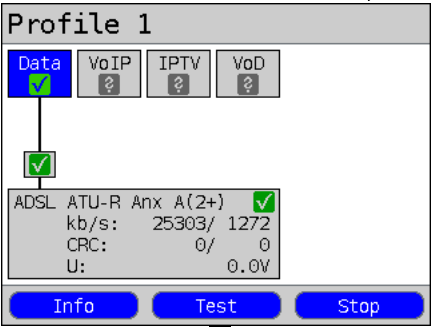


Setup the service

The profile displayed (in this example, Profile 1) will be used for the HTTP download.

<Edit> Add a virtual line to the Data service

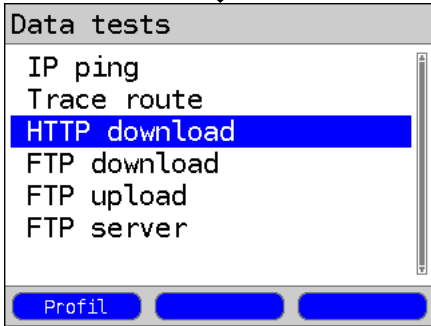
If no connection has been setup, a connection will be setup automatically at this point using the default profile (see page 25).




<Info> Duration of the activation

<Test> Open test selection

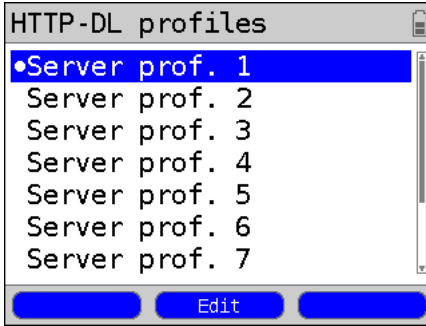
<Stop> Deactivate service



 e.g. select HTTP download

<Profile> Display the available HTTP download profiles profile, see page 68.

Continuation on next page

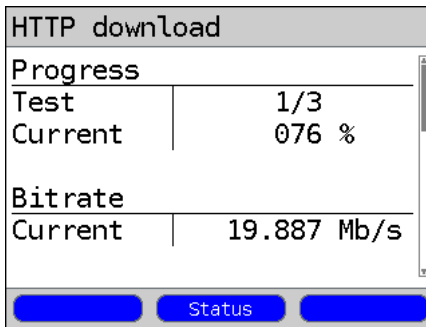


Select the server profile:
(The default is marked with an ●).

<Edit> Edit the marked profile.
Regarding the editing of the individual settings.

Initialization

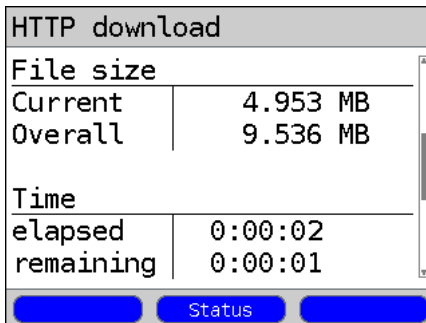
HTTP Download



The HTTP download will start automatically.

During the HTTP download, the display shows:


- Current download / Total downloads
In the example, the first download of a total of three attempts (1/3) is shown.
- Data already downloaded
(in the example, 76 %)
- Current net average download rate
(in the example, 19.887 Mbit/s)
- Currently sent bytes
(in the example, 4.953 MB)
- The size of the file sent
(in the example, 9.536 MB)
- Current loading time in h:min:s
- Remaining loading time in h:min:s
- Number of parallel downloads



HTTP download	
Bitrate	
Average	18.805 Mb/s
File size	
Overall	95.367 MB
Time	
Average	0:00:42
<div>StatusNew</div>	

- <Status>

Display the status screen without stopping the test.
- <New>

Start a new HTTP download
- 

Cancel the test

- Display results:
- calculated average speed of all of the downloads (in the example, 18.805 Mb/s)
 - Size of file downloaded (in the example, 95.367 MB)
 - average time required for a download in h:min:s.ms
 - maximum parallel downloads
 - configured parallel downloads

Both the FTP download and the FTP upload tests function similarly to the HTTP download test described before. This includes settings for the protocol independent parameters, the start of the down-/uploads and the display of the result.

14.3 FTP server

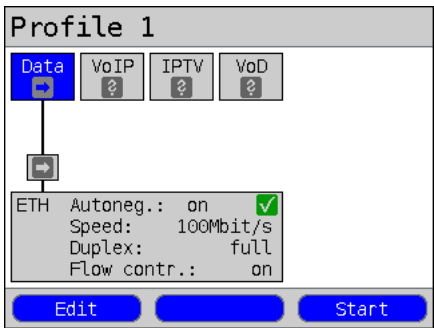
In FTP server mode, the ARGUS acts as a server for FTP requests. In this case, the ARGUS will handle both FTP download and upload requests. These requests can be sent by a second terminal (e.g. a second ARGUS) on an xDSL or Ethernet connection. In this manner, it is possible to perform an end-to-end test of the throughput and determine the highest average transfer rate possible for the connection.

The throughput test is illustrated in the following on an Ethernet interface. In this example, two ARGUS testers are used. One acts as an FTP server while the other ARGUS acts an FTP client requesting FTP downloads.

ARGUS 1 - FTP server

No settings need to be made on the ARGUS that acts as the FTP server. Simply start the FTP server single test on the selected interface.

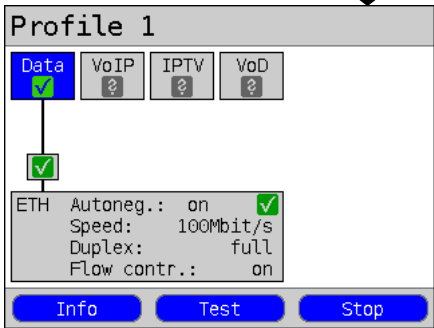
Start FTP server (in this example: Ethernet is already active)



Setup the service

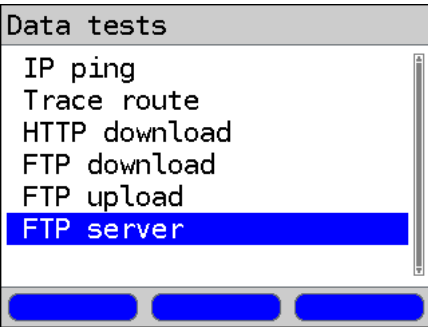
The profile displayed (in this example, Profile 1) will be used for the FTP server.

<Edit> Assign a virtual line to the Data service

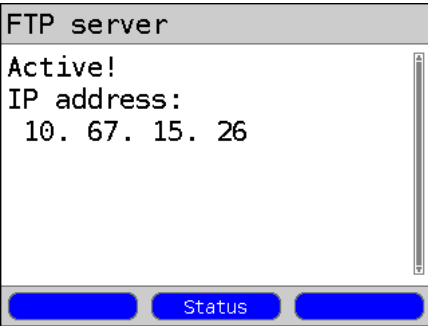


If no connection has been setup, a connection will be setup automatically at this point using the default profile (see page 44).

Continuation on next page



e.g. FTP server



The ARGUS will use the IP address entered in "own IP address" as the destination address (Server) for the second ARGUS.

<Status> Display the status screen without stopping the test.

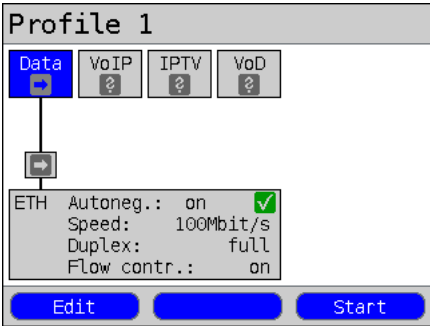
ARGUS 1 will now wait for an FTP request from a second terminal (in the example, a second ARGUS).
The IP mode in the example is "static", the IP netmask is in the default configuration.

ARGUS 2 - FTP download / upload

As far as the ARGUS that will issue the FTP requests (in this example, FTP download) is concerned, basically the same settings can be used as in the case of an FTP download test.

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

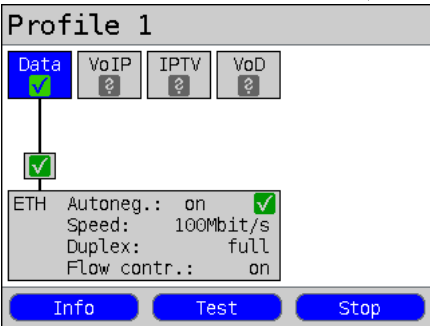
Start an FTP download:



Setup the service

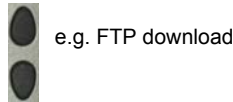
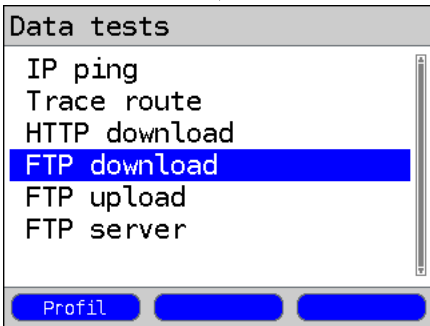
The profile displayed (in this example, Profile 1) will be used for the FTP server.

<Edit> Assign a virtual line to the Data service



If no connection has been setup, a connection will be setup automatically at this point using the default profile (see page 44).

<Info> Duration of the activation
<Test> Open test selection
<Stop> Deactivate service



<Profile> Edit FTP download parameters.

Continuation on next page

Select the server profile
(The default is marked with an ●).

<Edit> Edit the marked profile.
Regarding the editing of the
individual parameters.

In the server profile of ARGUS 2, just
enter the IP address of ARGUS 1 in the
Server IP address.

<Del.> Delete the character before
the cursor

Continuation on
next page

Download filename


File name:
1000000000

	Del.	12>ab
--	------	-------

Here the download file name is also the size of the file to be downloaded.
The download file name: 1000000000 equals a file size of: 1 GB



In the case of a Download test of less than 10 seconds, it is not possible to accurately determine the transmission speed. Consequently, it is advisable to upload as large a file as is reasonable to the server given the speed of the access.

Server profile

FTP-DL profiles
•Server prof. 1
Server prof. 2
Server prof. 3
Server prof. 4
Server prof. 5
Server prof. 6
Server prof. 7

	Edit	
--	------	--

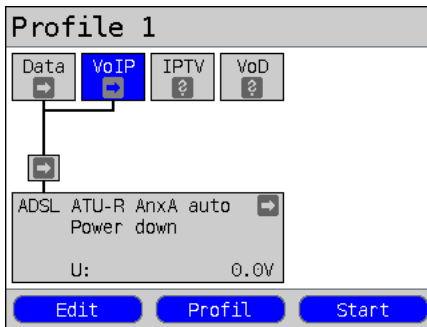
The FTP download will start automatically.



15 VoIP Tests

The ARGUS acts as a VoIP terminal with which a telephone (voice) call can be set up. The ARGUS uses the Session Initiation Protocol (SIP) as the signaling protocol for VoIP. VoIP calls can be set up with or without a registrar or proxy. The ARGUS can be used to setup a VoIP connection (DSL telephony) via xDSL or Ethernet. The MOS/R-factor of the RTP data stream will be determined and displayed as an evaluation of the voice quality. Three "VoIP Profiles" can be configured for use in VoIP telephony.

Protocol-independent parameters:

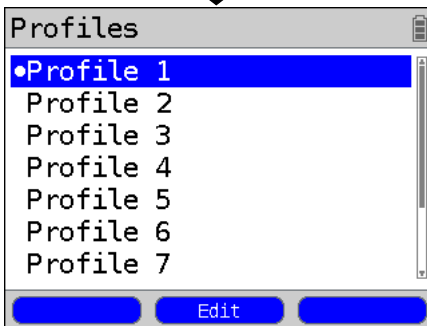


ARGUS - status screen

<Edit> Assign a virtual line to the VoIP service

<Profile> Profile settings are like those for ADSL, see page 22.

<Start> Start service



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



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

Access parameters



VoIP line

Continuation on next page



VoIP account



VoIP profile

- VoIP profile 1
- VoIP profile 2
- VoIP profile 3

A total of 3 user-defined VoIP profiles can be configured.

<Edit> Edit the VoIP profile.

Edit the marked profile.

VoIP service

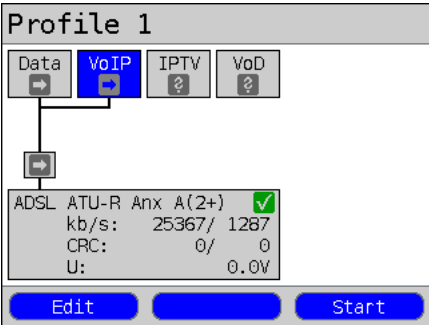
- SIP settings
- Phone settings
- STUN server
- MOS threshold
- Profile name

15.1 Start VoIP telephony

(Example: ADSL access already active)

Edit the marked parameters if necessary

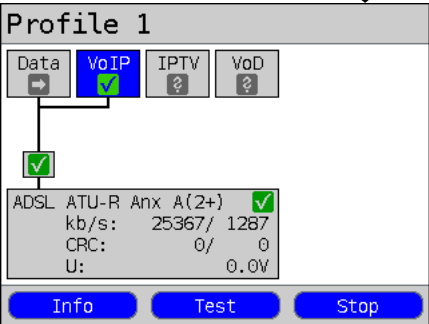




Setup the service

The profile used to set up the xDSL connection (in this example, Profile 1) will also be used for VoIP telephony.

<Edit> To edit the preset profile (in this example, Profile 1).

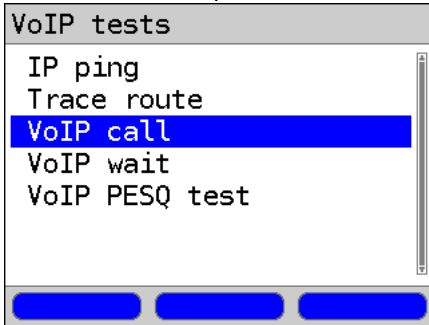


If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 25).

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service



e.g. select VoIP call

Continuation on
next page



VoIP dest. 01/10

90

Edit

Select VoIP destination
(The default is marked with an ●).

Move the cursor down to select an empty line and enter a new VoIP destination using <Edit>.

<Edit> Edit VoIP number

Initialization

VoIP call

CALL

Connecting!
From: 7087
To: 90

Status Volume

Set up a connection

The ARGUS will display its "own call number" (From: 7087) and the subscriber number called (To: 90). The subscriber called has not yet accept the call; the display shows "Connecting!" and a yellow "Call" icon.

VoIP call

OK

Connected!
0:00:02
MOS:4.3
Good
G.711 A-law
From: 7087
To: 90

Info Status Volume

The subscriber called has accepted the call; the display shows "Connected!". The ARGUS will determine the MOS value and will indicate whether the speech quality meets or exceeds the MOS threshold set - i.e. will display "OK" or "Fail". It will also show the duration of the connection and the currently used voice codec (in this example, G.711 A-law).

<Info> Display of the VoIP parameters

<Status> Display the status screen without stopping the test.

<Volume> Opens the volume setting

<Extern>: Headset operation

<Intern>: Handset operation

<OK>: Settings confirmed

Continuation on next page,
second screenshot.

Continuation on
next page

Volume

VoIP intern:
quiet-----loud

▲

Extern OK

Setting the volume, see page 80.

↓ <Info>

MOS info

MOS G.107

Current	4.3
Average	4.3
Minimum	2.3
Maximum	4.3
Ideal	4.3

RTP

Display MOS info:

- The evaluation of the MOS value in accordance with ITU-T P.800 (in this example: Good).
- Current MOS (Cur. MOS)
- Average MOS (Avg. MOS)
- Min./max. MOS value
- Ideal MOS (MOS possible without interference, depends on the codec)
- Current and average R Factor in accordance with ITU-T G.107.



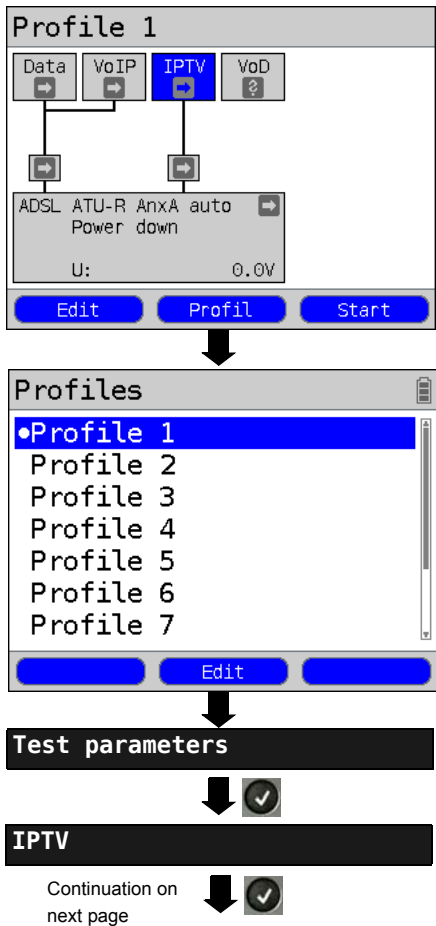
Return to the previous display.

16 IPTV Tests

16.1 IPTV STB Emulation

The ARGUS requests a data stream from a server (Depending on the type of access, the ARGUS will substitute for a settop-box (STB) or modem and STB) and checks the regularity of the incoming packets, the loss of packets and the programme's switch on or zapping time. Up to three user-defined "IPTV Profiles" can be configured (when the xDSL connection has already been setup the access parameters, e.g. the ADSL mode and the target value are locked):

Protocol-independent parameters:



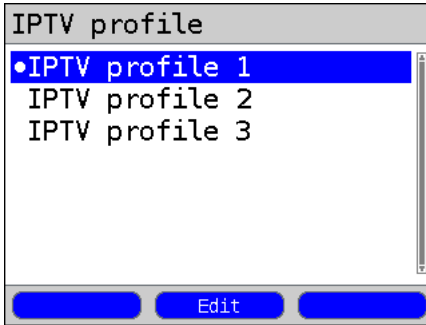
ARGUS - status screen

The IPTV STB Emulation can run under the "IPTV" or "VoD" service. The following example shows the procedure for the IPTV service and considers its special aspects. In principle, however, the procedure is identical for the VoD service.

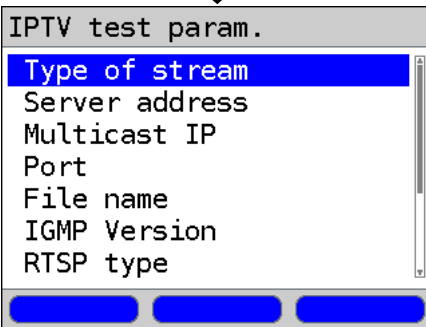
- <Edit> Assign virtual lines to the IPTV service
- <Profile> Profile settings are like those for ADSL, see page 22
- <Start> Start service

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

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



A total of 3 user-defined IPTV profiles can be configured.



Edit marked IPTV profile

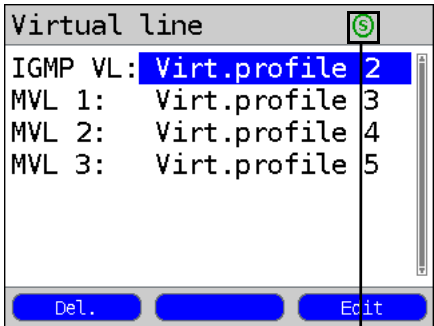
View and edit the
marked parameters if
necessary



16.1.1 Multiple Virtual Lines

The ARGUS can be configure up to 4 Virtual Lines for the IPTV service (only one Virtual Line can be configured for the VoD service). In this manner, it is possible to distribute the data streams in accordance with their priority. As an example, you could allocate VL 1 to handle text streams (IGMP), VL 2 to carry video data and use VL 3 to transport VoD data.

The selected Virtual Line Profile in the overview.

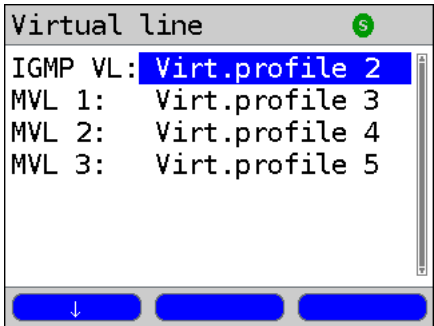


<Del.> Remove the selected virtual profile (in this example, Virt. Profile 1) from the list.

<Edit> Edit the selected virtual profile (in this example, Virt. Profile 1), see page 49.



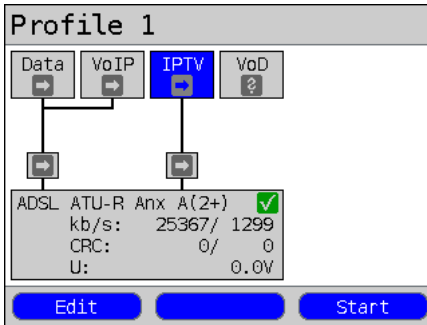
Switch between softkey sets



<↓> The marked profile will be moved down one place in the list.

<↑> The marked profile will be moved up one place in the list.

Start IPTV



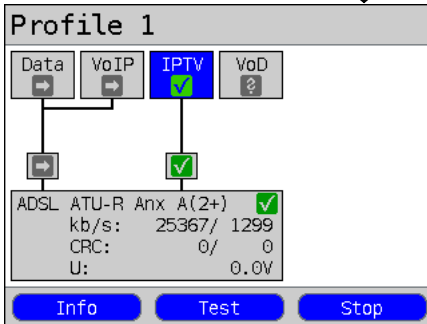
Setup the service

The profile used to set up the xDSL connection (in this example, Profile 1) will also be used for IPTV.

<Edit> The ARGUS will open the settings of the profile used to setup the connection (in this example, Profile 1).



Use the cursor to select and activate the IPTV service.

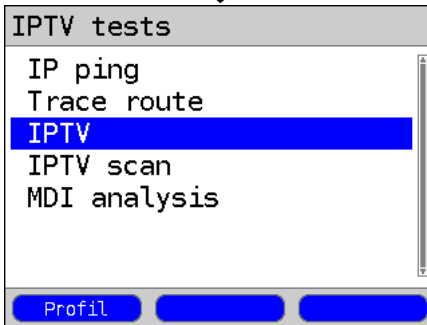


If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 25).

<Info> Duration of the activation

<Test> Open test selection

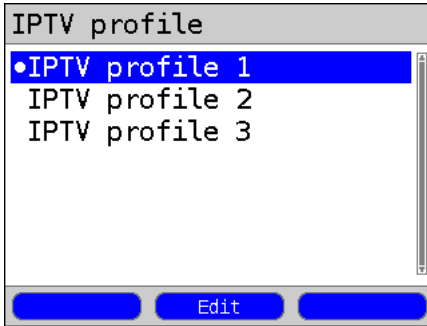
<Stop> Deactivate service



<Profile> Display the IPTV profile, see page 83.

Continuation on
next page



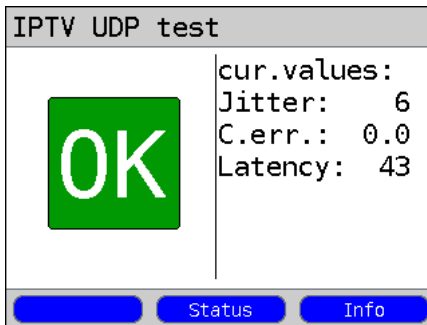


Select IPTV profile

(The default is marked with an ●).

<Edit> Edit the marked profile.
Regarding the editing of the individual parameters, see page 83.

IPTV test



The IPTV test will start automatically.

During the test, the ARGUS will displays the current PCR jitter, the Continuity Error Counter and the Latency. The latency (switch on time of the program) is only determined once. If the measured values exceed the limits in the settings, the ARGUS will report that the IPTV test failed (FAIL); otherwise it will display "OK". The PCR jitter and continuity errors are determined continuously. If one of the limit values set is exceeded, the ARGUS will display "FAIL" until the measured value returns to a value less than the limit value once again.

<Status> Display the status screen without stopping the test.



Cancel the test

IPTV results

IPTV	
Time	[s]
OK	398
Fail	36
PCR jitter	[ms]
Average	5
Maximum	24
<div> <div></div> <div>Status</div> <div>Info</div> </div>	

Displays how long the stream remained below thresholds set for the IPTV test (OK: in this example 398 seconds) or exceeded the thresholds (Fail: in this example 36 seconds).

Display Further information:

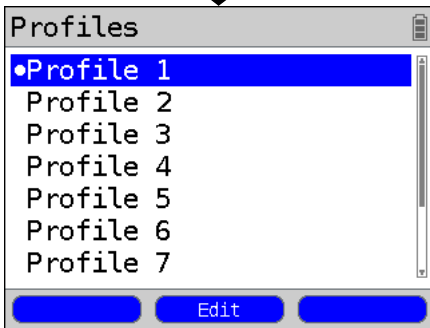
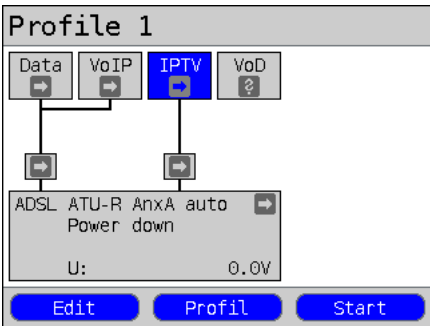
- The average and the maximum value of the PCR jitter
- The average and the maximum value of the continuity error
- IGMP latency in ms
- Container type
- Information regarding the data stream:
 - Packets
 - Bytes
 - Cont. Error
- Information regarding bitrates:
 - Average
 - Minimum
 - Maximum

16.2 IPTV scan

The ARGUS will check the availability of the TV broadcaster. The ARGUS will also show the zapping time between the TV broadcasters.

Up to three user-defined "Scan profiles" can be created. The following parameters, which are stored in a profile, are required to perform an IPTV scan (if a xDSL or Ethernet connection has already been setup, the connection parameters, e.g. the ADSL mode and the rated value, are blocked):

Protocol-independent parameters:



Continuation on
next page

ARGUS - status screen

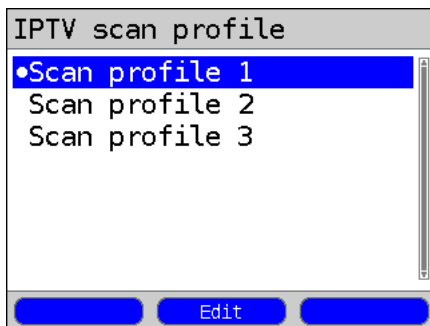
- <Edit> Assign virtual lines to the IPTV service.
- <Profile> Profile settings are like those for ADSL, see page 22.
- <Start> Start service



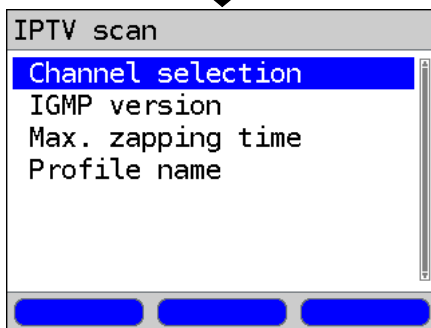
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet or xDSL connection and for the IPTV scan.



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



A total of 3 user-defined Scan profiles can be configured.

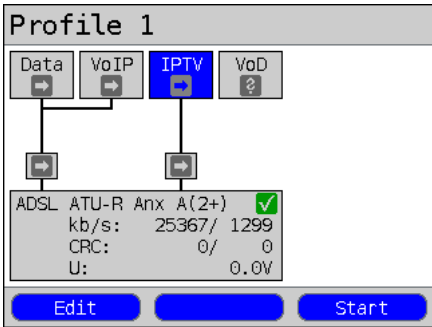


Edit the marked Scan profile.



View and edit the marked parameters if necessary

Start the IPTV Scan



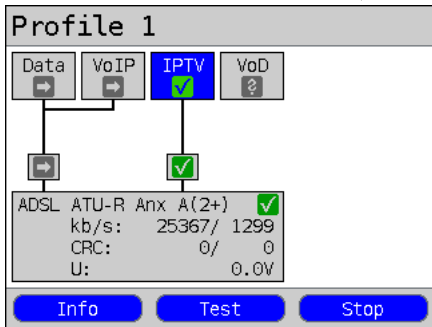
Setup the service

The profile used to set up the xDSL connection (in this example, Profile 1) will also be used for IPTV.

<Edit> The ARGUS will open the settings of the profile used to setup the connection (in this example, Profile 1).



Use the cursor to select and activate the IPTV service.

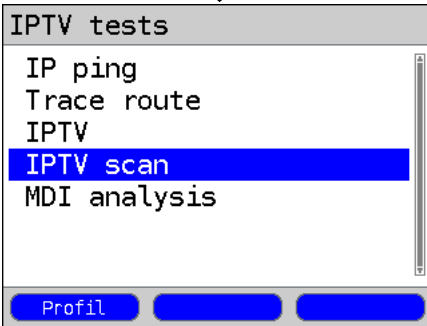


If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 25).

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service



<Profile> Display the IPTV scan profile, see page 89.

Continuation on
next page



Initialization

IPTV scan

IPTV scan	
Zapping time	[ms]
IPTV channel 1	36
IPTV channel 2	170
IPTV channel 3	216
Minimum	36
Maximum	216
Average	141
<div><div></div><div>Status</div><div></div></div>	

The IPTV scan starts automatically.

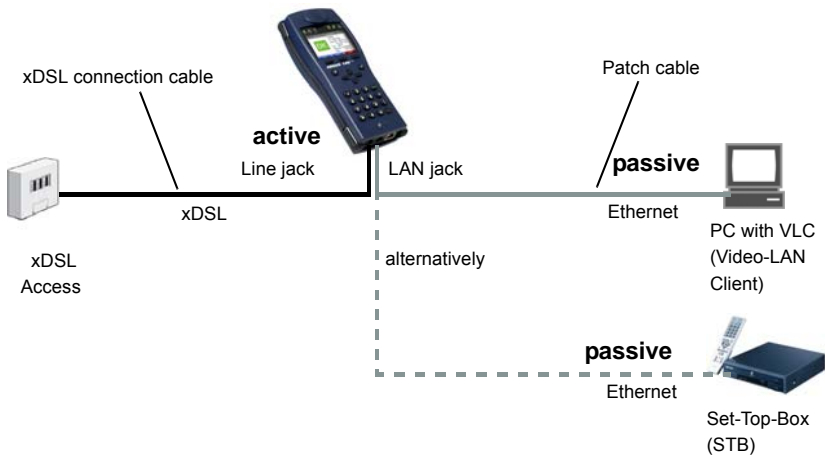
Display of the zapping time (time required to switchover) between the TV channels. If it is not possible to establish reception of a TV channel within the time period set, the ARGUS will display "Failed".

Display of the minimum, maximum and average zapping time.

<Status> Display the status screen without stopping the test.

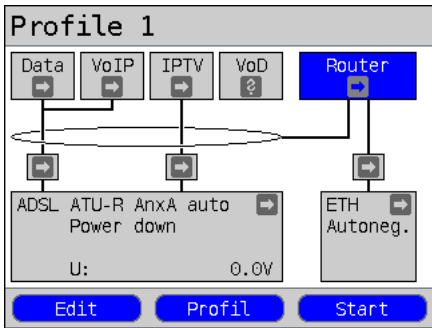
16.3 MDI analysis

The ARGUS will - actively or in bridge or router mode passively - analyse a UDP/RTP data stream (UDP: User Datagram Protocol, RTP: Real-Time Transport Protocol) and will determine the MDI (Media Delivery Index) in accordance with RFC 4445 and displays the Media Loss Rate and the Delay Factor.



The following parameters, which are stored in a profile, are required to perform a MDI analysis (if a xDSL or Ethernet connection has already been setup, the connection parameters, e.g. the ADSL mode and the threshold, are blocked):

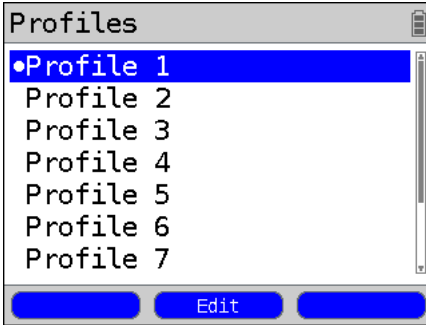
Protocol-independent parameters:



Continuation on
next page

ARGUS - Status screen

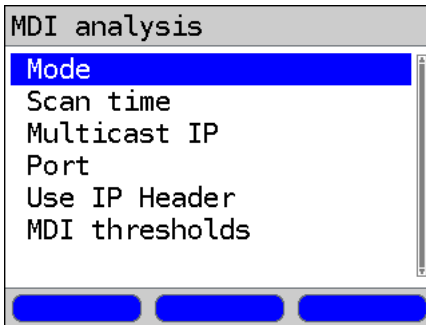
- <Edit> Assign virtual lines to the IPTV service
- <Profile> Profile settings are like those for ADSL, see page 22
- <Start> Start service



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

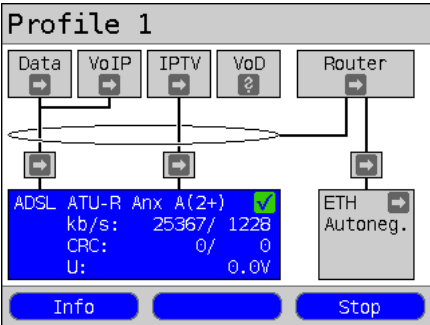


The ARGUS will use the marked profile as the default profile and return to the Settings menu.



Edit the marked parameters if necessary

Start the MDI analysis



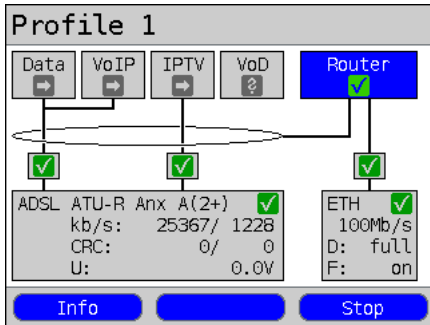
Use the cursor to select and activate the router.



Setup the service

The profile used to set up the xDSL connection (in this example, Profile 1) will also be used for MDI analysis.

<Edit> To edit the profile used for the xDSL connection (in this example, Profile 1).

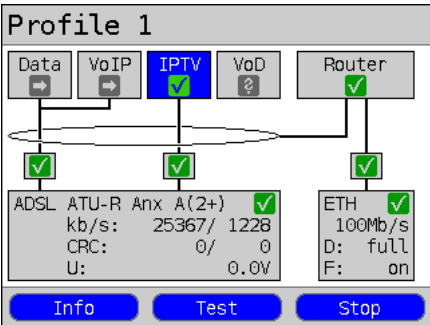


Router mode started

<Info> The duration of the router's activity will be displayed.

<Stop> Stop Router mode.

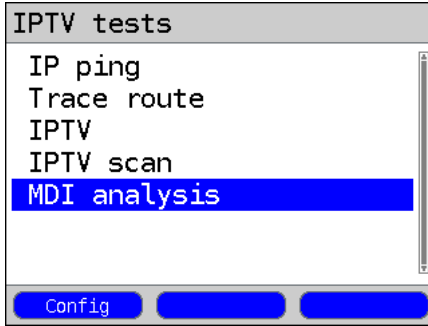
Use the cursor to select and activate the IPTV service.



The IPTV service and Router mode are active and the ADSL connection is synchronous.



Continuation on next page



<Config.> Display the MDI settings, see page 93.



Initialization

Waiting for data stream

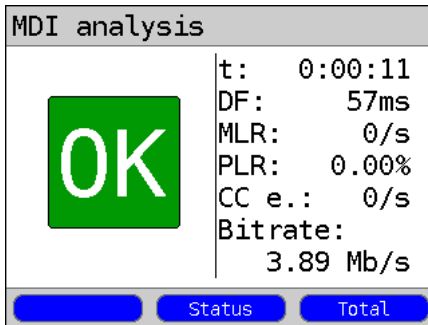
The waiting time for a data stream is dependent on the mode selected.



Stop waiting,
cancel MDI analysis

During the MDI analysis, the display shows:

- Evaluation (display OK or FAIL) depends on the MDI thresholds set.
- Test duration in h:min:s
- Delay Factor (DF) in ms
- Media Loss Rate (MLR) (number of data packets lost or out of order per second).
- Packet Loss Ratio (PLR) in percent
- The number of continuity counter (CC) errors per second that occurred in the MPEG packets.
- Display the current bitrate per second

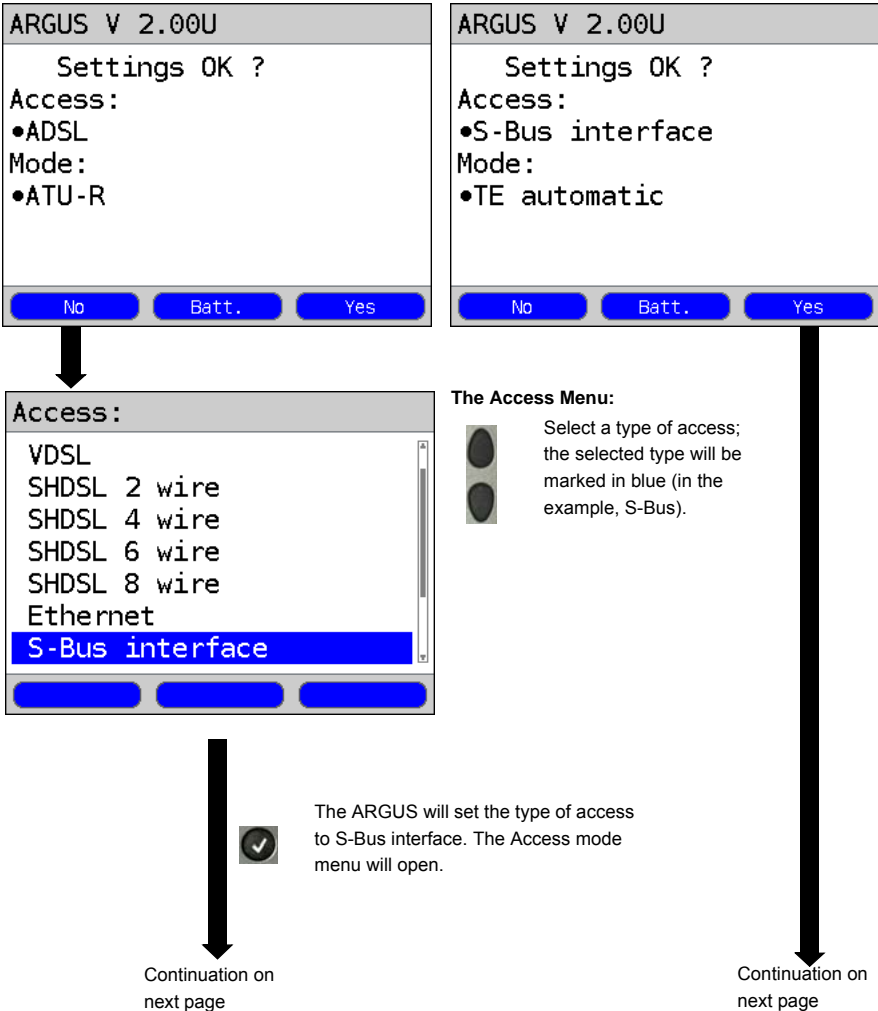


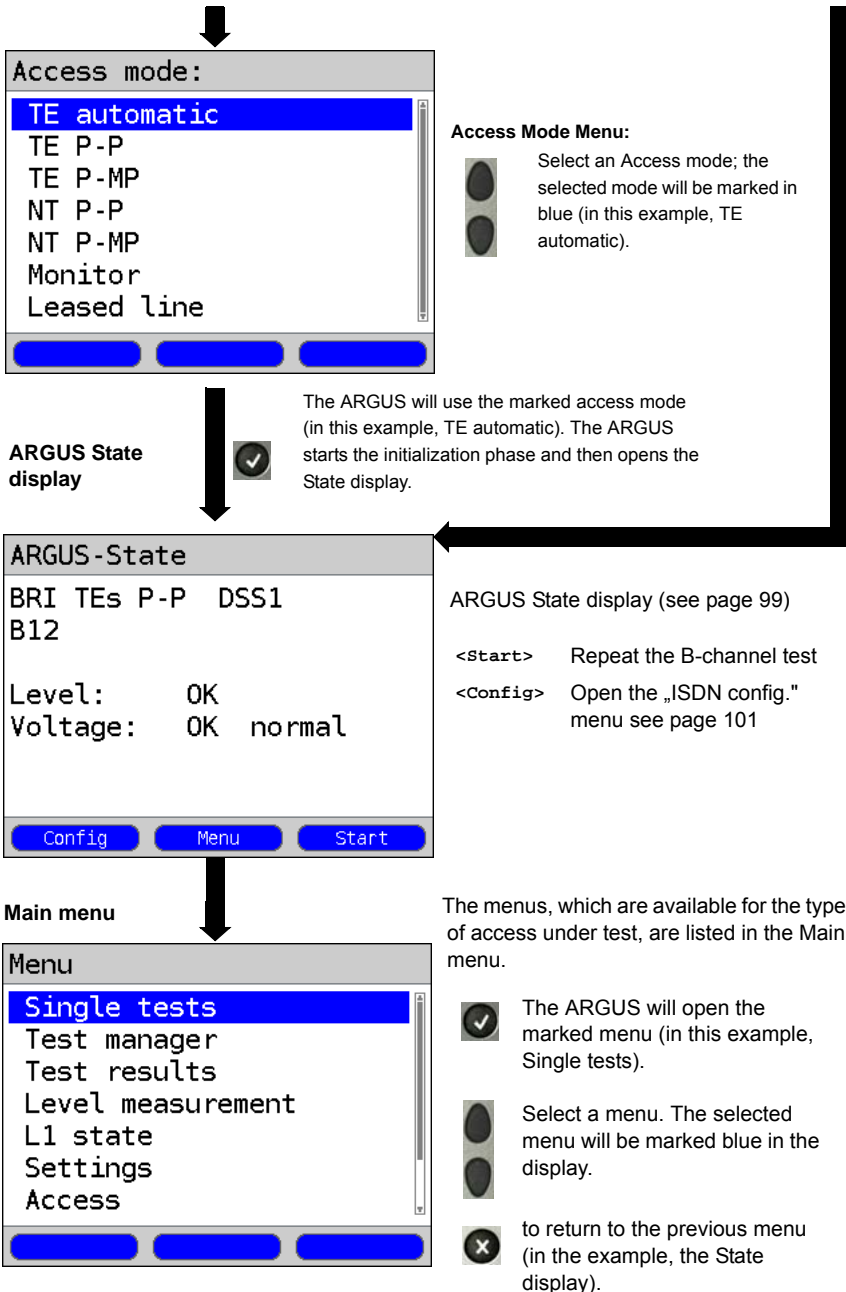
Display all MDI
analysis results

17 Operation on an ISDN Access

17.1 Setting the ISDN Interface and Access Mode

Use the included connection cable to connect either the ARGUS "BRI/PRI/E1" jack to the S access to be tested or the ARGUS "Line" jack to the U-Interface to be tested and then switch the ARGUS on. Which initial display is now shown will depend on which access setting was made last on this ARGUS (in the examples, ADSL and S-Bus accesses):





TE Simulation

In the Access mode menu (see page 96), select the desired simulation mode:

- **TE automatic**

On a BRI or U-interface access, the ARGUS will automatically determined the D-channel Layer 2 mode (PP or P-MP). If the ARGUS determines that the access supports both modes, a configuration menu will open in which you can select the desired Layer 2 mode.

- **TE P-P (point-to-point) or TE P-MP (point-to-multipoint)**

Afterwards, the access and the protocol stack will be initialized in accordance with the selected setting.

NT Simulation of a S-Bus Interface

In the Access mode menu (see page 96), select the desired simulation mode:

- **NT P-P (point-to-point) or NT P-MP (point-to-multipoint)**

Afterwards, the access and the protocol stack will be initialized in accordance with the selected setting.

17.2 Initialization phase followed by a B-channel test

Initialization of a BRI S/T or a BRI U-Interface access

The ARGUS will begin the initialization after taking over the existing, confirmed settings or new settings for the type of access and mode:

The ARGUS will first setup Layer 1. While Layer 1 is being setup, the "Sync/L1" LED over the display will flash. If the ARGUS cannot setup Layer 1, it will display the message "No Net". When the ARGUS is operated on a U-interface access, it can take up to 2.5 minutes to activate Layer 1. As soon as Layer 1 is successfully setup, the "Sync/L1" LED will light continuously.

Once Layer 2 has been setup, the "Rx/Tx/L2" LED will light.



If both modes (P-P / P-MP) are found when Layer 2 on the D-channel is checked, the mode must be selected manually (see page 98).

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. On a bilingual access, the ARGUS will use the DSS1 protocol.

The "IP/L3" LED will light after the ARGUS has setup 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 (see appendix). The ARGUS will then idle in the State display.

Example:

State display on a BRI S/T access

ARGUS-State	
BRI TEs P-P DSS1	
B12	
Level:	OK
Voltage:	OK normal
<div> <div>Config</div> <div>Menu</div> <div>Start</div> </div>	

Display:

- Type of access (in the example, BRI)

- Access mode

NTs NT Simulation Slave Mode L1
NTm NT Simulation Master Mode L1
TEs TE Simulation Slave Mode L1
TEm TE Simulation Master Mode L1

- Bus configuration

D-channel Layer 2 mode
P-P Point-to-Point
P-MP Point-to-Multipoint

- D-channel protocol

in the example, DSS1

- The availability of the B-channels

B12 Both B-channels are available
B1- Only B-channel 1 is available
B-2 Only B-channel 2 is available
B-- No B-channel is available



If only one B-channel is available, this can have an impact on the service check and the testing of the supplementary services.

- Level and voltage evaluation

OK normal	Level/Voltage is OK
<<	Level/Voltage is too low
>>	Level/Voltage is too high
--	No level/voltage
OK Rev	Emergency supply

<Start> Repeat the B-channel test.

<Config> Open the ISDN Settings menu, see page 101

It must be mentioned again, that the ARGUS only determines the general bus state once when switched on or when the ARGUS first connected. On the other hand, the state of the protocol stacks for Layers 1, 2 and 3 will be continually monitored and displayed.

- State display on a U-interface access

ARGUS-State		
U	TEs	Auto
2B1Q		
No net detected		
Voltage:		0.0V
<div>Config Menu Start</div>		

Display:

- Type of access
- Access mode
- L2 Protocol
- U-interface variant (line coding)
- Voltage when idle

17.3 ISDN settings

It is possible to configure the following "ISDN Parameters" as needed. The procedure for configuring a parameter will be illustrated with a single example: The default settings can be restored at any time.

Settings

ARGUS Main menu



ISDN



Protocol

Use the cursor keys to select, e.g. Protocol.



● **Automatic**



The ARGUS uses the marked setting as the default and returns to the next higher menu.



Mark the desired protocol. The selected protocol will be marked in blue (in this example, Automatic). The default protocol will be marked in the display by a ●. The ARGUS will use the default protocol for the ISDN connection.

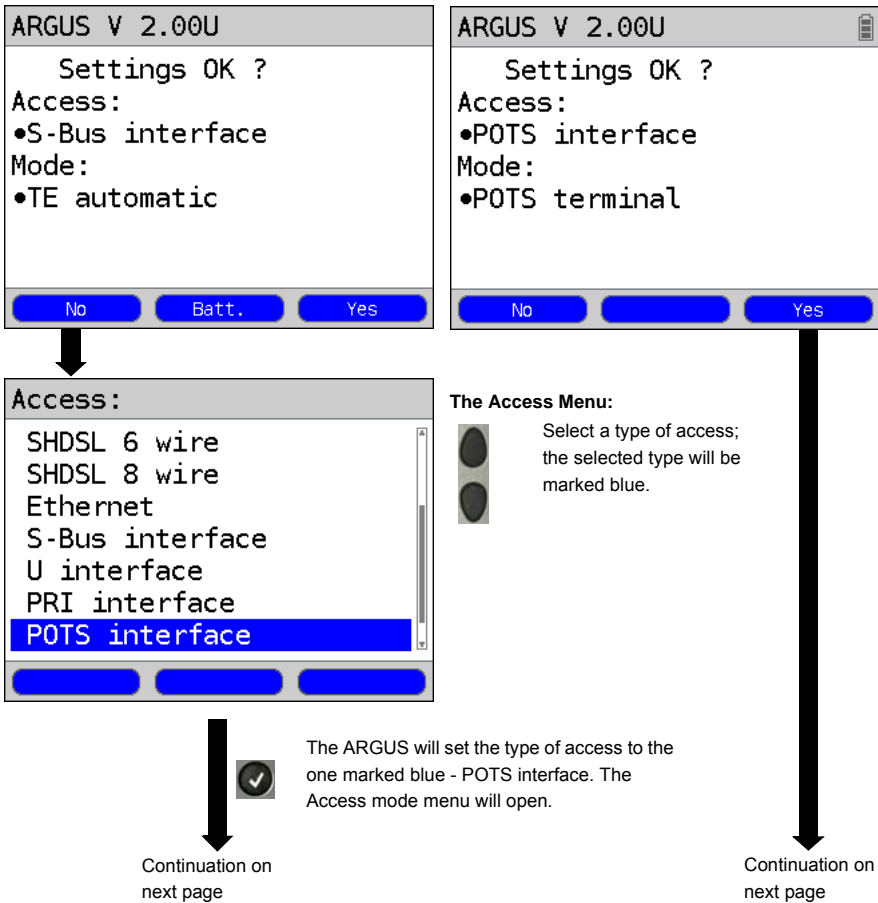


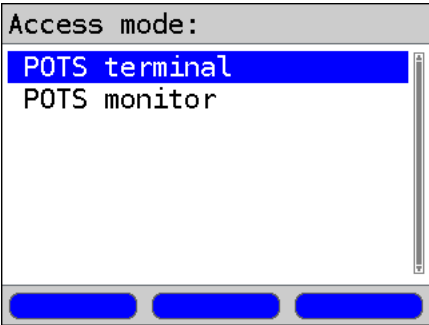
Open the next higher menu without making any changes. The ARGUS will continue to use the default setting.

18 Operation on a POTS Access

18.1 POTS Interface Settings

Use the included connection cable to connect the ARGUS (Line jack) to the POTS access to be tested and then switch the ARGUS on. Which initial display is now shown will depend on which access setting was made last on this ARGUS (in this example, S-Bus and POTS interface):





Access Mode Menu:

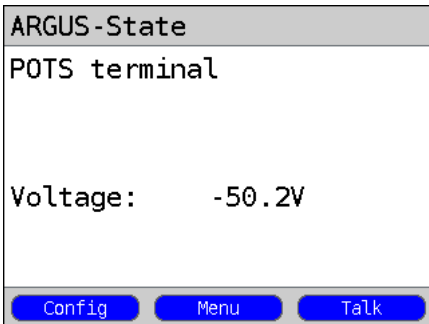


Select an Access mode; the selected mode will be marked blue (in this example, POTS terminal).

**ARGUS
State display**



The ARGUS will use the marked access mode.
The State display will open.



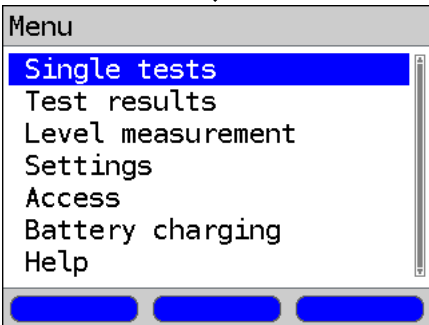
The ARGUS displays the voltage on the line when it is "on hook" (not busy).
Positive voltage: when the polarity is a+ and b- (red wire is a, black wire is b)
Negative voltage: when the polarity is a- and b+

<Config> Opens the Settings menu for POTS parameters

<Menu> Open the Main menu

<Talk> For information on setting up a call.

Main menu



The various menus available for the selected type of access will be shown in the Main menu.



The ARGUS will open the marked menu (in this example, Single tests).



Select a menu. The selected menu will be marked blue in the display.



to return to the previous menu (in the example, the State display).

19 PESQ

To provide objective evaluation of speech quality, the ARGUS support a PESQ analysis pursuant to ITU-T P.862 (Perceptual Evaluation of Speech Quality) directly on an ISDN, a POTS, an xDSL interface or an Ethernet network. The PESQ test is only available for the interface that was enabled earlier (e.g. ISDN option).

The ARGUS does not perform the PESQ analysis itself, rather it is handled by a PESQ server. This server has its own call number. The ARGUS is connected to the - to be tested - subscriber line directly and sends or loops a standardized recorded voice sample to the server.

To assess the speech quality sending, the ARGUS will send the recorded voice sample to the server, which will determine the PESQ value and send this result back to the ARGUS. The ARGUS will then display this PESQ result.

To assess the speech quality sending and receiving, the voice sample will first be sent from the server to the ARGUS which will then loop it back to the server.

19.1 PESQ settings

Settings

↓

PESQ

↓

PESQ setting

Mode

Call number POTS

Call number ISDN

VoIP destination

Use the cursor keys to select the parameter (in this example, Mode).

Use the cursor keys to select ARGUS loop for example.

The ARGUS will now use the marked setting.

The ARGUS opens the next higher menu without making any changes to the parameters.

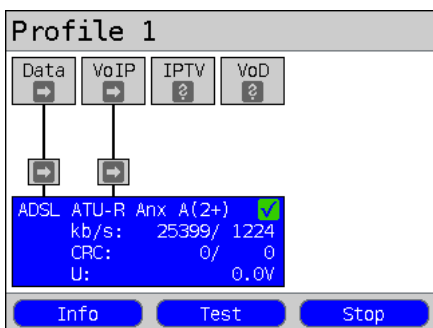
↓

ARGUS Loop

19.2 PESQ Test on an xDSL or Ethernet Access via VoIP

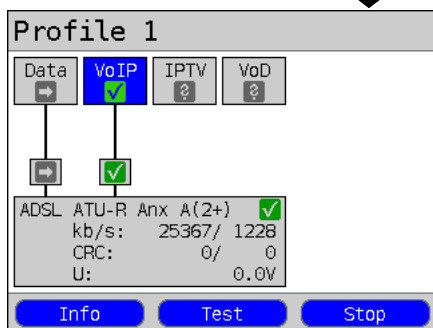
To perform a PESQ test on an xDSL or Ethernet access, first start VoIP telephony. For information on the setting of the VoIP parameters, see page 77 in the chapter on VoIP tests.

Start VoIP telephony (In this example on an ADSL access)

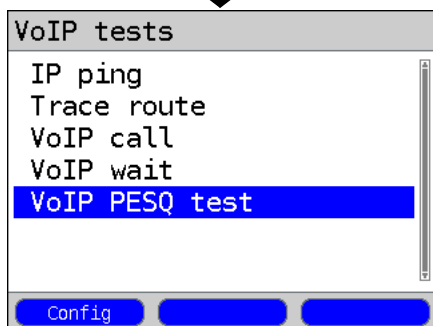


Setup the service

<Edit> The ARGUS will open the settings of the profile used to setup the connection (in this example, Profile 1).



If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 25).

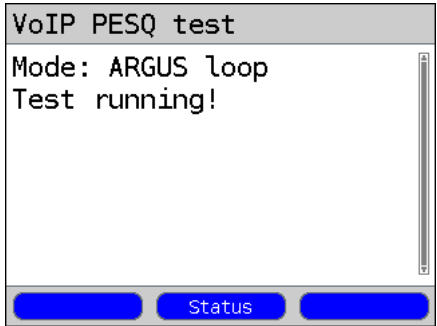


<Config.> Display the PESQ settings.

Continuation on next
page

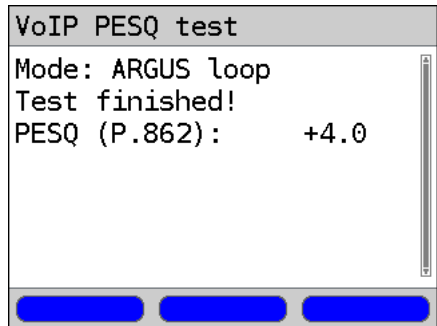


**Synchronisation
with the PESQ server**



The ARGUS will dial the call number entered under "VoIP destination" in the PESQ parameters.
In this case, the ARGUS will not dial the destination call numbers saved in the VoIP profile.

Test results:



The ARGUS will display the configured mode (in this example, ARGUS loop) and the PESQ value determine in accordance with ITU-T P.862.

The PESQ quality scale ranges from +4.5 (excellent) down to -0.5 (bad).
The evaluation of this value can be performed like for an MOS value.

20 Copper Tests

In the Access menu, you will find an entry for "Copper tests". These tests are used to examine the physical properties of the line tested.

The use of the various functions is described briefly below. Since the results are generally only presented in graphic form and as correct interpretation of the results also requires certain knowledge of the line measured, detailed instructions on the interpretation of the results would spring the bounds of this manual.

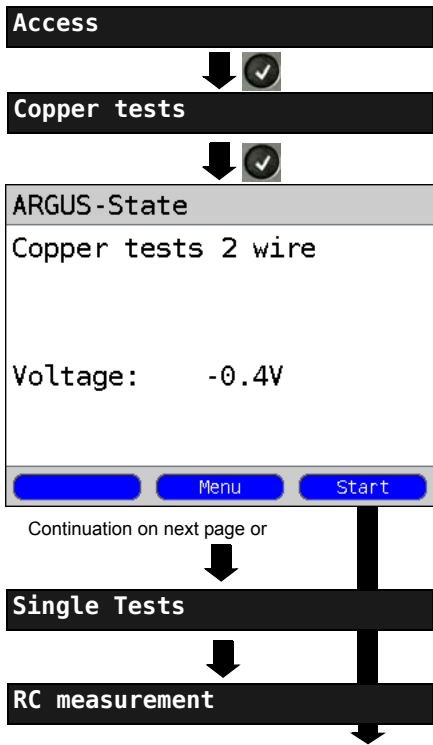
To facilitate interpretation of the results, the ARGUS supports various aids, such as e.g. the Zoom and Cursor functions.

20.1 RC Measurements

The ARGUS measures the line's resistance (loop) and capacitance (open). The ARGUS is first connected directly from the "Line" jack to the test points. Switch the ARGUS on.



The line must be voltage-free (out of service) for the RC measurement!



The ARGUS - Main menu

Select Copper tests.

ARGUS-State display

Any DC voltage on the line will be displayed here.

- Maximum measurement range: 200 V
- Resolution: 0.1 V
- Precision: $\pm 2\%$

Before beginning an RC measurement, any voltage on the line must be removed.

<Menu> Open the Main menu.

<Start> Open the Single tests menu directly or start the RC measurement (depending on the ARGUS options).

Select one of the Copper tests:

- RC measurement
- Line scope
- DMT analysis
- TDR

The selected Copper test will start as soon as it is selected.

In this example - RC measurement.

Line loop:

RC measurement	
R:	199 Ω
C:	not available
160 Ω/km	▶ 621 m
<div> Ω/km + Ω/km - New </div>	

Repeat the test.

Open line:

RC measurement	
R:	> 100 k Ω
C:	213.0 nF
49 pF/m	▶ 4.35 km
<div> pF/m + pF/m - New </div>	

Repeat the test.

The ARGUS will first determine the resistance. If the resistance test shows that the line is open (infinite resistance), the ARGUS will determine the capacitance.

The ARGUS displays the resistance. The capacitance will not be displayed, since in this example it is a loop. In addition, the ARGUS will determine the approximate length of the line e. g. to the next short-circuit based on the resistance of the line (in this example 621 m at a line resistance of 160 Ω/km).

< Ω/km +> increase the line-specific resistance (max. value 300 Ω/km)

< Ω/km -> decrease the line-specific resistance (min. value 20 Ω/km) increment 20 Ω

<New> Repeat the test.



Return to the State display

Resistance measurement: 20 Ω to 100 k Ω
 Precision: 20 Ω = R = 100 Ω : ± 10 %
 R > 100 Ω : ± 2 %

The ARGUS displays the capacitance. The resistance is out of the range of the ARGUS (> 100 k Ω).

<pF/m +> increase the line-specific capacitance (max. value of 99 pF/m).

<pF/m -> decrease the line-specific capacitance (min. value 35 pF/m), increment 2 pF

<New> To repeat the measurement



Return to the State display

Capacitance measurement: 1 nF to 1 μF
 Precision: ± 5 %

20.2 Line scope

In the Line scope test, the ARGUS performs an analysis of the connected line in real-time. The high-impedance Line scope can be switched on an existing connection between the modem and DSLAM. The results can be shown with the x-axis displaying the time domain or frequency domain (FFT).



The voltages on the subscriber line may not exceed 200VDC or 100 VAC_{pp}.

20.2.1 Start Line scope

Access

↓

Copper tests

↓

ARGUS-State

Copper tests 2 wire

Voltage: -0.4V

Menu

Start

↓

Single tests

RC measurement


Line scope

DMT analysis

TDR

Continuation on next page

↓



The ARGUS in its Main menu

Select Copper tests.

ARGUS-State display
Any DC voltage on the line will be displayed.

<Menu> Open the Main menu.

<Start> Open the Single tests menu directly

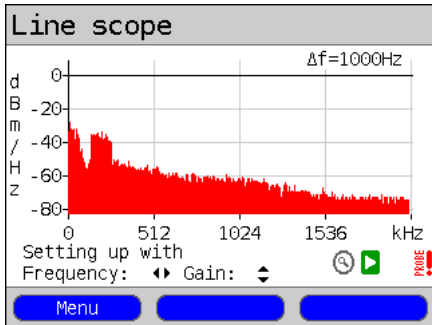
Select one of the Copper tests:

- RC measurement
- Line scope
- DMT analysis
- TDR

The selected Copper test will start as soon as it is selected.

In this example - Line scope.

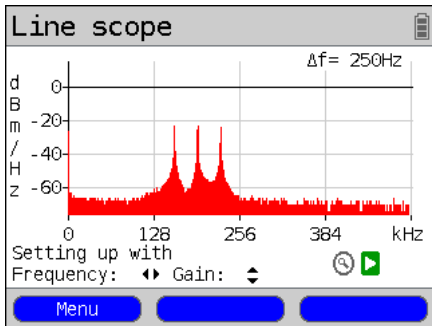
Line scope ARGUS-State display



A variety of different conditions or events on the line can be examined with the Line scope. In this example, an ADSL (Annex B) connection has been set up between a modem and DSLAM with an ISDN U-interface.

The Line scope is close to the modem, since the upstream spectrum is particularly prominent.

If the upstream was substantially lower than the downstream, this would indicate that the ARGUS was near the DSLAM.



Besides determining the general condition of the line or connection, it is also possible to use the Line scope to detect various events.

As an example, it can be used to see the handshake tone that will be sent periodically by any modem which is connected to the line when attempting to establish a connection with the DSLAM. In this way, it is possible to determine whether an active modem is connected at the other end of the line.

Furthermore, the Line scope can not only be used to examine the DSL spectrum or handshake tones, it can also be used to detect objectionable, temporary interference (in real-time operation) or noise peaks rising out of the background noise.

Connection example:



20.3 DMT analysis

Using DMT analysis (Discrete Multitone Transmission), the ARGUS can examine the spectral density (PSD - Power Spectral Density) of individual tones on a line.



The voltages on the subscriber line may not exceed 200VDC or 100 VAC_{pp}.

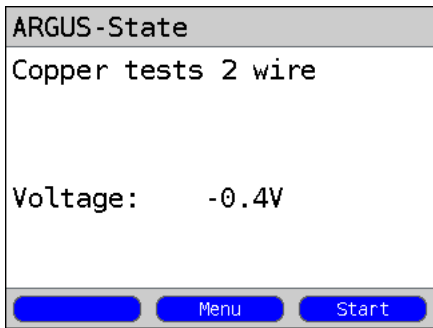
20.3.1 Start DMT analysis



The ARGUS in its Main menu



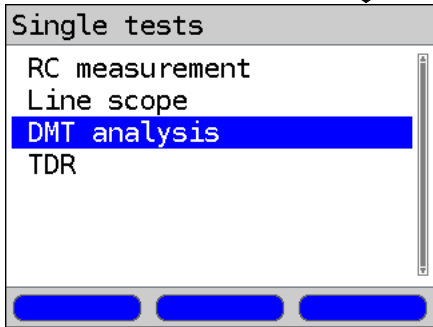
Select Copper tests.



ARGUS-State display
Any DC voltage on the line will be displayed.

<Menu> Open the Main menu.

<start> Open the Single tests menu directly



Select one of the Copper tests:
- RC measurement
- Line scope
- DMT analysis
- TDR

The selected Copper test will start as soon as it is selected.

As an example - DMT analysis

Continuation on
next page



Modes of operation in the DMT analysis:

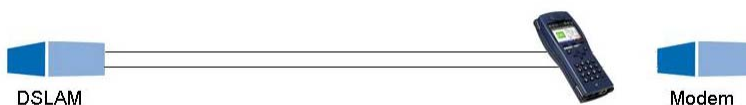
The DMT analysis can be operated in two different modes:

- | | | |
|-------------------|---|--|
| 1. Low impedance | Input impedance: 100 Ω | |
| 2. High impedance | with the ARGUS Active Probe I:
Input impedance: 12.4 k Ω
Input capacitance: 5 pF | with the ARGUS Active Probe II:
Input impedance: 70 k Ω
Input capacitance: < 1 pF |

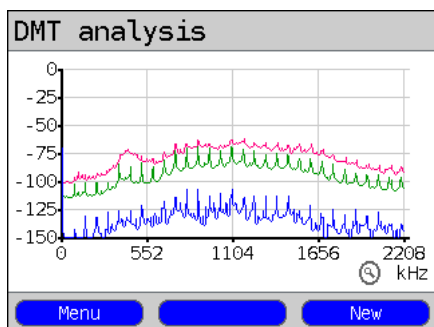
1. Low impedance operation:

In this mode, the ARGUS is connected at one end of the line as a terminal. For this mode, the line must be separated on at least one end. See following example.

Low impedance example:



In this mode, it is possible to, for example, determine the noise on a quiet line or whether there is permanent interference on the line. In this manner, it is possible to determine which line in a cable bundle has the lowest quiet line noise.



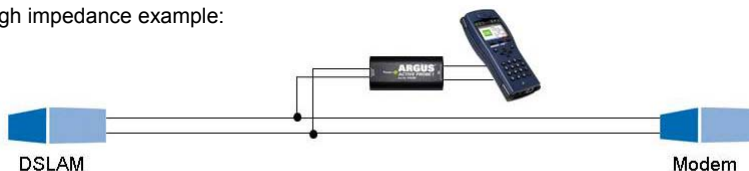
In the case of permanent interference (see the display in the example), one might find that the source is RF from a defective plug-in power supply coupled to the idle line.

It is also possible to detect the effect of crosstalk from a neighboring line on the idle line.

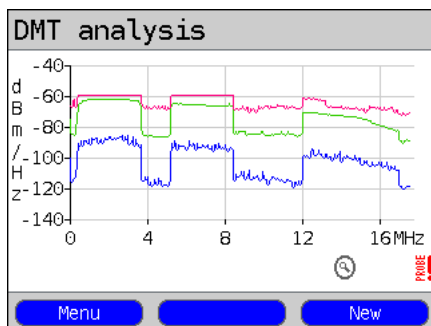
2. High impedance operation:

In this mode, the ARGUS will passively monitor an existing connection (e.g. between a modem and DSLAM) with the aid of a high-impedance ARGUS Active Probe. The line need not be separated (see the following example).

High impedance example:



In this mode, it is possible to actively monitor signals (e.g. from the modem or DSLAM) on an existing connection. In this manner, it is possible to track down the source of broadband interference that overpowers the active signals.



As an example (see the example display), it is possible in this manner to recognize the various upstream and downstream bands of an existing VDSL2 connection. Depending on where the DMT analysis is performed on the line, the level of either the upstream or the downstream will be greater.

20.4 The Active Probe

The ARGUS Active Probes are active high-impedance probes with which it is possible to passively monitor an existing connection without noticeably disturbing it.



Nonetheless, in spite of the probe's high impedance, it is possible that there may be short interruption in the existing communications connection when the probe is first connected.

The ARGUS Active Probes I + II are intended for use with the ARGUS Line scope and DMT analysis functions. The high-impedance Line scope (input impedance $3.6\text{ k}\Omega$) and the low impedance DMT analysis (input impedance $100\text{ }\Omega$) can also be used without the use of one of the ARGUS Active Probes.

20.4.1 Active Probe I

The specifications of the ARGUS Active Probe I are as follows:

- Input impedance: $12.4\text{ k}\Omega$
- Input capacitance: 5 pF
- Frequency range: 20 kHz to 30 MHz
- $2 \times 4\text{ mm}$ shrouded banana plug cable
- Data transferred to ARGUS via an RJ45 cable (pins 4/5)
- Supply voltage: 5 V via ARGUS USB host interface and USB cable

20.4.2 Active Probe II

The specifications of the ARGUS Active Probe II are as follows:

- Input impedance: $70\text{ k}\Omega \parallel$, Range:
- Input capacitance: $< 1\text{ pF}$
- Frequency range: 10 kHz to 30 MHz ($\pm 1.5\text{ dB}$)
- Attenuation symmetrical: 14.5 dB
- $2 \times 4\text{ mm}$ banana jacks (separation 12 mm)
- Data transferred to ARGUS via an RJ45 to RJ45 patch cable (pins 4/5)
- Supply voltage: 5 V via ARGUS USB host interface and USB cable

The Active Probe II can be operated in "symmetrical" or "asymmetrical" mode. Using the



hotkey it is possible switch between these modes in the menu.

Picture of the ARGUS Active Probe I:



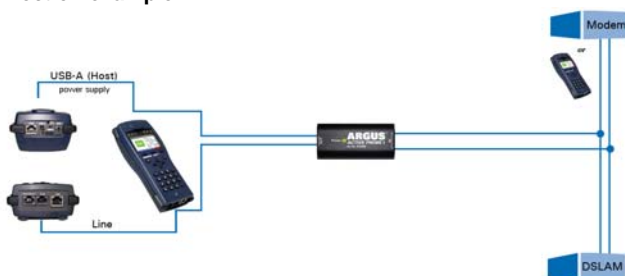
Picture of the ARGUS Active Probe II:



20.4.3 Connect the Active Probe

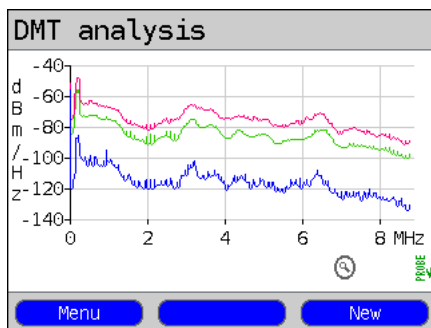
The Active Probe is connected to the ARGUS's "Line" jack and its USB-A (Host) interface. The USB Host interface of the ARGUS is used to supply the Active Probe with 5V. The Active Probe is then connected to access under test (this example shows an Active Probe I connected on the line between the modem and DSLAM). The connection should be made using leads as short as possible (< 5 cm).


Connection example:



The connection cable with the two banana plugs to the Active Probe I has been intentionally kept short. The leads used with an Active Probe II should also be kept as short as possible. In order to attain the best measurement results, it is important that the Active Probe be as close as possible to the line to be measured. Any extension of these cables will increase the input capacitance of the Active Probe and may thus corrupt the measurement results. Even the position of the two cables next to each other may - the greater the distance that they run in parallel to each other - falsify the results. If the Active Probe is used as delivered, the ARGUS will automatically include the resulting additional attenuation when calculating the measurement results.

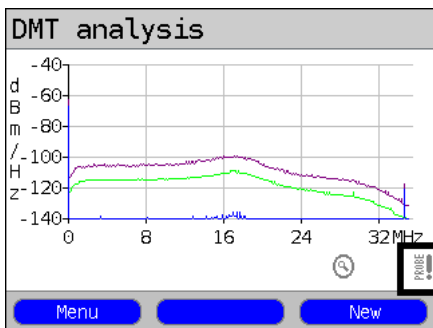
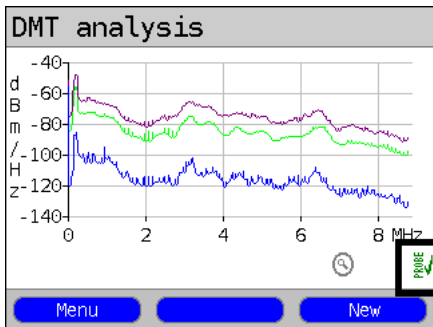
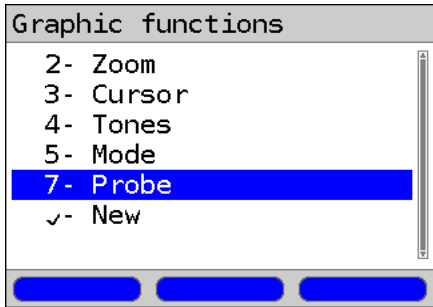
20.4.4 Start the Active Probe



After a test has been started (in this example, DMT analysis), the Probe menu can be opened from the Graphic functions or the  key.

In the case of the DMT analysis, an Active Probe's settings can even be made before starting a test.

Continuation on
next page



Open the Probe menu directly.

If the Probe is to be used, select the setting "yes".

The ARGUS will then switch the supply power onto the USB A interface and will automatically include the attenuation caused by the insertion of the Active Probe when calculating the measurement results.


If the Active Probe is activated and if it is properly powered by the ARGUS, the green LED will light on the probe.


If the Active Probe is correctly connected, a green checkmark will appear in the lower right of the display.


If the Active Probe has not been correctly connected and is not recognized by the ARGUS or if it has been deactivated in the Probe menu, an exclamation mark will appear at the lower right of the display instead.

20.5 TDR

Using the TDR function, it is possible to determine the line length and locate sources of interference. Correct interpretation of the pulses displayed by the ARGUS will allow detection of among others stub lines, bad contacts or short-circuits. In performing a TDR, the ARGUS sends a pulse down the connected line and displays the returning reflected pulse.

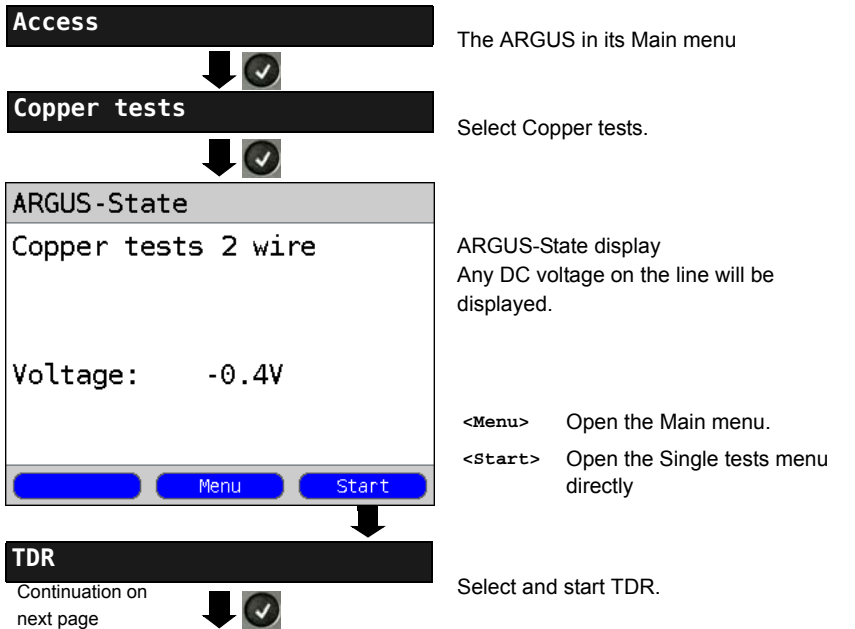
- 

Any DC voltage on the access line may not exceed 200 VDC. Furthermore, the line must be free of any AC voltages.
- 

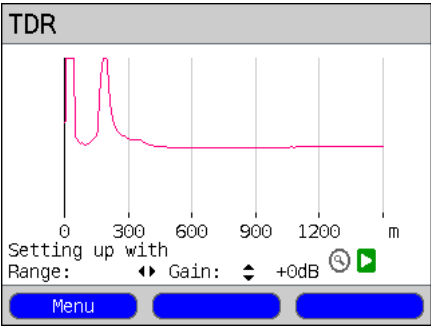
The result displayed of a TDR measurement may create the impression that there are multiple disturbances on the line. It is advisable to clear the first disturbance or fault and then run the test again. It is possible that the first disturbance or fault caused one or more reflections and thus created the false impression that the line has multiple faults. In many cases there is only one fault on the line.
- 

The ARGUS will generate a reflection at about 3 meters. To measure short lines precisely and to avoid this reflection, we recommend the use of longer a connecting cable e.g. one 5 m long. The pulse will still appear in the graph but by using the longer connecting cable you can be sure that it is not from the line under test.

20.5.1 Start TDR



TDR state display:



The ARGUS will directly show the possible locations of faults on the 2-wire copper line.
In this example, one sees that after the input pulse (starting at 0 meters) a second pulse rises at about 150 meters. This could indicate that the line is open at the end of 150 meters.

Analysis in greater detail is possible by adjusting the range and gain and by using the Graphic functions.

The graphic functions such as Zoom and Cursor serve to allow detailed analysis of the graphs.

21 Using the Battery Pack

Changing the battery pack

Switch the ARGUS off and disconnect the plug-in power supply. Afterwards, loosen the thumbscrew to release the battery pack.

Battery pack handling



The ARGUS may only be operated with the included battery pack. Connecting any other voltage supply to the contacts in the device will damage the ARGUS.

- The supplied battery pack may only be charged in the ARGUS.
- Do not use the supplied battery pack in other devices.
- The ARGUS battery pack may only be actively charged (Charge accus) or trickle charged (default setting: off) when the ambient temperature is between 0 °C (+32 °F) and +40 °C (+104 °F) .
- Recharge the battery pack fully at least once a month (even if the ARGUS is not used for a longer period of time).
- If the lithium-ion battery pack is stored, it should first be charged to between 40 and 60 % of its capacity. If the lithium-ion battery pack is stored for a longer period of time, it should be recharged to this level every six months.
To maximize a battery pack service life, if it is to be stored over a longer period of time, it should not be exposed to temperatures in excess of +50 °C (122 °F).
- Please read the extensive notes on safety and the transport of the lithium-ion battery pack found in the section "Safety Instructions" (see page 5).

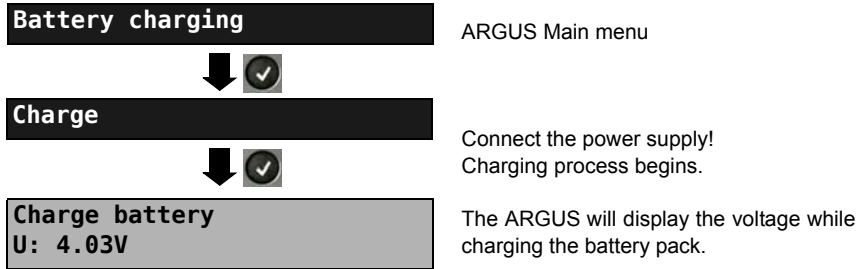
Automatic recharging of the battery pack when the ARGUS is switched off

The ARGUS automatically recharges the battery pack, if the ARGUS is connected to the plug-in power supply and is switched off and the battery pack voltage is too low. While charging, the ARGUS displays the message "Charge". If you press and hold the power switch, the ARGUS will switch off before battery is recharged. The ARGUS remains on after fully recharging the battery pack.

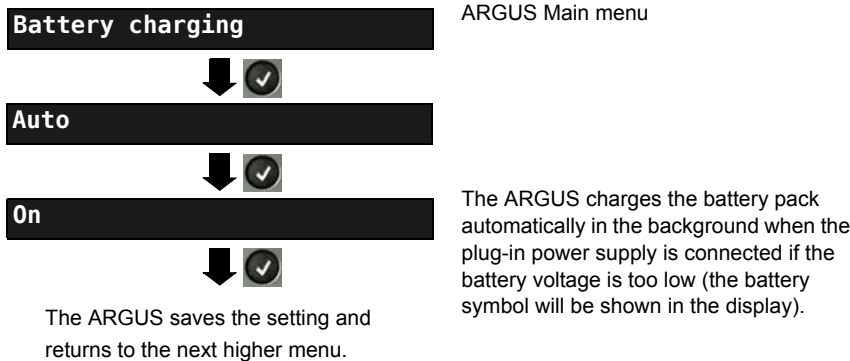
Battery charging

The ARGUS will display the current charge of the battery pack graphically, if no power supply is connected. A battery symbol on the display will begin to flash, when there is still approximately (depending on the mode of operation) 5 minutes reserve. During this period, it is possible that there may be audible interference and in rare cases even malfunctions. Connect the power supply.

When the plug-in power supply is connected, the battery pack in the ARGUS can be fully recharged. It is not necessary to manually discharge the lithium-ion accumulators in the ARGUS battery pack. It may take up to 6 hours to fully recharge the battery pack.



Automatic recharging of the battery pack in the background (Auto charge)



If the ARGUS is disconnected from the power supply before the battery pack is fully recharged, the ARGUS will not automatically begin to charge the battery pack again when it is reconnected to the power supply, since the battery voltage is no longer less than the threshold value.

22 Firmware Update

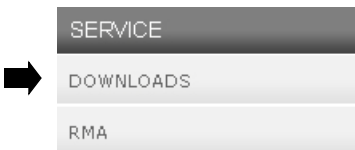
You can download a firmware file from www.argus.info/en/service free-of-charge and save it on your PC to later transfer to your ARGUS tester.

Open the Internet site www.argus.info/en:

Click on "Service" (shown here in blue) in the navigation bar.



In the "Service" drop-down list that now appears, click on "Downloads".



This will open the product list:

SERVICE	DOWNLOADS																				
DOWNLOADS	<p>Download area</p> <p>Download user manuals, an overview of menu and test leads, data sheets, brochures, PC software and our free firmware updates.</p> <p>Choose your Tester:</p> <table> <tr><td>ARGUS 145 plus</td><td>ARGUS 145</td></tr> <tr><td>ARGUS 142</td><td>ARGUS 42</td></tr> <tr><td>ARGUS 141</td><td>ARGUS 44</td></tr> <tr><td>ARGUS 42 plus</td><td>ARGUS 43</td></tr> <tr><td>ARGUS 41 plus</td><td>ARGUS 28</td></tr> <tr><td>ARGUS 126</td><td>ARGUS 26</td></tr> <tr><td>ARGUS 125</td><td>ARGUS 25</td></tr> <tr><td>ARGUS 3u NT</td><td>ARGUS 10</td></tr> <tr><td>ARGUS 3u plus</td><td>ARGUS 3u basic</td></tr> <tr><td>ARGUS 3u basic plus</td><td>ARGUS 3u</td></tr> </table> <p>WiFiplus-WiFianalyse</p> <p>ARGUS Update Tool</p>	ARGUS 145 plus	ARGUS 145	ARGUS 142	ARGUS 42	ARGUS 141	ARGUS 44	ARGUS 42 plus	ARGUS 43	ARGUS 41 plus	ARGUS 28	ARGUS 126	ARGUS 26	ARGUS 125	ARGUS 25	ARGUS 3u NT	ARGUS 10	ARGUS 3u plus	ARGUS 3u basic	ARGUS 3u basic plus	ARGUS 3u
ARGUS 145 plus	ARGUS 145																				
ARGUS 142	ARGUS 42																				
ARGUS 141	ARGUS 44																				
ARGUS 42 plus	ARGUS 43																				
ARGUS 41 plus	ARGUS 28																				
ARGUS 126	ARGUS 26																				
ARGUS 125	ARGUS 25																				
ARGUS 3u NT	ARGUS 10																				
ARGUS 3u plus	ARGUS 3u basic																				
ARGUS 3u basic plus	ARGUS 3u																				
RMA																					

Select the model of your ARGUS.

After you have selected the type of device, the page showing the relevant firmware updates will open. On this page, you can select the firmware variant for your specific country.



The screenshot shows the ARGUS 145 PLUS website. At the top, there is a navigation bar with links: HOME, PRODUCTS, SERVICE, NEWS, ABOUT US, DEALERS, CONTACT. On the right, there are dropdown menus for 'PRODUCTS' and 'INTERFACES', and a 'SEARCH' button. Below the navigation bar, there is a large image of the ARGUS 145 PLUS device. To the right of the image, the text reads: 'ARGUS® 145 PLUS Triple Play + xDSL Combitester'. Below this, it says: 'The ARGUS 145 plus Triple Play + xDSL Combi Tester verifies VDSL2, ADSL, SHDSL, Ethernet, ISDN and POTS accesses and supports copper and Triple Play tests on top.' Below the image, there is a table with two columns: 'ARGUS 145 PLUS' and 'DOWNLOADS / FIRMWARE'. The 'ARGUS 145 PLUS' column has links: OVERVIEW, TECHNICAL DETAILS, DOWNLOADS, DATASHEET, MANUAL, PC SOFTWARE, FIRMWARE, and PROFESSIONAL ARTICLE. The 'DOWNLOADS / FIRMWARE' column has a note: 'Please also download the short guide for the firmware 2.0. It contains important information on the new profile structure.' Below this note, there are three download links: 1. 'ARGUS 14x-Serie Schnelleinstieg (V 2.0 / German)' with a PDF icon and file name '00_ARGUS 14x-Serie_Schnelleinstieg_0_V_2_0.pdf (416.54 KB)'. 2. 'ARGUS 14x-Series Short guide (V 2.0 / English)' with a PDF icon and file name '00_ARGUS 14x-Series_short guide_U_V_2_0.pdf (673.56 KB)'. 3. 'ARGUS 145plus Firmware (V 2.00 / German)' with a PDF icon and file name '01_ARGUS 145plus_firmware_0_V_2_00.zip (13.16 MB)'. 4. 'ARGUS 145plus Firmware (V 2.00 / English)' with a PDF icon and file name '02_ARGUS 145plus_firmware_U_V_2_00.zip (13.15 MB)'. At the bottom left of the table, there is a 'BACK' link.

After you have selected the required variant, a browser window will open to permit you to select the location where the firmware should be saved on your PC. The remaining steps are explained in the WINanalyse manual and in the guide for the Update Tool.

Important information regarding the ARGUS Firmware Update:



Do not, under any circumstances, start to update the firmware if the ARGUS is running on its battery pack. First connect the ARGUS to the plug-in power supply, before sending the firmware update file from your PC to the ARGUS. An ARGUS USB cable is required to perform an update (USB cable with a mini-USB plug). Save the configuration and test results before beginning an upgrade. Do not disconnect the ARGUS from the PC during the update. Do not switch the ARGUS off while an update is being performed. You must also pay attention to the messages on the ARGUS display – not just the instructions displayed by the Update Tool on the PC. The update has not been successfully completed until the Update Tool displays a corresponding message on the PC and the ARGUS – after being automatically restarted by the Update Tool – shows the normal startup screen.

The ARGUS will not switch on until after you have clicked on one of the two buttons ("back to step 1" or "Exit program") on the Update Tool after the update has been completed.