ARGUS 141
Manual

Version: 2.10/ **EN**

Important Notice:
A basic ARGUS package includes at least a DSL interface (ADSL or VDSL) 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.

1 Introduction

The ADSL+VDSL and service tester

Fast testing guaranteed: the ARGUS$^®$141 xDSL Tester focuses on the key functions for testing VDSL2, ADSL and Ethernet and is ready to operate extremely quickly.
The user-friendly handheld tester is able to integrate both interfaces in a single device. Modern chip sets for ADSL and VDSL2 ensure optimum performance, thus providing a high level of interoperability and a long reach. The results are presented both in tabular or graphical form.

Future-proof testing

Well equipped for the future: as an option, the ARGUS$^®$141 can be upgraded to test Voice over IP (VoIP) and data services such as ping, trace route or download (HTTP, FTP) and upload (FTP) via xDSL and Ethernet – this upgrade is even available after purchase.

Testing of services: Voice over IP (VoIP)

During VoIP testing, the MOS value is also calculated automatically. As a lineman's handset, the ARGUS$^®$141 simulates terminal equipment such as a phone or replaces a PC and determines the relevant quality parameters.
intec also supply the checker with bridge or router functions to test customer modems.

Spectrum analysis

Using the DMT Analysis functionality, the user can analyse – in a low-impedance mode – the spectrum of the entire xDSL bandwidth (up to 30 MHz) and locate faults.

Easy Operation

The ARGUS$^®$141 is extremely user-friendly thanks to its bright 320 x 240 pixel colour display and long-life Lithium-Ion battery pack, which can be replaced in the field.

Software updates can be downloaded to a PC free of charge and then loaded into the ARGUS at any time. They are available at http://www.argus.info/en/service/downloads/.

An overview of a few of the important ARGUS functions:

xDSL tests (ADSL, ADSL2 and ADSL2+, VDSL2)

- **Synchronisation with the DSLAM (xTU-C) and determination of all relevant connection parameters and error counters**

- **Bridge, Router and Terminal Modes**

Ethernet interface

- **1 Ethernet test interface (10/100 Base-T), RJ-45**

IP and ATM tests via xDSL and Ethernet

- **ATM tests (ADSL only)**

    - ATM OAM ping, ATM OAM cell loop and VPI/VCI scan

- **IP tests**

    - Ping and trace route tests (BRAS information, PPP trace and VLAN)

    - Download tests to determine throughput (HTTP download, and FTP upload and download)

    - FTP server test, upload and download from ARGUS to ARGUS

- **VoIP test**

    - VoIP terminal simulation, including acoustics (various codecs)

    - OK/FAIL evaluations and display of the quality parameter

    - Evaluation of the VoIP voice quality (QoS) in accordance with:
      - MOS_{CQE} (ITU-T P.800), E-Model (ITU-T G.107)

- **IPTV tests**

    - Stream requests (STB mode), IPTV channel scan, IPTV passive

    - OK/FAIL evaluations and display of the quality parameter

Copper Test functions (Copper Tests)

- **DMT Analysis:** Analysis of the Power Spectral Density (PSD) and the noise of up to 4096 tones (e.g. VDSL2 Profile 30a).

Access acceptance report

When the ARGUS is connected to a PC via USB, it is, as an example, possible - with the aid of the WINplus software - to create a comprehensive test report on the PC and print it.

The Concept of the ARGUS Firmware User Interface

The ARGUS firmware presents - on a graphic Status screen - the results of tests made with the latest in measurement technology. In this manner, all of the important processes can be shown on a single screen together with main sequences with all the convenience and transparence to which ARGUS users are accustomed.

In this manner - with its intuitive menu structure - the ARGUS makes it easy to not only configure, start and perform tests but also to examine the test results:

- The physical layer - Layer 1 (e.g. DSL) - can be started and stopped completely independently of the higher layers such as Virtual Lines (L2/3), services or tests.

- Layer 2 (VLAN, VPI/VCI) and Layer 3 parameters (PPP, IP) are combined in independent Virtual Line profiles (VL profiles). Multiple VL profiles can be configured and started on a single DSL access. It is also possible to bridge and route multiple Virtual Lines concurrently.

- Thanks to the introduction of services between the Virtual Lines (VLs) and the Data, VoIP and IPTV tests, it is now possible to take an incoming call even when the ARGUS is used as an IP phone with VoIP activated.

You will find other important information about profile structures on our website.

Should you have any further questions, please contact us:

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

2 Safety 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 access are not high enough to be dangerous or outside the specified range 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)
- 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.
  This is a Class A device. It may cause radio interference in a living area. In this event, the operator may be requested to take appropriate measures.
- The ARGUS battery pack may only be actively charged (Charge battery) or trickle charged (default setting: on) 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.
- Before running a test or synchronizing on an interface, determine how the ARGUS should be powered.

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.

2.1 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 throw the battery pack into a fire or heat it (> 60 °C) (140 °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 °C (32 °F) and +40 °C (104 °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 °C (95 °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. Like any battery, the battery pack has two poles (plus and minus). To prevent damage, make certain that it is correctly connected (polarity) to the ARGUS or 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 discolored 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.

3 General Technical Data

Tester specifications:

Dimensions / Weight	Inputs / Outputs
Height: 235 mm (9.25 in) Width: 97 mm (3.8 in) Depth: 65 mm (2.56 in) Weight: approx. 710 g (1.57 lbs) (including battery pack)	- RJ-45 (Line) for xDSL and Copper Tests - Ethernet 10/100 Base-T - USB-B jack, USB Client interface
Keypad 25 Keys	
LCD display LCD color display with switchable background lighting, 320 x 240 pixels	**Temperature ranges** Temperature range - charging batteries: 0 °C (+32 °F) to +40 °C (+104 °F) Operating temperature (in battery mode): -10 °C (+14 °F) to +50 °C (+122 °F) Operating temperature (with power supply/car adapter): 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 mA ARGUS electronic 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 symbol The ARGUS 141 conforms with the EU Directive 2004/108/EC as well as 2009/C197/03. We would be happy to supply you with a copy of the detailed Declaration of Conformity upon request.

Supported Standards:

ADSL (Line):	Dielectric strength:
ITU-T G.992.1, Annex A (ADSL) ITU-T G.992.2, Annex A (G.lite) ITU-T G.992.3, Annex A (ADSL2) ITU-T G.992.5, Annex A (ADSL2+) ITU-T G.992.1, Annex B (ADSL) ITU-T G.992.3, Annex B (ADSL2) ITU-T G.992.5, Annex B (ADSL2+) ITU-T G.992.3, Annex J (ADSL2) ITU-T G.992.5, Annex J (ADSL2+) ITU-T G.992.3, Annex L (RE-ADSL2 over POTS) ITU-T G.992.3, Annex L (RE-Narrow PSD ADSL2 over POTS) ITU-T G.992.3, Annex M (ADSL2) ITU-T G.992.5, Annex M (ADSL2+) ANSI T1.413 ETSI TS 101 388 Annex C	**Line:** DC voltage: +200 V max. Alternating Current (AC): 100 V_{pp} max. (Copper Tests only) DC voltage: +200 V max. (xDSL)
VDSL (Line): ITU-T G.993.2 (VDSL2) Profile: 8a, 8b, 8c, 8d, 12a, 12b, 17a, 30a	
Ethernet (LAN): IEEE 802.3 - 10 Base-T - 100 Base-T Autonegotiation Auto-MDI(X)	

4 Operating Instructions

Speaker

LEDs

LC display

Softkeys

Return key

Confirmation key

Cursor keys

Numerical keypad

Shift key

Level key

Telephony: Pickup / Hang up

Power

Microphone

Fastener for shoulder strap

Power key

- Switch the ARGUS on
- To start up again after a "power down" (adjustable see page 203)
- To switch on the display backlighting (can also be done by pressing any other key). In battery mode to save power, the backlighting will switch off automatically after an adjustable period of time - see page 204.
  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 (see page 208). If the ARGUS is connected to its power supply, it will automatically charge its accumulators when it is switched off (see page 208 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

- Scroll through the display line-by-line (vertical cursor keys)
- Move the cursor within a displayed line (horizontal cursor keys)
- When viewing a selection list or statistics, the cursor will jump to the end of the list/statistics if the right cursor key is pressed or to the beginning 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
- Select functions in the graphic Status screen

Telephony

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

- Start VoIP telephony

Level key

- xDSL access: Display the results
- Ethernet: Open the results
- Open the graphic 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), e.g. page 106 et seq.

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 menus, 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 175).

Press the Shift key: the function of the softkey will change accordingly.

Example
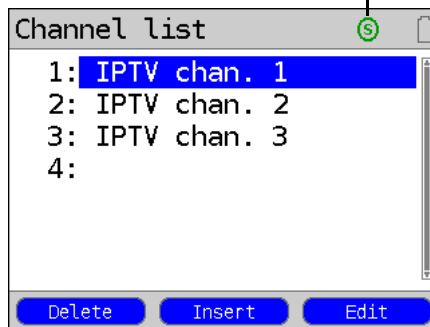
The ARGUS is in largest part operated with the 4 cursor keys, the confirmation key , the return key , the level key , and the three softkeys.
The current assignment of the three softkeys is shown in the lower line of the display.

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 , the <↓> softkey performs the same function as the cursor key on the ARGUS keypad, and so on.

Example of operation:

```
ARGUS V 2.10U                    ▯
        Settings OK ?
Access:
●ADSL
Mode:
●ATU-R


┌──────────┐┌──────────┐┌──────────┐
│    No    ││ Battery  ││   Yes    │
└──────────┘└──────────┘└──────────┘
```
——————— Current assignment of the softkeys
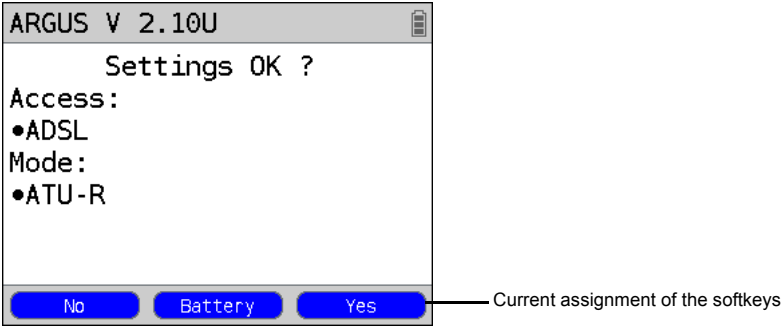
Press **<No>**: The displayed access will
not be used. The Access Menu will open.

Header: Shows the name of the menu (in this
example, the Access Menu), the name of the
currently running test etc.

```
Access:                          
┌─────────────────────────────────┐
│ ADSL                          ▲ │
│ VDSL                            │
│ Ethernet                        │
│ Copper tests                    │
│                                 │
│                               ▼ │
└─────────────────────────────────┘
┌─────────┐┌─────────┐┌─────────┐
└─────────┘└─────────┘└─────────┘
```

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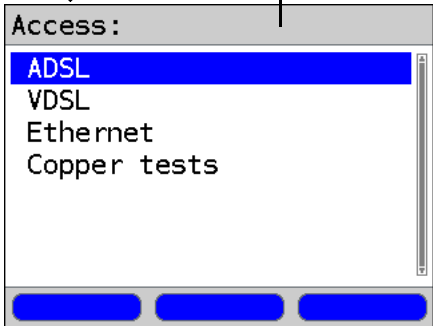the   access; the selected type will
             marked in blue
             (in this example: ADSL).

Using   Confirm the selection:
             in this example, the ARGUS will
the   set the type of access to the one
             marked in blue. The Access Menu
             will open.

```
Access mode:                     ▯
┌─────────────────────────────────┐
│ ATU-R                         ▲ │
│ ATU-R bridge                    │
│ ATU-R router                    │
│                                 │
│                                 │
│                               ▼ │
└─────────────────────────────────┘
┌─────────┐┌─────────┐┌─────────┐
└─────────┘└─────────┘└─────────┘
```
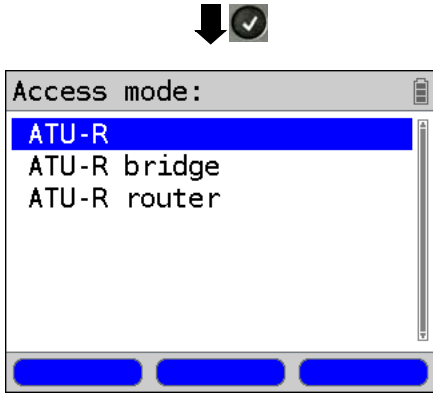
Using   Return to the previous display
             without changing to marked type of
the   access.

Continuation on
next page
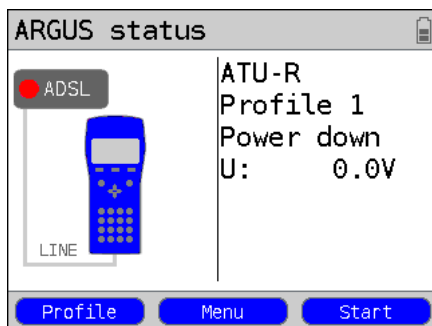
<Profile>	Displays the profile, see page 30
<Menu>	Open the Main Menu
<Start>	Start the ADSL connection
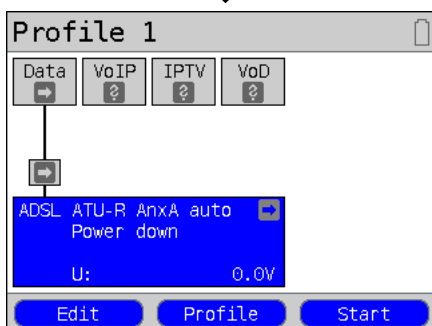
<Edit>	Open the xDSL and Ethernet settings
<Profile>	Configure profile
<Start>	Start the ADSL connection

Access up

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 208).

USB-B (mini-USB):
USB Client interface (PC connection)

Access down

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

Line

Access xDSL   Pin assignment: 4/5

Access Copper   Pin assignment: 4/5

LAN

Connection to a PC's network card
Connection to the Ethernet interface of an
xDSL modem, router (IAD) or a hub, switch or
other Ethernet interface (Access: Ethernet).

Green "Speed" LED:
signals the transmission speed
-   LED off: 10 Base-T
-   LED on: 100 Base-T

Charging the battery (accumulator) for the first time

The compartment for the rechargeable battery pack (accumulators) is located on the back of the case. Insert the battery pack with the locating lug at the top and then tighten the thumbscrew. Use only the battery pack included in the package. With the ARGUS switched off, connect it to the supplied plug-in power supply.

Press the ⏻-key to switch the ARGUS on. The following display should appear (it may be necessary to first acknowledge other displayed notices):

The access and mode shown may vary.

Current assignment of the softkeys

Press **\<Battery\>**

Menu name
Selected menu item

Press

Once the battery pack has been fully charged, the ARGUS will indicate this in the display.

Press: Cancel "Charge" battery pack
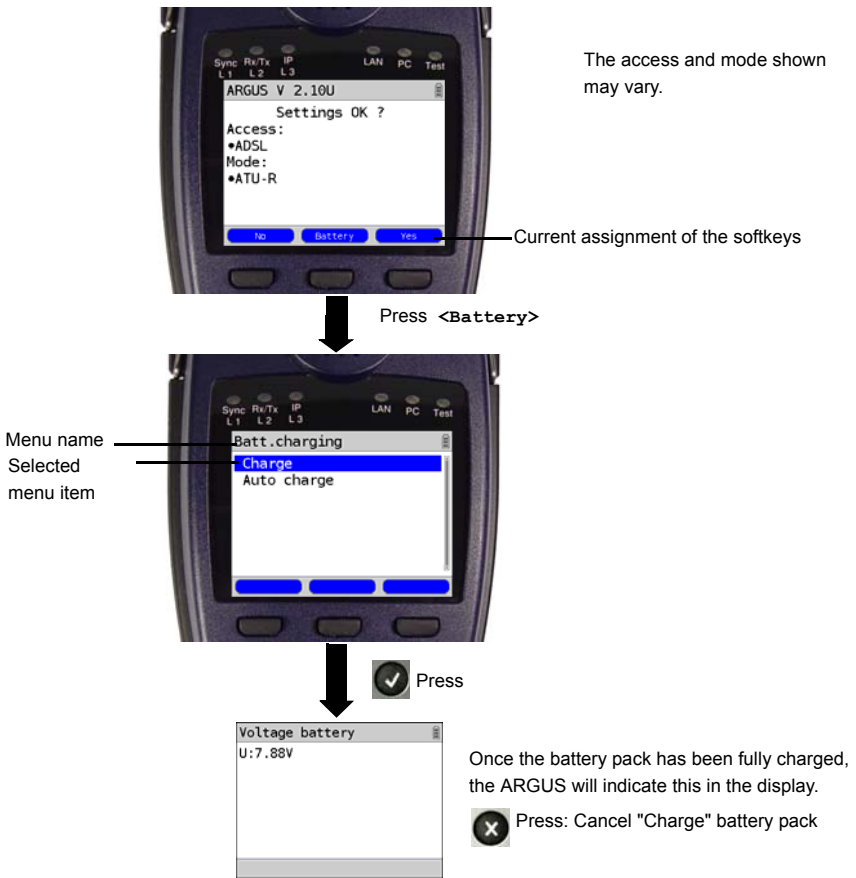
The supplied battery pack will not reach its full capacity until it has been fully charged (see page 208 Using the Battery Pack).

Power management

In battery mode, the ARGUS will automatically power down after it has been idle for 5 minutes (this setting can be changed, see page 204). Reasonably enough, the ARGUS will not power down during a test (e.g. Loopbox) or when it is in Trace mode.

As an alternative, it is possible to operate the ARGUS using the included plug-in power supply. When the power supply is connected, the accumulator is automatically disconnected. Regardless of whether the power supply is connected, the accumulator should always installed using the ARGUS. This will ensure, among other things, the uninterrupted operation of the real-time clock.

Unplug the power supply from the mains, once the ARGUS is switched off and will no longer be used (Battery charging).

An Overview of the ARGUS Connections

5 Menu Hierarchy

Switch the ARGUS ON

ARGUS V 2.10U

Settings OK ?
Access:
•ADSL
Mode:
•ATU-R

| No | Battery | Yes |

The initial display will depend on the type of access set last.
In this example: ADSL access

Menu Accu Servicing

Charging   page 209
Trickle charge   page 209

ARGUS status

ATU-R
Profile 1
Power down
U: 0.0V

●ADSL

LINE

| Profile | Menu | Start |

The main window will open displaying menus available for the type of access selected last (see page 25, "Single Tests" menu).

and

Selection of the physical access

Menu Access

ADSL   page 27
VDSL   page 60
...
and so on   page 76

The Access Menu will open automatically

e.g. ADSL

Menu Access mode	ATU-R page 35
	ATU-R Bridge page 53

VDSL

VTU-R	page 62
VTU-R Bridge	page 70

Further	page 76

Selection of the Access Mode, e.g. xDSL or Ethernet

```
ARGUS status
  ● ADSL          ATU-R
                  Profile 1
                  Power down
                  U:    0.0V
  LINE
  [ Profile ]  [ Menu ]  [ Start ]
```

Menu Single Tests

IP ping	page 120
Further	page 127

⚠️ **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.**

```
Profile 1
 [Data] [VoIP] [IPTV] [VoD]
   ➡     ?     ?     ?

 ➡
 ADSL ATU-R AnxA auto  ➡
      Power down
      U:          0.0V
 [ Edit ]  [ Profile ]  [ Start ]
```
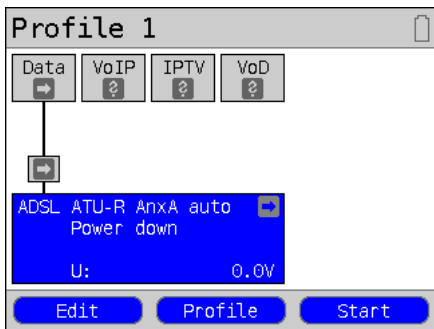
To open the ARGUS State Display, press

the Level key ⎍ .

The State Display is the one from which all other steps are taken.

6 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 82 (Virtual Lines) and page 102 (Services). The physical layer of a VDSL 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 change the ADSL access parameters directly, press **<Edit>**. To change the type of access directly from the Status screen (Figure 2), press the key combination and .

Figure 1

Figure 2 (example, ATU-R Router):

Press the Level key

Profile name

Services, see page 102

Virtual Lines, see page 82

Layer 1

Current assignment of the softkeys

Router / Bridge
(xTU-R Bridge and xTU-R Router only)

<Edit>   Edit the ADSL settings

<Profile>   Profile selection
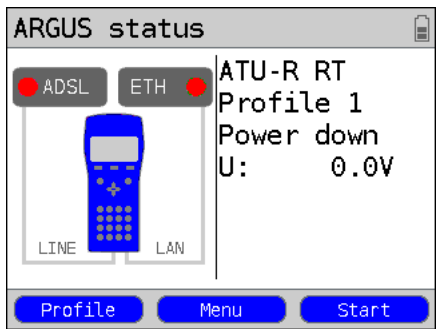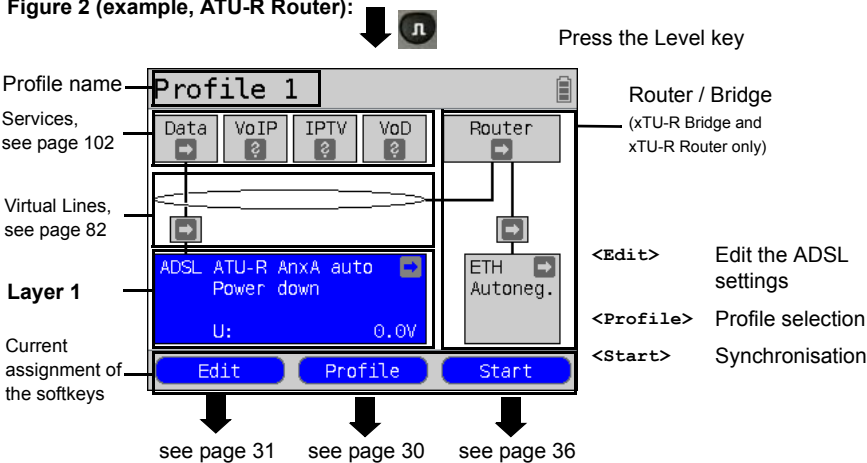
<Start>   Synchronisation

see page 31   see page 30   see page 36

For information on tests that can be performed on Layer 1, see page 104.

7 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 35. 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), see page 53. 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), see page 57. 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.

⚠️ The voltages on the subscriber line may not exceed 200 VDC and should be free of AC voltage.

7.1 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 status

ADSL

ATU-R
Profile 1
Power down
U: 0.0V

LINE

Profile   Menu   Start
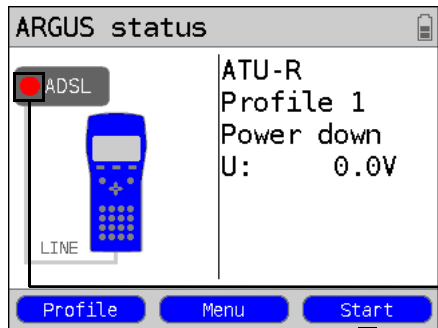
Items displayed (from top to bottom):

Access mode (in the example: ATU-R)

- Default (preset) profile (in the example: Profile 1)

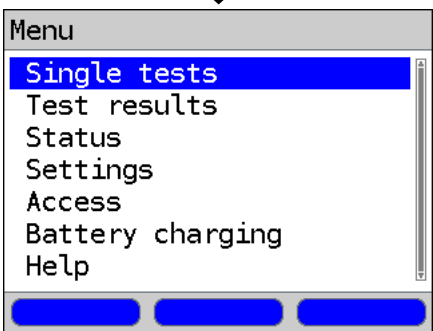- Status (in the example: Power down)

- DC voltage on the interface

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 30.

Main Menu

Menu

Single tests
Test results
Status
Settings
Access
Battery charging
Help

The various submenus available for the selected type of access are shown in the Main Menu.

Opens the marked menu (in this example, Single Tests).

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

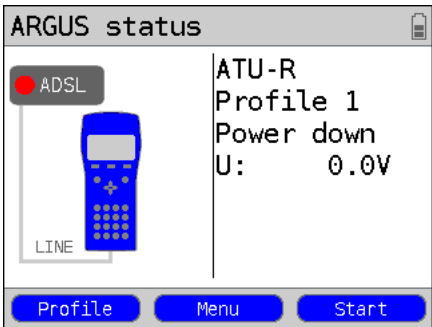to return to the previous menu (in the example, the State Display).

Note:
Starting functions with the numeric keys / key combinations
The ARGUS keypad can be used to call up or start the main functions and/or tests directly.
An overview of the available key combinations can be found on page 106.

7.2 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 (see page 205). The procedure for changing a setting will be illustrated with a single example:

ARGUS - State Display

ARGUS - Main Menu
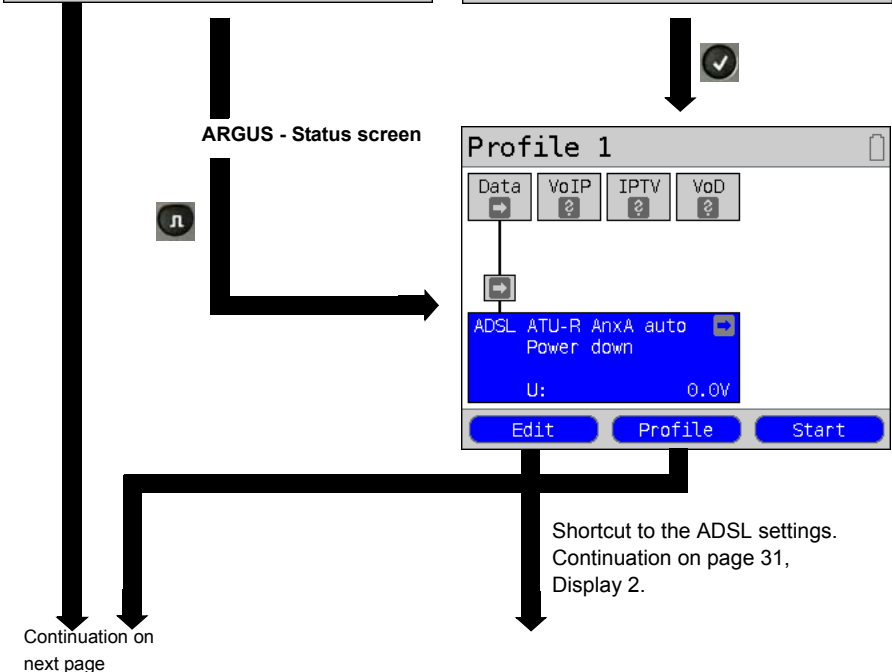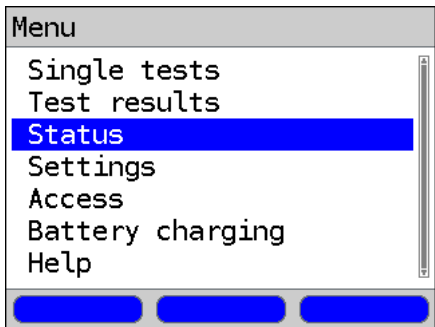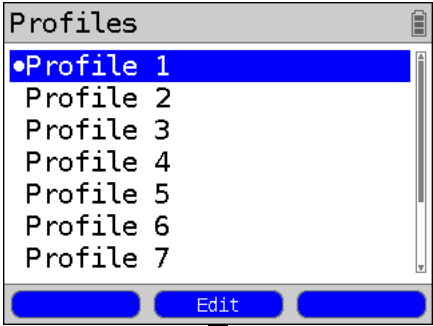
ARGUS - Status screen

```
Profiles                    ▯
●Profile 1
 Profile 2
 Profile 3
 Profile 4
 Profile 5
 Profile 6
 Profile 7
            Edit
```

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).

```
Profile                     ▯
 Access parameters
 Bridge/Router
 Test parameters
 Profile name
```
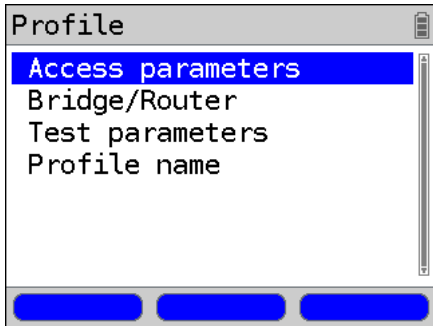
e.g. select Access parameters

```
Access parameters           ▯
 Phys. parameters
 Data service
 VoIP service
 IPTV service
 VoD service
```
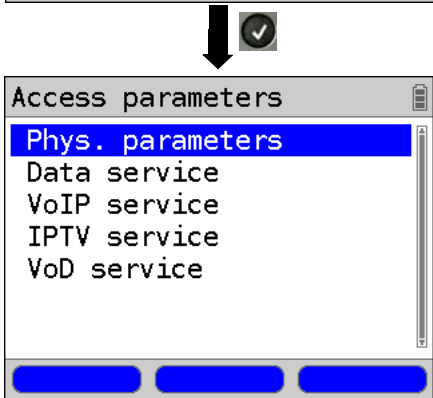
e.g. select the Phys. parameters

Continuation on next page

```
Phys. parameter
 ADSL
 VDSL
 Ethernet
 MAC address
```

e.g. select ADSL

```
ADSL setting
 ADSL mode
 Annex B firmware
 Rated value
 INP/SNRM
```
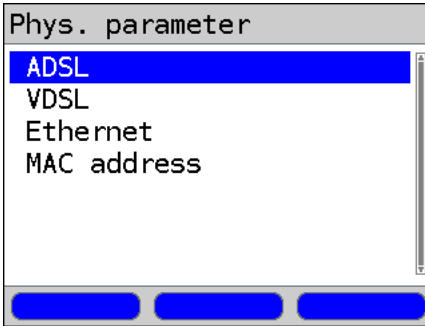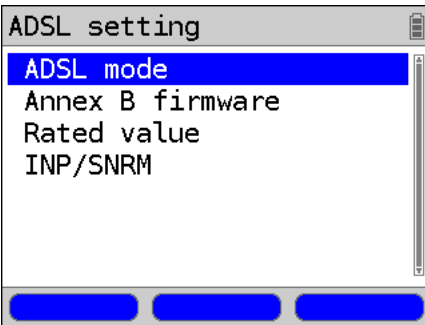
Continuation of the `<Edit>` shortcut on page 29.

e.g. select ADSL mode

```
ADSL mode
 Annex A/M auto
 Annex B/J auto
•Annex A auto
 Annex B auto
 Annex M auto
 Annex A ADSL2+
 Annex A ADSL2
```
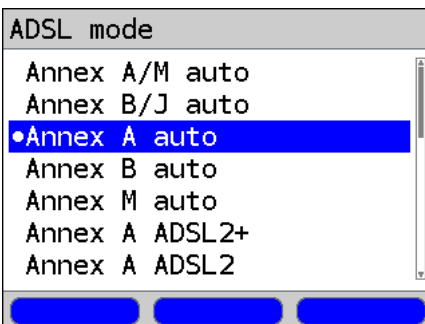
Select ADSL mode (in the example, Annex A auto). The default setting will be marked in the display with a ●.

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.

Setting	Explanation
Access parameters:	
Phys. parameters:	
ADSL:	Access parameters for the ADSL connection
ADSL mode	Different ADSL modes can be selected depending on the variant of the ARGUS. The selected ADSL mode must be compatible to ATU-C (network-side). If an ADSL auto-mode is selected (Annex A/M auto, Annex B/J auto, Annex A auto, Annex B auto or Annex M auto), the ARGUS will automatically determine the configuration at the DSLAM and make the corresponding settings. Default setting: ***Annex A auto***
Annex B firmware	Select the version in the ADSL Annex B firmware. Releases R4 and R5 are available to choose from. For more information, please contact us. Default setting: ***R4***
Rated value	Use the keypad to enter the upstream and downstream comparison values for the ATM bitrate [kbit/s]. If the current bitrates on the ADSL connection exceed the rated (threshold) values, the ARGUS Status will show "OK", otherwise "FAIL" will be displayed. Default setting: ***d: 0*** and ***u: 0***
INP/SNRM	Determines how any free line capacity will be used by a connection. Favour DS INP: The downstream INP will be increased to a value greater than the minimum INP set for ATU-C. Favour DS SNRM: The downstream SNRM will be increased to a value greater than the DS Target SNRM set for ATU-C. Whether the free line capacity can be used will depend on ATU-C and its configuration. Default setting: ***Favour DS INP***

MAC address:	
	Display and selection of the MAC addresses.
	The first two MAC addresses cannot be changed manually.
	1. If the default MAC address is selected, the ARGUS will use its own MAC address.
	Default setting: ***Default MAC address***
	2. If Dynamic MAC Address is selected, a different MAC address will be used for each synchronization.
	3. A third MAC address can be entered: Mark a line and then press `<Edit>`.
	`<Edit>` — Edit the MAC address for the entry. Enter the address in hexadecimal from the keypad and the softkeys `<A..F>` (e.g. to enter a "C" press the softkey three times or for an "F" six times; conclude by pressing `<OK>` to confirm your entry). Group MAC addresses cannot be used. Default setting: ***00:00:00:00:00:00***
	☑ — Use the address. The new address is only saved temporarily and will not be available when the ARGUS is switched on again.
	One after the other ✱ and ① Displays the ARGUS MAC addresses: Line, LAN, see also page 106 f.
Bridge/Router:	
Ethernet:	
Auto-negotiation	Switch on or off If autonegotiation is enabled, a network card can independently determine the correct transmission speed and duplex setting for the network port to which it is connected and can then configure itself accordingly. In the case of Ethernet, autonegotiation is based on Layer 1 of the OSI Model (in accordance with the IEEE 802.3u standard). Default setting: ***On*** (see page 79)
IPv4:	
IP mode	Setting the assignment of the IP addresses
	Static IP: Static IP addresses DHCP server: IP address assigned by ARGUS Default setting: ***DHCP server***

Local IP address	Own local IP address of the ARGUS Range: 0.0.0.0 to 255.255.255.255 Default setting: *192.168.10.1* (see RFC 3330 regarding assignment)
IP netmask	IP netmask Range: 0.0.0.0 to 255.255.255.255 Default setting: *255.255.255.0* (see RFC 3330 regarding assignment)
DHCP server	Options for the DHCP Server: - Start and End IP addresses Range: 0.0.0.0 to 255.255.255.255 Default setting: (see RFC 3330 regarding assignment) Start: *192.168.10.30* End: *192.168.10.40* - Name of the domain - Reserve time of the IP addresses Range: 1 to 99999 hours Default setting: *240*
Router:	
NAT	NAT (Network Address Translation) on or off The Router's NAT service automatically and transparently replaces the address information (e.g. the IP addresses of the LAN) with other address information (e.g. the IP addresses of the WAN). Default setting: *NAT on*
SIP port	The port used for the incoming SIP signaling. NAT on 0 to 65535 Default setting: *5060*

For information on other access parameters, see chapter 10 Virtual Lines (VL) page 82.

7.3 The ARGUS in the ATU-R Access Mode

Determining the ADSL connection parameters

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.

⚠ **Use only the cable included in the package!**

xDSL cable or patch cable

Line
jack

ADSL access
ATU-C (DSLAM)
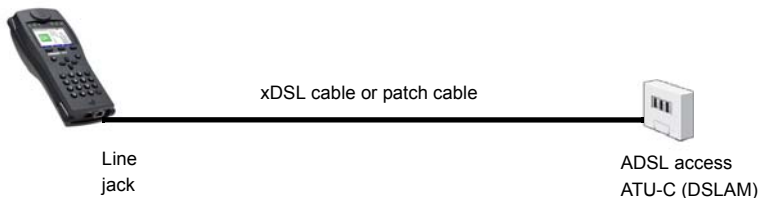
Setting the ATU-R access mode:

| Access | ADSL access |

⬇ ✓

| ADSL | or |

⬇ ✓

and ARGUS - Status screen
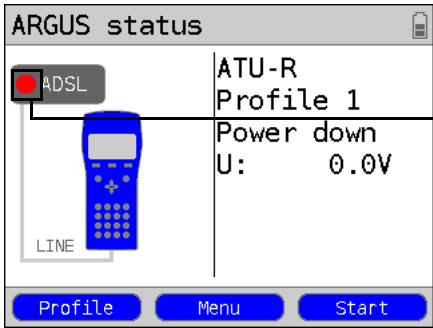
Access mode:

ATU-R
ATU-R bridge
ATU-R router

Continuation on
next page ⬇ ✓

The ADSL test is not yet started: red LED in the display.

Key to the LED symbolized in the display:

Red LED	no test started
Yellow LED	test started
Green LED	A connection has been setup.
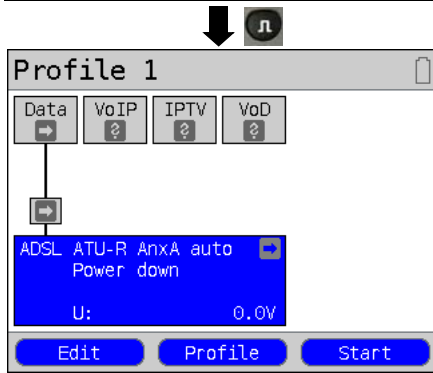
All further functions and procedures will be explained on the basis of this Status screen.

Setting up an ADSL connection

Profile settings:

When setting up the ADSL connection, the ARGUS uses the settings saved in the profile (see page 31): ADSL mode, rated value, Annex B firmware and INP/SNRM.
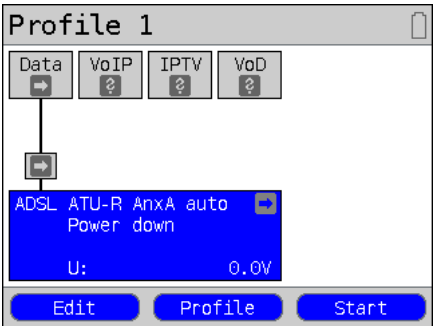
ARGUS - Status screen

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

Profiles

```
●Profile 1
 Profile 2
 Profile 3
 Profile 4
 Profile 5
 Profile 6
 Profile 7
```
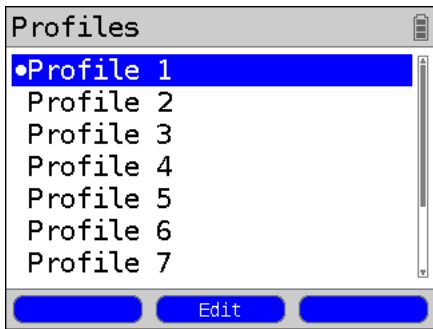
Edit

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

Profile 1

Data	VoIP	IPTV	VoD

```
ADSL ATU-R AnxA auto
     Initialize

  U:            0.0V
```

Info   Stop

or

ADSL Line

```
 Silent
 Annex A auto
Act.time:   0:00:04
```

Trace

Display the profile.

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

Mark the profile.

<Edit> Open the marked profile for editing.
The settings of the selected profile can be edited here (see page 30).
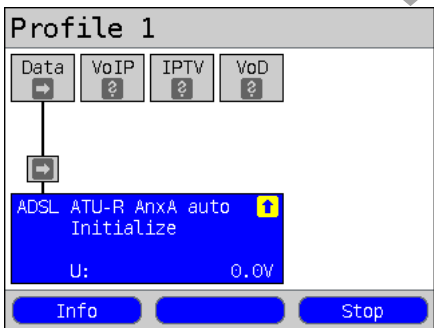
Setting up an ADSL connection

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 "Initialize") in the Layer 1 box (blue).
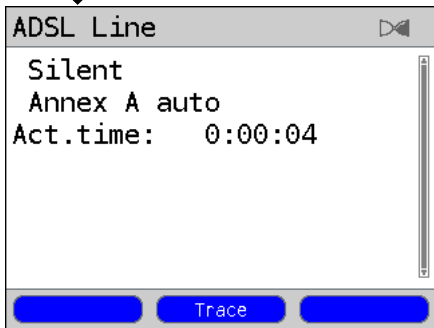
While setting up the connection:
Display:

- Current connection status

- ADSL mode

- Time elapsed since the start of synchronisation in h:min:sec.
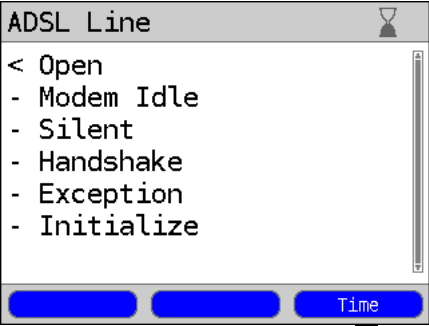
Continuation on next page

```
ADSL Line                    ⏳
< Open
- Modem Idle
- Silent
- Handshake
- Exception
- Initialize

[          ] [          ] [  Time  ]
```

Command symbols:

< = command sent from the ARGUS

> = command sent from the DSLAM

- = connection status

Display timestamp.

```
ADSL Line                    ⏳
< Open
   09:58:00:000
- Modem Idle
   09:58:00:000
- Silent
   09:58:01:960
- Handshake

[          ] [          ] [          ]
```
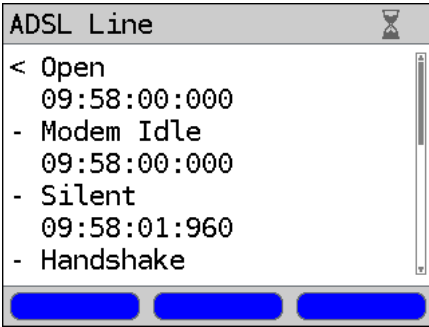
The ARGUS shows the time when (internal clock, see page 203) the command arrived.

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.
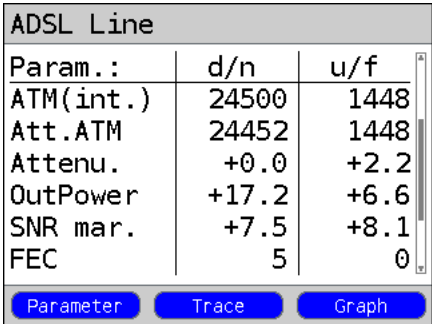
Profile 1

Data	VoIP	IPTV	VoD

ADSL ATU-R Anx A(2+) ✓
kb/s: 25399/ 1236
CRC: 0/ 18685
U: -0.5V

| Info | Test | Stop |

or   ⏻

ARGUS - Status screen.
Display shows (Layer 1 box):
- Access and Access mode
- ADSL mode
- d: Downstream data rate
  u: Upstream data rate
- Number of CRC errors in downstream and upstream data
- Interface's DC voltage

If the current data rate exceeds the rated (threshold) value set (see page 32), the ARGUS will display a green "OK" in the ARGUS status (see page 28) otherwise it will show a red "FAIL".

<Info>   Display the ADSL connection parameters

<Test>   Display the available tests, see page 104

<Stop>   Clear down the ADSL connection
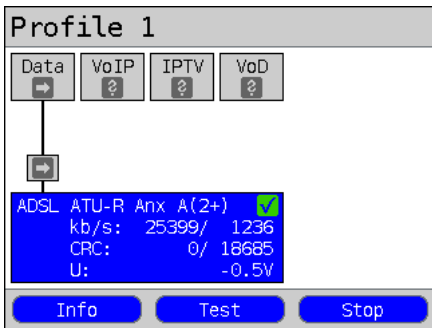
ADSL Line

Param.:	d/n	u/f
ATM(int.)	24500	1448
Att.ATM	24452	1448
Attenu.	+0.0	+2.2
OutPower	+17.2	+6.6
SNR mar.	+7.5	+8.1
FEC	5	0

| Parameter | Trace | Graph |

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, see page 38.

<Graph>   Display the graphs, see page 41.

ADSL parameters		
ATM bitrate		d|u
[kbit/s]	24500	1448
Attainable ATM		d|u
[kbit/s]	24456	1448
Relative capacity		d|u
[%]	100.1	100.0
Lat.mode: Interleaved		

| Statistic | Reset | |

Display the connection parameters in long form for both downstream (d) and upstream (u), see table page 48.

n/a not available

n/u not used

n/r not received

Scroll through parameter display

<Reset> Resets (zeros) the error counters: FEC, CRC, and HEC.

Statistics		
ATM		Rx|Tx
ATM Cells	0	0
OAM Cells	0	0
User VCC	0	0
AAL5 PDUs	0	0

Display ATM statistics:

ATM Cells:
The ARGUS will display the number of ATM cells received (Rx) and sent (Tx).

ATM Information:
The ARGUS will display the ATM information received (Rx) and sent (Tx) such as:
- number of OAM cells
- number of user-side VCCs
- number of AAL5 PDUs

Statistics	
Unmapped Cells	
Rx	0
VPI unmapped	
Rx	0
VCI unmapped	
Rx	0

Other ATM information:
- Received (Rx) unmapped cells
- Received (Rx) unmapped VPI
- Received (Rx) unmapped VCI

Continuation on next page

ADSL parameters

ATM bitrate		d|u
[kbit/s]	24500	1448
Attainable ATM		d|u
[kbit/s]	24456	1448
Relative capacity		d|u
[%]	100.1	100.0
Lat.mode: Interleaved		

[Statistic] [Reset] [ ]

Display the connection parameters in long form for both downstream (d) and

upstream (u), see table on page 48.

n/a   not available

n/u   not used

n/r   not received

Scroll through parameter display

<Reset>   Resets (zeros) the error counters: FEC, CRC, and HEC.

<Statistic> Display the ATM statistics.

Reset the error counters (FEC, CRC and HEC).
CAUTION: Once showtime has been reached, the ARGUS will automatically reset the error counters.

ADSL Line

Param.:	d/n	u/f
ATM(int.)	24500	1448
Att.ATM	24452	1448
Attenu.	+0.0	+2.2
OutPower	+17.2	+6.6
SNR mar.	+7.5	+8.1
FEC	5	0

[Parameter] [Trace] [Graph]

Bits/tone

[Menu] [ ] [Continue]

Display the bit distribution, e.g. bits transported per carrier frequency (tone).
y-axis: bits
x-axis: tones (channels)
Based on the bit distribution, it is possible to detect line disturbances (e.g. through

HDB3, HDSL, RF, DPBO etc.)

The ARGUS will return to the previous display

<Continue> Open next graphic
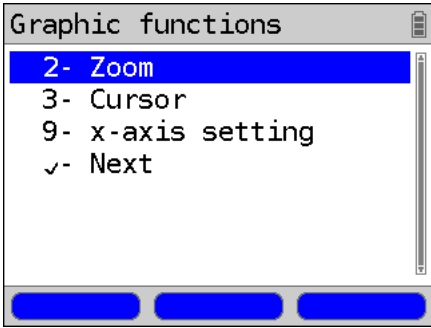
Continuation on next page

Graphic functions:

Graphic functions

```
2- Zoom
3- Cursor
9- x-axis setting
√- Next
```

The graphic functions like Zoom, Cursor and Setting of the x-axis allow detailed analysis of the graphs.

❌ Exit menu without making changes.
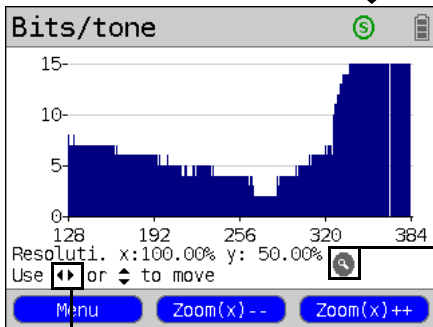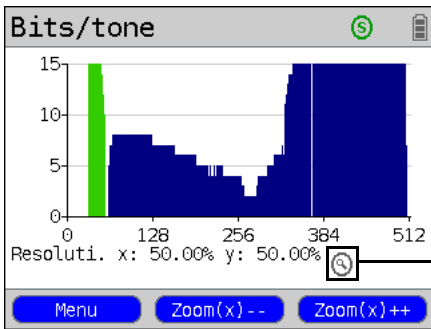
2 Using these numeric keys the Zoom function can also be activated within a graph.

3 The Cursor function is described on page 44.

9 A description of how to change the units shown on the x-axis from tone to frequency can be found on page 44.

✅ All of the settings made for view-ing this graph will also be applied to the next one opened.

Bits/tone

Resoluti. x: 50.00% y: 50.00%

Menu   Zoom(x)--   Zoom(x)++

The magnifying glass is shown in the display on a white background.
The Zoom function is not active in this graph.

`<Zoom(x)++>` Enlarges the central section of the graph (100%)

`<Zoom(x)-->` Deactivates `<Zoom(x)++>` and ceases enlargement.

Bits/tone

Resoluti. x:100.00% y: 50.00%
Use ◄► or ▲▼ to move

Menu   Zoom(x)--   Zoom(x)++

If the magnifying glass is shown in the display on a dark background, zoom is active.

The cursor keys can be used to move horizontally through the zoomed area.

The is used to switch the softkey assignment. The ARGUS will switch from x-axis zoom to y-axis zoom.
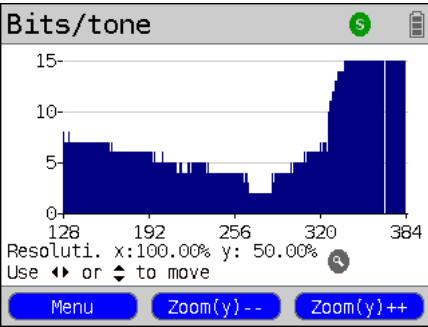
<Zoom(y)++> Enlarges the central section of the graph (100%)

<Zoom(y)--> Deactivates **<Zoom(y)++>** and ceases the enlargement.

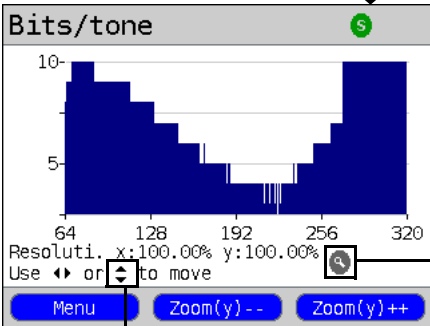If the magnifying glass is shown in the display on a dark background, zoom is active.

The cursor keys can be used to move vertically through the zoomed area.
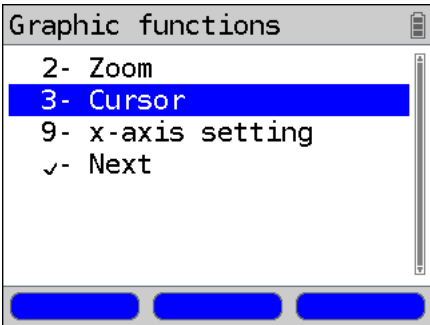
The Cursor function is used to precisely measure graphs.

Continuation on
next page
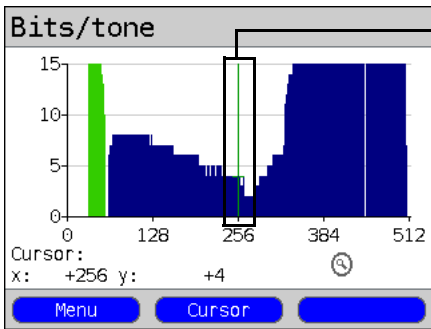
Bits/tone

Cursor:
x: +256 y: +4

| Menu | Cursor | |

Once the Cursor function is started, a green Cursor line will be displayed in the middle of the graphic.

<Cursor> Using the Cursor softkey, it is possible to switch the cursor on or off as needed once it has been activated from the menu.

The value of the graph at the cursor's current position will be displayed below the graph as follows:

x: 256th Tone

y: 4 Bits

Using the cursor keys "left" and "right", the cursor can be moved to any point in a graph to measure it. Briefly tapping the cursor key will move the Cursor one position further in the graph. The Cursor will move in ever larger steps if you press and hold the cursor key down.

Graphic functions

2- Zoom
3- Cursor
9- x-axis setting
✓- Next
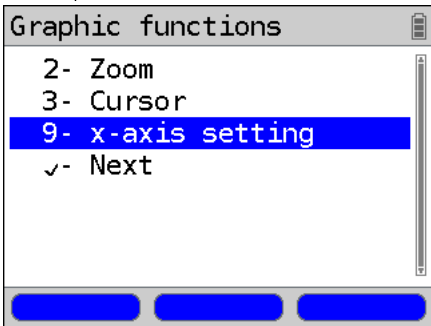
The menu item x-axis setting can be used to change the x-axis label from Tone to Frequency.

x-axis setting
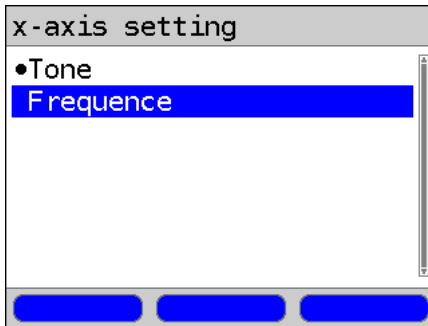
•Tone
Frequence

Possible selections:

Tone: Display the value of the x-axis as tones.

Frequency: Display the value of the x-axis as frequencies.

Set the x-axis directly

↓ ✓

Graphic functions

↓ ✕

Bits/tone

Cursor:
x: +328 y: +6

Menu   Cursor
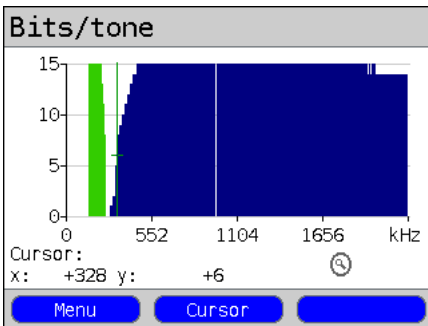
Using the cursor keys "left" and "right", you can scroll through the zoomed area (in this example, frequency).
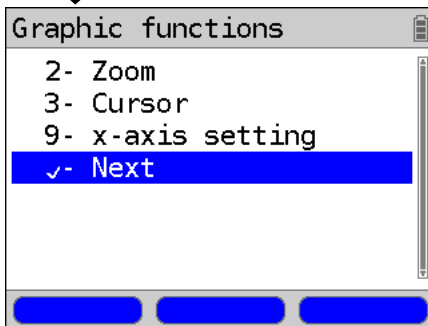
Graphic functions

2- Zoom
3- Cursor
9- x-axis setting
✓- Next

The Zoom and Cursor functions can also be used in combination. As an example, it is easier to measure a specific point in a graph with the Cursor function if you have first zoomed in on the area. The zoomed area will not necessarily be centered on the Cursor. The graphic functions are available for any graph.

Continuation on next page ↓ ✓

Other result graphs

SNR/tone
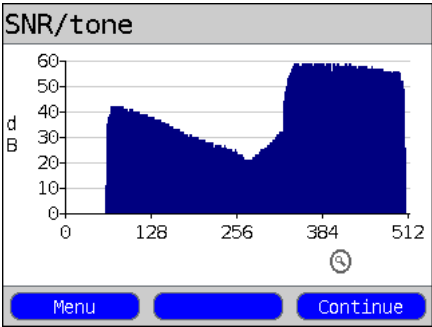
Display of the signal-to-noise ratio (SNR) for each tone
y-axis: SNR in dB
x-axis: Tones (channels)

In this manner, it is possible to detect interference on individual tones (channels), in this example DPBO (Downstream Power Backoff).

<Menu> Opens the Graphic functions, see page 42).

QLN/tone
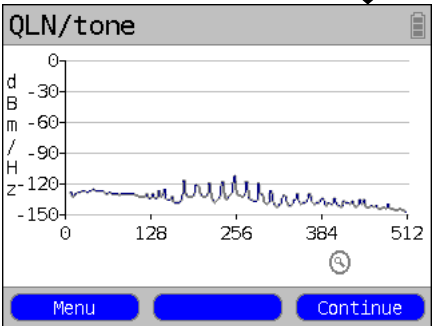
Display the quiet level noise (QLN) for each tone. The QLN displays the quiet level noise of the wire pair as function of the frequency.
y-axis: QLN in dBm/Hz
x-axis: tones (channels)

Based on the QLN it is possible to detect narrow-band interference caused by, for example, a medium-wave radio station or a defective switching power supply. Such interference will appear as small peaks. The example shows a line with interference from a power supply.

<Menu> Opens the Graphic functions, see page 42).

HLOG/tone
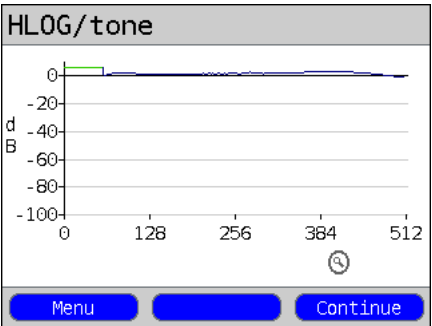
Display of the amplitude component of the transfer function (HLOG) for each tone. The HLOG shows the attenuation of a line for each frequency.
y-axis: Hlog in dB
x-axis: Tones (channels)

Continuation on
next page

Example: skew + bad contact

HLOG/tone

```
   0
 -20
d
B -40
 -60
 -80
-100
     0    128   256   384   512
```

Menu _____ **Continue**
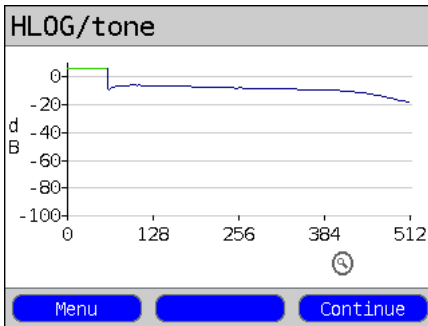
If a line is in good condition, the values will fall as the frequency rises; for a very short line, they will be nearly horizontal. In this example, a short line is shown. The upstream and downstream values from the DSLAM and the downstream values calculated by the ARGUS may sometimes be skewed in the HLOG graphs. Other times the DSLAM may not send the upstream value of the HLOG or may even send one that is false.

DSL connections are often possible even though one of the two wire pairs is high impedance or even open (with just capacitive coupling). Such defective lines commonly cause frequent interruptions and/or loss of data. The following can cause such problems: oxidized access lines, bad contacts in the telephone wallsockets, loose terminal clamps or badly insulated lines. In such cases, the attenuation on the line is higher for low frequencies than it is for high frequencies. This can be recognized by the unusual relationship between the upstream and downstream attenuation or nature of the HLOG curve. Where the problem is caused by one of the wires, the attenuation is often lower for low

frequencies than for higher frequencies.

\<Menu\> Opens the graphic functions (see page 42).

\<Continue\> ARGUS will return to the Bits/tone graphs.

Example: Bridge tap

HLOG/tone

```
 -20
 -25
d
B -30
 -35
 -40
 -45
     0    552   1104  1656  kHz
Cursor:
x:  +535 y:  -33.1
```

Menu **Cursor** _____
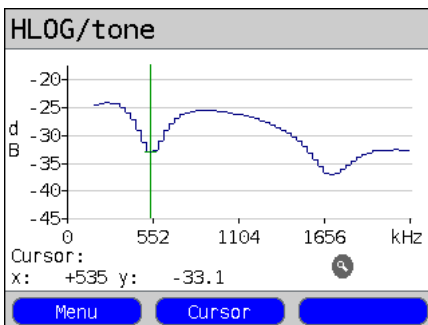
The example at the side shows what is known as a drop. This may indicate a stub line (bridge tap).
Using the rule of thumb:
L[m] = 50 / f [MHz],
and knowing the frequency in MHz (in this example 0.535 MHz), it is possible to estimate the approximate length of the stub line:
L [m] = 50 / 0.535 MHz = 93 m
There is a stub line of approximately 93 m in length.

The ARGUS determines the following ADSL connection parameters:

ADSL connection parameters:	
ATM	The actual usable ATM bitrate in kbit/s.
Attainable ATM	This is the theoretically attainable bitrate in kbit/s.
Relative capacity	Utilization of the line as a percentage.
Latency mode	Depending on the configuration of the DSLAM, the ARGUS will display either Interleaved or Fast.
Attenuation	The line's attenuation in dB over its entire length and bandwidth. Certain types of access are not suitable where the line attenuation is particularly high. When considering the attenuation values to determine the recommended access types, it is better to use the dB values in the Hlog graphs with a 300 kHz cursor setting.
Output power	Output power in dBm referenced to 1 mW.
SNR margin	Signal-to-noise margin in dB The SNR margin is a measure of how much additional noise the transmission can withstand and still achieve a BER (Bit Error Rate) of 10^{-7}. This value is the amount of reserve that a line has to deal with interference. Rule of thumb: The SNR margin downstream should be at least twice the SNR margin upstream or more.
Impulse noise prot.	The Impulse Noise Protection (INP) is an indicator of the quality of the protective mechanism as far as impulse noise is concerned. The number of DMT symbols, which can be completely distorted in succession, without an error occurring on the higher layers.
Interleave delay	This is the delay (in ms) caused by interleaving the data blocks.
FEC	Forward Error Correction The number of transmission errors corrected using the cell checkbytes. f (far): Errors that the DSLAM has detected and informed the ARGUS. n (near): Errors which were detected by the ARGUS in the blocks it received.
CRC	Cyclic Redundancy Check The superframe checksum sent from the opposing end does not match the one calculated locally. Possible cause: Fault on the line.

	f (far): Errors that the DSLAM has detected and informed the ARGUS.
	n (near): Errors which were detected by the ARGUS in the blocks it received.
HEC	Header Error Checksum
	The number of ATM cells with bad header checksums.
	f (far): Errors that the DSLAM has detected and informed the ARGUS.
	n (near): Errors which were detected by the ARGUS in the blocks it received.
Reset	Shows how often the error counters have been reset by the user with the **<Reset>** softkey.
Resync:	Number of times that the ARGUS has been resynchronized.
Vendor far:	The manufacturer of the ATU-C-side, see page 217 for more information.
Version:	Vendor Specific Information, generally shows the version of the software running at the ATU-C (DSLAM) end.
Vendor near:	Manufacturer of the ARGUS chipset (ATU-R), see page 217 for more information.
Version:	Vendor Specific Information, shows the software version of the ARGUS.

System information regarding the transmission to the remote end in ADSL

Usually, when a modem synchronizes with a DSLAM, information on the manufacturer and type of modem will be sent to the DSLAM's control system. In the case of ADSL, this is performed in accordance with ITU-T G.997.1. If an ARGUS is synchronizing with a DSLAM, it will - depending on the DSLAM - send the following to the control system:

Info	Displayed at the DSLAM	Meaning
System Vendor ID	0x04, 0x00 (hex)	Country Code: Germany
	INGE or 0x49, 0x4E, 0x47, 0x45 (hex)	Provider Code: intec Germany
	0x20, 1x00 (hex)	System-FW-Version: 2.10.0
Version Number	R2.10.00 U_	Device-FW-Version: 2.10.0
Serial Number	ARGUS1419999	Device Type: ARGUS 141 / Device serial number 9999

Clear down the ADSL connection and save the reports

Profile 1	ARGUS State Display
Data	VoIP	IPTV	VoD	
ADSL ATU-R Anx A(2+) ✅	
kb/s: 25399/ 1236	
CRC: 0/ 18685	
U: -0.5V	
Info Test Stop	Clear down the ADSL connection.

Profile 1

Data VoIP IPTV VoD

ADSL ATU-R Anx A(2+) ✅
 kb/s: 25399/ 1236
 CRC: 0/ 18685
 U: -0.5V

Info   Test   Stop
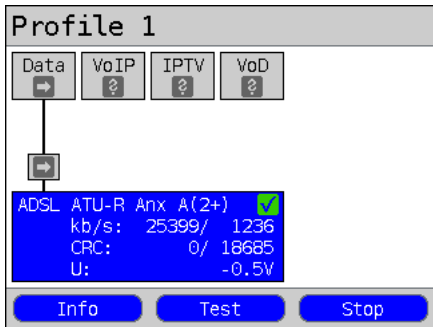
ARGUS State Display

Clear down the ADSL connection.

ARGUS info

Save test report?

No   Yes
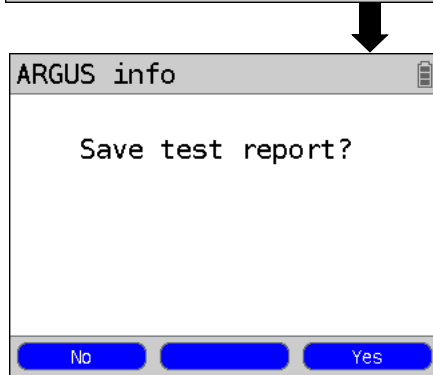
| **<No>** | The results will be discarded. |
| **<Yes>** | Save results |

save as:

AMP_1█

Delete   ab>AB
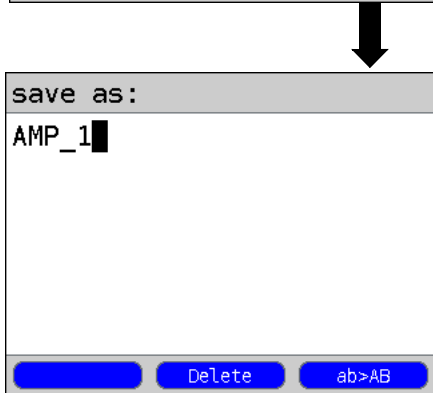
The ARGUS saves the ADSL connection parameters together with the trace data in the first available memory location. The memory location can be given any name desired (see page 198).
Default setting: AMP_1, AMP_2....
If the memory is full, you must manually select a memory location to be overwritten.

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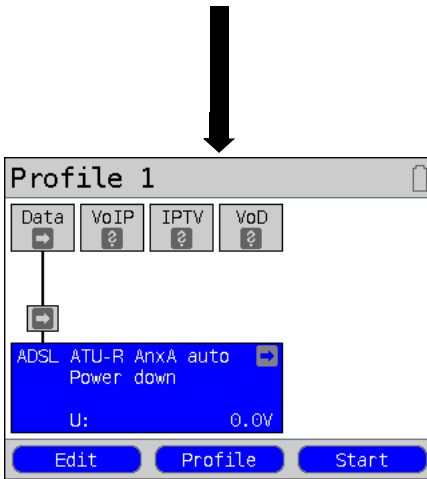
Once the results have been successfully saved in memory, the ARGUS will return to the Status screen or ARGUS State Display.
A new sync attempt can be started by pressing **<start>**.

Displaying the saved test reports

| Test results | ARGUS - Main Menu |

Test results
1 AMP_1
2 empty
3 empty
4 empty
5 empty
6 empty
7 empty

Mark the saved test results.

<Date>   Display of the date and time that the results were saved.

| Date |

| View |

Test No.: 1
Act.time: 0:01:04
ADSL2+ Annex A
Showtime: 0:00:39
Rated value comp.   d|u
OK | OK

| Conti. |

Display the test results:
The ARGUS displays the ADSL state and the ADSL connection parameters.

Scroll through the ADSL connection parameters.
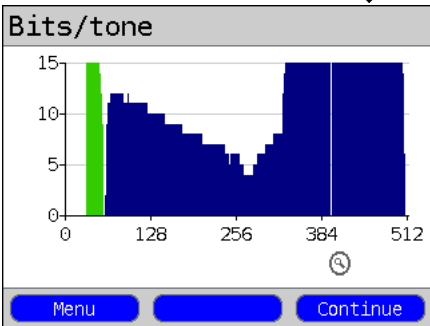
| Bits/tone |

Bit distribution display (Bits/tone)

<Continue> Display of the signal-to-noise ratio for each tone (SNR / tone), the QLN / tone, the Hlog / tone and the trace data.

Close the results display.

| Menu | | Continue |

7.4 The ARGUS in the ATU-R Bridge Access Mode

Connect the ARGUS to the ADSL access using the xDSL cable and to the PC with a patch cable.

In Bridge mode, the ARGUS acts like an ADSL modem, i.e. the ARGUS passively passes all packets from the Ethernet side to the ADSL access (and vice versa). In this case, the PC is responsible for setting up the connection.

Settings			
Bridge/Router	**Ethernet**	Autonegotiation On / Off, see page 79.	
	IPv4	- IP mode:	Static IP ***DHCP server***
		- Local (own) IP address - IP netmask - DHCP server:	Start / end address Domain Reserve time

Setting the access mode to ATU-R Bridge:

Access	

ARGUS - Main Menu

⬇ ✓

ADSL	

or

⬇ ✓

🔆 and 📞 in the Status screen.

Access mode:

 ATU-R
 ATU-R bridge
 ATU-R router

⬇ ✓

ARGUS status

ADSL   ETH

ATU-R BR
Profile 1
Power down
U: 0.0V

LINE   LAN

| Profil | Menu | Start |

The test is not yet started: red LED in display
Key to the LED symbolized in the display**:**

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

Display:
- Access mode
- Default (preset) profile, see page 30
- Current State
- Interface's DC voltage

Profile 1

| Data ✕ | VoIP ⁇ | IPTV ⁇ | VoD ⁇ | Bridge ➡ |

➡

ADSL ATU-R AnxA auto
Power down

U: 0.0V

| Edit | Profil | Start |

Set up an ADSL connection

Using the cursor keys, select Bridge (see page 83).

The 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.

Display shows (Layer 1 box):

- Access mode
- ADSL mode
- Current State
- Interface's DC voltage

Profile 1

| Data ✕ | VoIP ⁇ | IPTV ⁇ | VoD ⁇ | **Bridge ➡** |

➡

ADSL ATU-R Anx A(2+) ✓
kb/s: 25399/ 1303
CRC: 0/ 18685
U: -0.4V

ETH ➡
Autoneg.

| Edit | | Start |

Set up an ADSL Bridge

The ADSL connection has been setup (green check mark in the Layer 1 box).

<Edit> Setting the Bridge/Router parameters

The bridge can also be activated directly. If Layer 1 has not yet been setup, it will be setup automatically.

<Stop> Deactivate Bridge mode.

<Info> This displays the Bridge mode activity.

Profile 1

| Data | VoIP | IPTV | VoD | **Bridge ✓** |

✓

ADSL ATU-R Anx A(2+) ✓
kb/s: 25399/ 1303
CRC: 12/ 18685
U: -0.4V

ETH ✓
100Mb/s
D: full
F: on

| Info | | Stop |

When the active ADSL physical line is in Bridge mode, the following tests may started using the **<Test>** softkey, see page 104.

⚠ When Bridge mode is active no tests are available.

Display the connection parameters

Profile 1

				Bridge
Data	VoIP	IPTV	VoD	✓

ADSL ATU-R Anx A(2+) ✓
kb/s: 25399/   1303
CRC: 12/ 18687
U: -0.4V

ETH   ✓
100Mb/s
D: full
F: on

Info   Stop

<Info> Display the ADSL
or   connection parameters,
🔲   see page 39.

<Stop> Clear down the ADSL
            connection and automatically
            deactivate the bridge.

7.5 The ARGUS in the ATU-R Router Access Mode

Connect the ARGUS to the ADSL access using the xDSL cable and to the PC with a patch cable.

In Router mode, the ARGUS replaces not only the modem but also the router. In this case, several PCs (connected via a hub/switch) can access the connection via a network connection. The network IP addresses can either be assigned statically or the ARGUS can serve as a DHCP server and assign IP addresses to the connected PCs.

⚠ **The ARGUS does not have a firewall!**
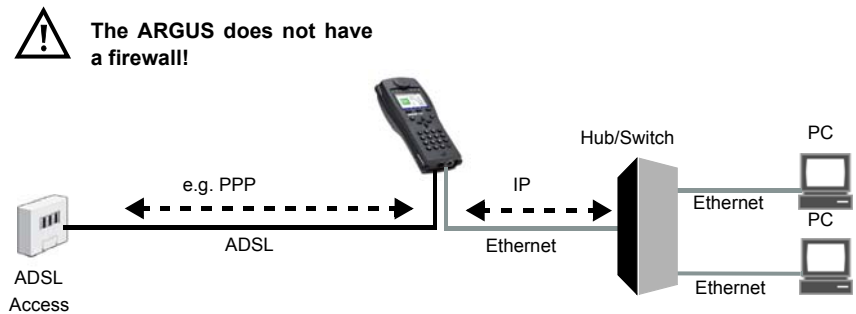
Bridge/Router settings, see page 33:.

Settings			
Bridge/Router	**Ethernet**	Autonegotiation On / Off, see page 79.	
	IPv4	- IP mode: - Local (own) IP address - IP netmask - DHCP server:	Static IP *DHCP server* Start / end address Domain Reserve time
	Router	- NAT On / Off - SIP port	

ADSL settings, see page 32:

Setting			
Access parameters	**Phys. parameters**	ADSL	ADSL mode Annex B firmware Rated value INP/SNRM

Setting the access mode of the ATU-R Router:

| Access | ARGUS - Main Menu |

| ADSL | or |

 and in the Status screen.

| ATU-R Router |
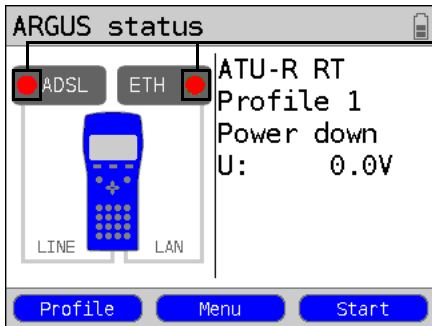
The test is not yet started:
red LED in display
Key to the LED symbolized in the display:

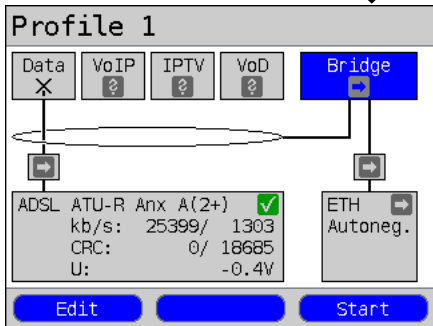| Red LED | no test started |
| Yellow LED | test started |
| Green LED | A connection has been setup. |

Display:
- Access mode
- Default Profile (Profile 1)
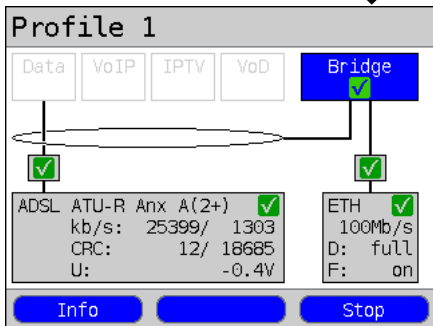- Current State
- Interface's DC voltage
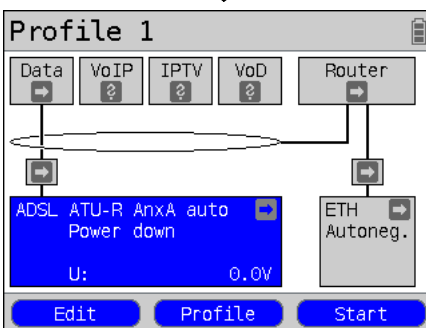
The test is not yet started:

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.

Display shows (Layer 1 box):
- Access mode
- ADSL mode
- Current State
- Interface's DC voltage

<Profile> Open profile see page 36

Using the cursor keys select the Virtual Line and then use the softkey to open the Router display, see page 83.

Setting up an ADSL connection

Profile 1

Data	VoIP	IPTV	VoD		Router

```
ADSL ATU-R Anx A(2+)  ☑        ETH  ➡
      kb/s:  26575/  1250      Autoneg.
      CRC:     878/     0
      U:               0.0V
```

| Edit | | |
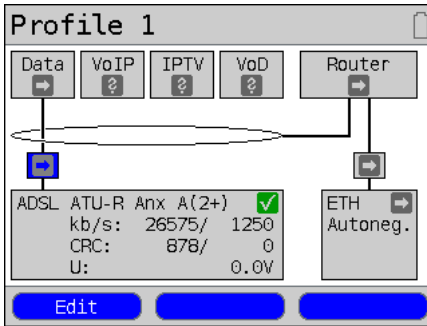
Use the cursor keys to select Router, see page 83.

When the active ADSL physical line is in Router mode, the following tests may started using the **<Test>** softkey, see page 104.
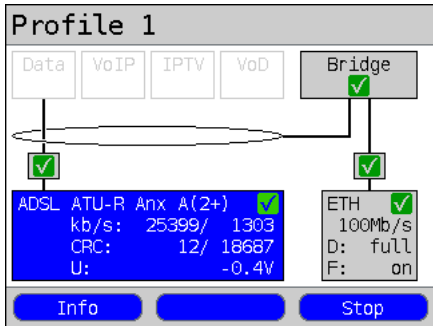
⚠ When Router mode is active, no tests are available from the Router.

Virtual Line selected

<Edit>   For details on setting the parameters, see chapter 10 Virtual Lines (VL) page 82.
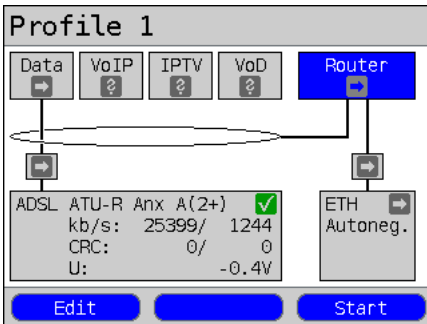
Profile 1

Data	VoIP	IPTV	VoD		**Router**

```
ADSL ATU-R Anx A(2+)  ☑        ETH  ➡
      kb/s:  25399/  1244      Autoneg.
      CRC:       0/     0
      U:              -0.4V
```

| Edit | | Start |

Router selected

The router can also be activated directly. If Layer 1 has not yet been setup, it will be setup automatically.

<Edit>   For details on setting the Bridge/Router parameters, see page 33.

Setup the ADSL Router.
The ADSL connection is active.

Displays and operation like those in Bridge mode, see page 55.

8 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 62.
                   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), see page 70.
                   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), see page 73.
                   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. when 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.

⚠️ The voltages on the subscriber line may not exceed 200 VDC and should be free of AC voltage.

The ARGUS operating temperature can be affected by a high data throughput using the VDSL interface. Operating the ARGUS permanently at its performance limit can cause the activation of the temperature-induced protective mechanism, described in the chapter safety instructions.

8.1 Setting the VDSL Interface and Access Mode

The VDSL interface and Access mode are configured in the same manner as an ADSL access, see page 28 et seq.

Note: Starting functions with the numeric keys / key combinations
The ARGUS keypad can be used to call up or start the main functions and/or tests directly. An overview of the possible key combinations can be found on page 104.

8.2 VDSL Settings

The VDSL settings are configured in the same manner as those for an ADSL access, see page 29 et seq..

Setting	Explanation
Access parameters:	
Phys. parameters:	
VDSL:	Access parameters for the VDSL connection
Rated value	Use the keypad to enter the upstream and downstream comparison values for the bitrate in kbit/s. If the current bitrates on the VDSL connection exceed the rated values, the ARGUS status will show "OK", otherwise "FAIL" will be displayed.Default setting: *d: 0* and *u: 0*
FW	Selection of the firmware (FW) in the VDSL chipset. The available firmware options are Feature Sets FS10.3 and FS10.4. For more information, please contact us. Default setting: *FS10.3*
Carrier Set	The Carrier Set sets the carrier frequencies that the ARGUS will use to signal the DSLAM that it is ready for synchronisation (ITU G.997.1). Normally, the network operator specifies which set should be used. The following sets with the associated upstream tones (the interval between the tones is 4.3125 kHz) can be selected on the ARGUS: - A43, Tones: 9, 17, 25 - B43, Tones: 37, 45, 53 - V43, Tones: 944, 972, 999 Default setting: *A43*,*B43, V43* When multiple sets are selected, the ARGUS will cyclically send the tones of the selected sets in parallel.

The MAC address and the access parameters for the Bridge/Router can be found in the chapter on ADSL, see page 33. For more on all other access parameters, see chapter 10 Virtual Lines (VL) page 82.

Especially in VTU-R Bridge mode, ARGUS is able to support a special VLAN handling, see table below:

Bridge:	
VLAN handling	If the VLAN method "tagging" is used, a VLAN tag will be added to the outgoing Ethernet frames (sent to the WAN-side) while VLAN tags will be removed from incoming Ethernet frames. When the bridge is "Transparent", the Ethernet frames will be passed on unchanged. Defaul setting: *Transparent*
VLAN ID	Identifier for the VLAN to which the frame belongs. Every VLAN is assigned a unique number, the VLAN ID. A device, which belongs to the VLAN with the ID = 1, can communicate with every other device in the same VLAN, but not with a device in other VLANs (i.e. one with a different ID such as 2). Range: from 0 to 4095 Default setting: *0*

8.3 The ARGUS in the VTU-R Access Mode

Determining the VDSL connection parameters
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!**

xDSL cable or patch cable

Line
jack

VDSL access
VTU-C (DSLAM)
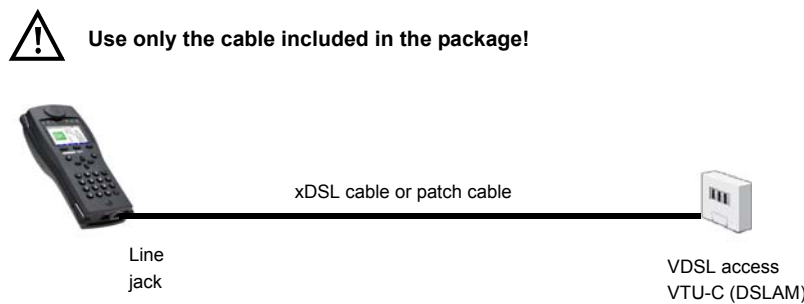
Setting the VTU-R access mode:
The VTU-R access mode settings are configured in the same manner as those for ATU-R, see page 35.

Setting up a VDSL connection

Profile settings:

When setting up the VDSL connection, the ARGUS uses the settings saved in the profile (see page 61).
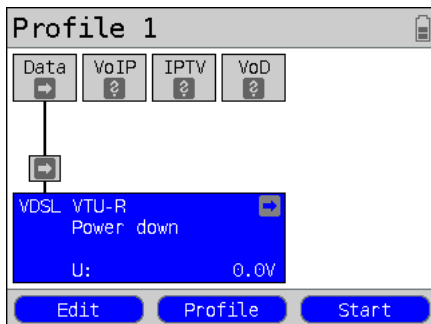
ARGUS - Status screen.

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

Setting up a VDSL connection

\<Edit\>   Open the access parameters, see page 61.

\<Profile\> Profile settings are like those for ADSL, see page 30.
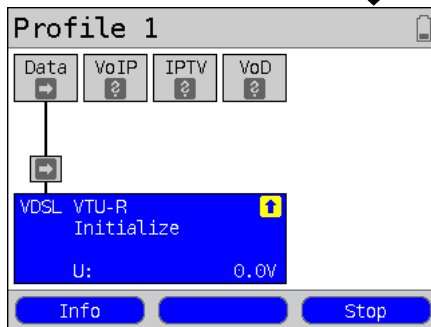
The ARGUS synchronizes with the DSLAM (the "Sync / L1" LED will flash and an element with a yellow background will be shown in the display).
The ARGUS will display the current connection status (in this example "Initialize") in the Layer 1 box (blue).
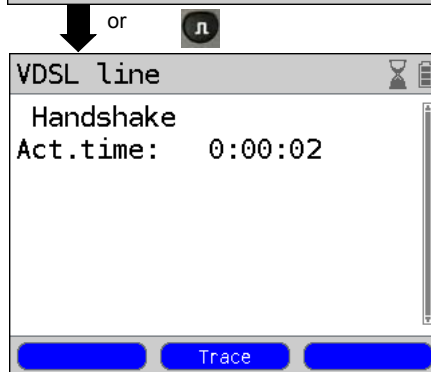
While setting up the connection:
Display:

- Current connection status

- Time elapsed since the start of synchronisation in h:min:sec.
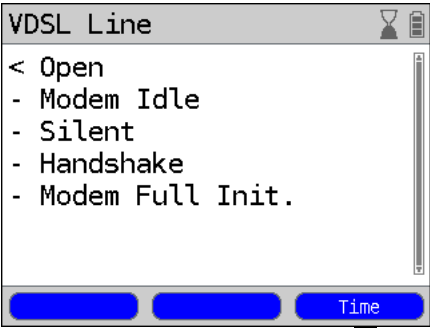
Continuation on next page

VDSL Line ⌛ 🔋

< Open
- Modem Idle
- Silent
- Handshake
- Modem Full Init.

[　　　　] [　　　　] [Time]

Command symbols:

< = command sent from the ARGUS

> = command sent from the DSLAM

- = connection status

Display timestamp.

VDSL Line ⌛ 🔋

< Open
　13:56:00:000
- Modem Idle
　13:56:00:000
- Silent
　13:56:00:000
- Handshake

[　　　　] [　　　　] [　　　　]
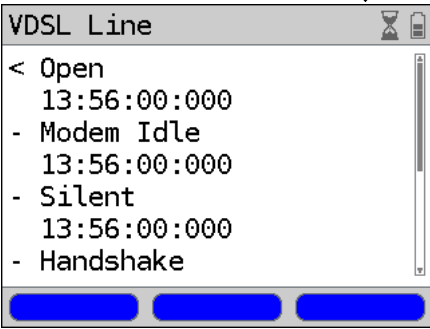
The ARGUS shows the time when
(ARGUS internal clock, see page 203) the
command arrived.

    ⊗   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.

ARGUS - Status screen

Display shows (Layer 1 box):

- 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 (in example, "17a").
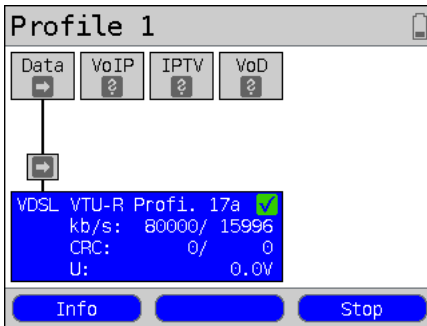
- d: Downstream data rate
  u: Upstream data rate

- Number of CRC errors in downstream and upstream data

- Interface's DC voltage

or

If the current data rate exceeds the rated value set (see page 61), the ARGUS will display a green "OK" in the ARGUS status (see page 28) otherwise it will show a red "FAIL".

<Info>   Display the VDSL connection parameters.

<Stop>   Clear down the VDSL connection.

Continuation on next page

VDSL line		
Param.:	d/n	u/f
Bitrate	79572	17316
Att.bitr.	113793	15233
OutPower	+12.0	-26.5
FEC	209	3146
CRC	0	54
Rated:	OK	OK

| Parameter | Trace | Graph |

Display of the VDSL connection parameters in brief:
- d/n: downstream/near
- u/f: upstream/far

Scroll through the connection parameters.

<Trace> Display the trace data, see page 63.

<Graph> Display the graphs, see page 67.

Display the connection parameters in long form for both downstream (d) and

VDSL parameters		
Actual bitrate		d|u
[kb/s]	79572	17316
Attainable bitrate		d|u
[kb/s]	113793	16410
Relative capacity		d|u
[%]	69.9	105.5

| Statistic | Reset | |

upstream (u), see table on page 68.

n/a   not available

n/u   not used

n/r   not received

Scroll through the parameters

<Statistic> Open the Ethernet statistics, see page 81

Reset (zero) the FEC and CRC error counters

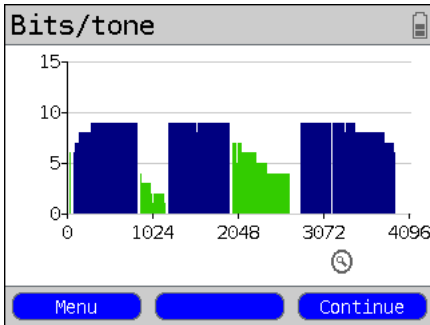| VDSL line		
Param.:	d/n	u/f
Bitrate	79572	17316
Att.bitr.	113793	15233
OutPower	+12.0	-26.5
FEC	209	3146
CRC	0	54
Rated:	OK	OK

| Parameter | Trace | Graph |

Reset the error counters (FEC and CRC).
CAUTION: Once showtime has been reached, the ARGUS will automatically reset the error counters.

Display of the bit distribution i.e. transported bits per tone (channel). The bands for upstream and downstream change depending on the VDSL profile (green: upstream, blue: down-stream, in this example, US0, DS1, US1, DS2, US2, DS3)
y-axis: bits
x-axis: tones (channels)
Based on the bit distribution, it is possible to detect line disturbances (e.g. through HDB3, HDSL, RF etc.)

The ARGUS will return to the previous display

<Continue> Scroll to the next graphic
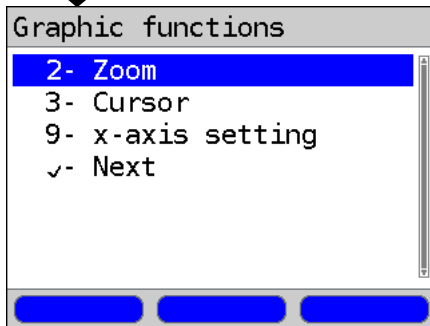
Graphic functions:
The graphic functions like Zoom, Cursor and Setting of the x-axis allow detailed analysis of the graphs. These, as well as other result graphs (e.g. SNR/tone, QLN/tone and HLOG/tone) can be opened and used in the same manner as with ADSL (see page 42 et seq.).

The ARGUS determines the following VDSL connection parameters:

VDSL connection parameters:	
Actual bitrate	The actual usable bitrate in kbit/s.
Attainable bitrate	This is the theoretically attainable bitrate in kbit/s.
Relative capacity	Utilization of the line as a percentage.
SNR margin	SIgnal-to-noise ratio in dB in the bands used.The SNR margin is a measure of how much additional noise the transmission can withstand and still achieve a BER (Bit Error Rate) of 10^{-7}. This value is the amount of reserve that a line has to deal with interference. Unused bands are marked as n/u (not used).
Loop attenuation	The line's attenuation in dB over its entire length and bandwidth. Certain types of access are not suitable where the line attenuation is particularly high. When considering the attenuation values to determine the recommended access types it is better to use the dB values in the Hlog graphs at a 1 MHz cursor setting. Unused bands are marked as n/u (not used).
Signal attenuation	Signal attenuation in dB in the relevant bands. Unused bands are marked as n/u (not used).
Output power	Output power in dBm referenced to 1 mW.
Interleave delay	This is the delay (in ms) caused by interleaving the data blocks.
Impulse noise prot.	The Impulse Noise Protection (INP) is an indicator of the quality of the protective mechanism as far as impulse noise is concerned. The number of DMT symbols, which can be completely distorted in succession, without an error occurring on the higher layers.
FEC	Forward Error Correction The number of transmission errors corrected using the cell checkbytes. f (far): Errors that the DSLAM has detected and informed the ARGUS. n (near): Errors which were detected by the ARGUS in the blocks it received.

CRC	Cyclic Redundancy Check
	The superframe checksum sent from the opposing end does not match the one calculated locally.
	Possible cause: Fault on the line.
	f (far): Errors that the DSLAM has detected and informed the ARGUS.
	n (near): Errors which were detected by the ARGUS in the blocks it received.
Reset	Shows how often the error counters have been reset by the user with the `<Reset>` softkey.
Resync:	Number of times that the ARGUS has been resynchronized.
Showtime no sync:	Shows how often the connection has reached the status "Showtime" without establishing a permanent, stable connection.
Elec.length@1MHz	Displays the electrical length at a frequency of 1 MHz in dB. R: VTU-R-side C: VTU-C-side
Vendor far:	The manufacturer of the VTU-C-side, see page 217 for more information.
Version:	Vendor Specific Information, generally shows the version of the software running at the VTU-C (DSLAM) end.
Vendor near:	Manufacturer of the ARGUS chipset (VTU-R), see page 217 for more information.
Version:	Vendor Specific Information, shows the software version of the ARGUS.

System information regarding the transmission to the remote end is VDSL.

⚠ If the ARGUS is on a VDSL access and is synchronized with a DSLAM in accordance with ITU-T G.997.1, it will register with the DSLAM's control system. The data in the DSLAM will be displayed as it is for ADSL, see page 49.

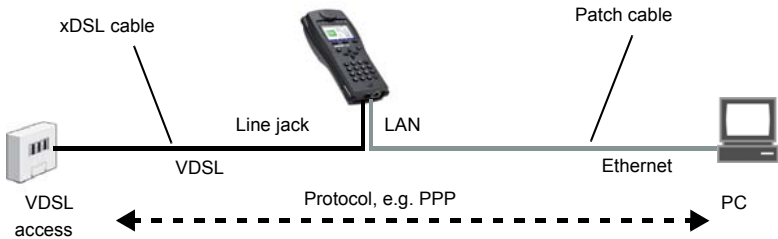**Clear down the VDSL connection and save the results**

The process of clearing down a VDSL connection and saving the results is performed in the same manner as in the case of an ADSL connection, see page 50.

Displaying the saved test reports

The saved VDSL test results are displayed in the same manner as those for an ADSL access, see page 52.

8.4 The ARGUS in the VTU-R Bridge Access Mode

Connect the ARGUS to the VDSL access using the xDSL cable and to the PC with a patch cable. In Bridge mode, the ARGUS acts like an VDSL modem, i.e. the ARGUS passively passes all packets from the Ethernet side to the VDSL access (and vice versa). In this case, the PC is responsible for setting up the connection.

Bridge/Router settings, see page 33

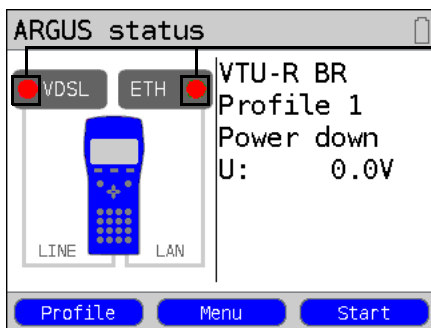| Setting			
Bridge/Router	Ethernet	Autonegotiation On / Off, see page 79.	
	IPv4	- IP mode: - Local (own) IP address - IP netmask - DHCP server:	Static IP *DHCP server* Start / end address Domain Reserve time

Setting the access mode to VTU-R Bridge:

ARGUS - Main Menu

or

 and in the Status screen.

Access mode:
VTU-R
VTU-R bridge
VTU-R router

ARGUS status

VDSL ETH

VTU-R BR
Profile 1
Power down
U: 0.0V

LINE   LAN

Profile | Menu | Start

**The test is not yet started:
red LED in the display**

Key to the LED symbolized in the display:

Red LED — no test started

Yellow LED — test started

Green LED — A connection has been setup

Display:
- Access mode
- Default (preset) profile, see page 30
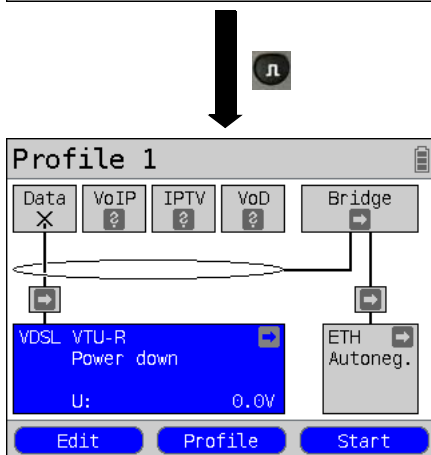- Current State
- Interface's DC voltage

The 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

Profile 1

Data ✕ | VoIP | IPTV | VoD | Bridge →

VDSL VTU-R   Power down
U: 0.0V

ETH Autoneg.

Edit | Profile | Start

Setting up a VDSL connection

Using the cursor keys, select Bridge, see page 83.

Display shows (Layer 1 box):
- Access
- Access mode
- Current State
- Interface's DC voltage

Profile 1

Data ✕ | VoIP | IPTV | VoD | Bridge →

VDSL VTU-R Profi. 17a ✓
  kb/s: 80000/ 15996
  CRC: 0/   0
  U: 0.0V

ETH Autoneg.

Edit | | Start

Setting up a VDSL Bridge

The VDSL connection has been setup (green check mark in the Layer 1 box).

<Edit> Setting the Bridge/Router parameters.

The bridge can also be activated directly. If Layer 1 has not yet been setup, it will be setup automatically.

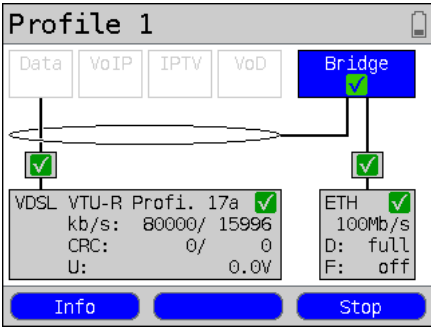**<Stop>**   Deactivate Bridge mode.

<Info>   This displays the Bridge mode activity.

Display the connection parameters.
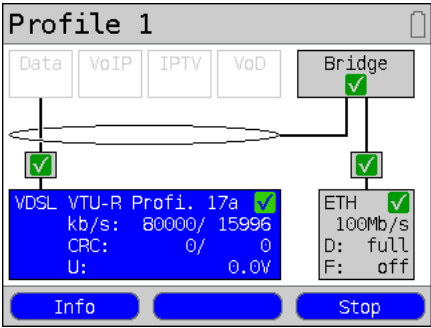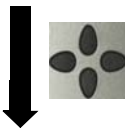
Switch to Layer 1 box and other elements, for details on the operation, see page 82.

<Info>
or   Display the VDSL connection parameters, see page 66.

<Stop>   Clear down the VDSL connection and automatically deactivate the bridge.

8.5 The ARGUS in the VTU-R Router Access Mode

Connect the ARGUS to the VDSL access using the xDSL cable and to the PC with a patch cable. In Router mode, the ARGUS replaces not only the modem but also the router. In this case, several PCs (connected via a hub/switch) can access the connection via a network connection. The network IP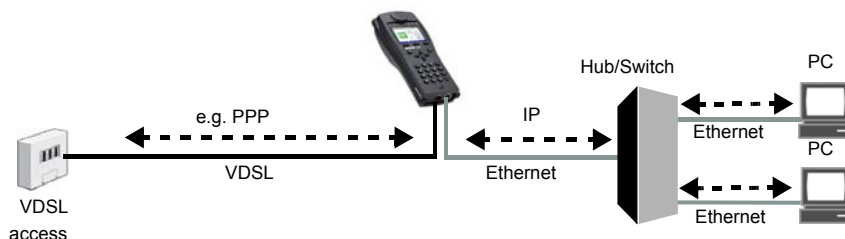 addresses can either be assigned statically or the ARGUS can serve as a DHCP server and assign IP addresses to the connected PCs.

⚠ **The ARGUS does not have a firewall!**

Bridge/Router settings, see page 33.

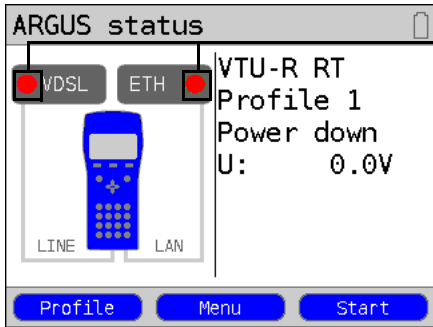| Setting			
Bridge/Router	**Ethernet**	Autonegotiation On / Off, see page 79.	
	IPv4	- IP mode:	Static IP ***DHCP server***
		- Local (own) IP address - IP netmask - DHCP server:	Start / end address Domain Reserve time
	Router	- NAT On / Off - SIP port	

VDSL settings, see page 61:

Setting			
Access parameters	**Phys. parameters**	VDSL	Rated value FW (Firmware) Carrier set

Setting the access mode to VTU-R Router:

| Access | ARGUS - Main Menu |

⬇ ✔️

| VDSL | or |

⬇ ✔️   🔆 and 🔘 in Status screen.

| VTU-R Router |

⬇ ✔️

The test is not yet started:
red LED in display

Key to the LED symbolized in the display:

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

Display:
- Access mode
- Default Profile (Profile 1)
- Current State
- Interface's DC voltage

⬇ 🔲

The 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

Display shows (Layer 1 box):
- Access mode
- Current State
- Interface's DC voltage

 Use the cursor keys to select Router, see page 83.

<Profile> Open profile see page 36

Setting up a VDSL connection

Profile 1

| Data | VoIP | IPTV | VoD | Router |

VDSL VTU-R Profi. 17a ✓
    kb/s: 80000/ 7824
    CRC: 0/   0
    U: 0.0V

ETH
Autoneg.

| Edit | | Start |

Setup the VDSL Router.
The VDSL connection is active!

Displays and operation like in Bridge
mode, see page 71.

Router selected.

The router can also be activated directly. If Layer 1 has not yet been setup, it will be setup automatically.

<Edit>   Setting the Bridge/Router parameters, see page 33.

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:
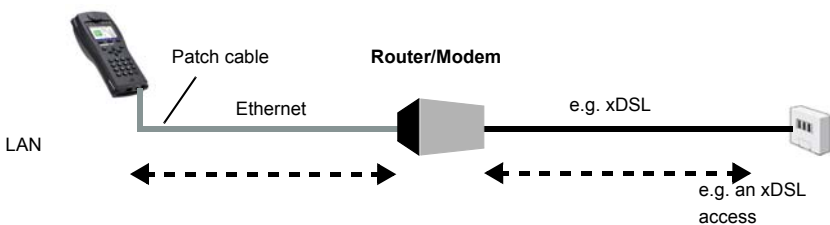
Connection to a PPTP Router/Modem:
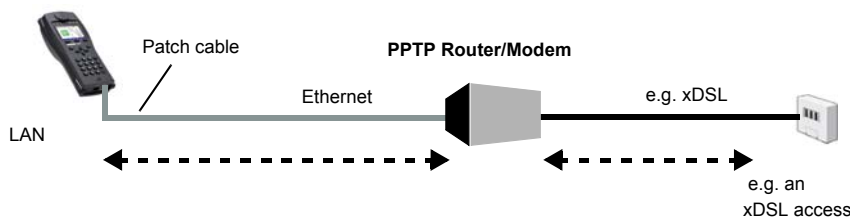
Connection to a PC via IP
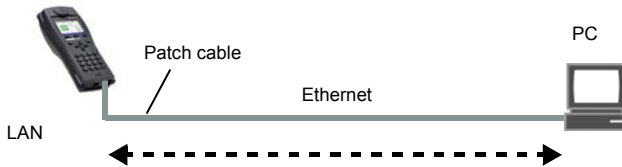
Connection to an IP network
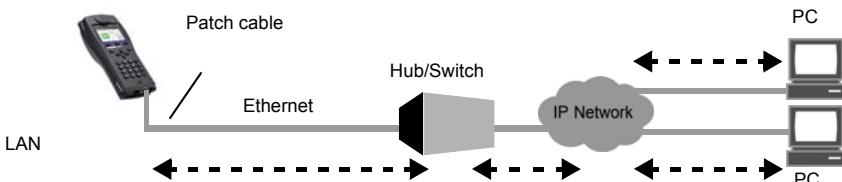
Settings in the profile:

Access parameters	
Ethernet	Autonegotiation On / Off

9.1 Setting the Ethernet Interface

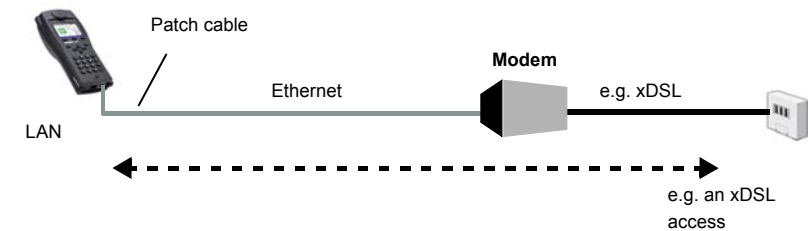The Ethernet interface settings are made in the same manner as they are for an ADSL access, see page 28.

Note: Starting functions with the numeric keys / key combinations
The ARGUS keypad can be used to call up or start the main functions and/or tests directly. An overview of the possible key combinations can be found on page 104.

9.2 Ethernet Settings

The Ethernet settings are changed in the same way as those for an ADSL access, s. page 29.

Setting	Explanation
Access parameters:	
Phys. parameters:	
Ethernet:	
`Autonego-` `tiation`	Switch on or off If autonegotiation is enabled, a network card can independently determine the correct transmission speed and duplex setting for the network port to which it is connected and can then configure itself accordingly. In the case of Ethernet, auto-negotiation is based on Layer 1 of the OSI Model (in accordance with the IEEE 802.3u standard). Default setting: ***on*** For information on the **off** setting, see the next section page 79.
MAC address:	
	Display and selection of the MAC addresses. The first two MAC addresses cannot be changed manually. 1. If the default MAC address is selected, the ARGUS will use its own MAC address. Default setting: ***Default MAC address*** 2. If Dynamic MAC Address is selected, a different MAC address will be used for each synchronization. 3. A third MAC address can be entered: Mark a line and then press `<Edit>`.

	`<Edit>` Edit the MAC address for the entry.
	   Enter the address in hexadecimal from the keypad and the softkeys `<A..F>` (e.g. to enter a "C" press the softkey three times or for an "F" six times; conclude by pressing `<OK>` to confirm your entry). Group MAC addresses cannot be used.
	   Default setting: ***00:00:00:00:00:00***

	✓ Use the address. The new address is only saved temporarily and will not be available when the ARGUS is switched on again.
	One after the other ⚙ and ① Displays the ARGUS MAC addresses: Line, LAN, see also page 106 f.

For information on other access parameters, see chapter 10 Virtual Lines (VL) page 82.

Autonegotiation / Ethernet Link Parameter

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

Setting: Autonegotiation "on"

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

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

Manual setting of the Ethernet link parameter

Setting: Autonegotiation "off"

When "autonegotiation" is deactivated, the speed, duplex mode, flow control (flow control = "Pause" mode) are set in the profile (see page 78).

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

⚠️ **One-sided Autonegotiation**

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

9.3 Setup an Ethernet connection
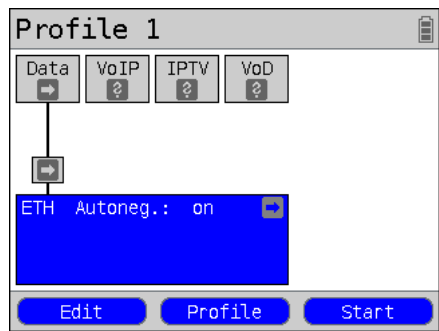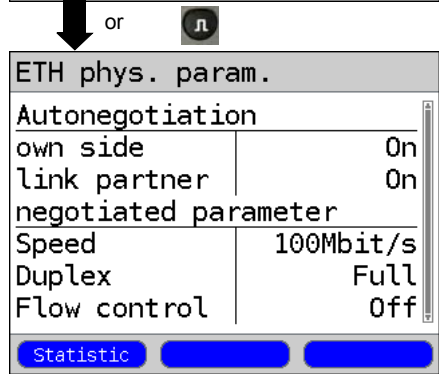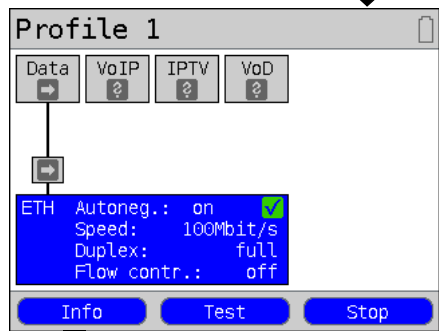
ARGUS - Status screen

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

Profile 1

Data ➡ VoIP ? IPTV ? VoD ?

➡

ETH Autoneg.: on ➡

| Edit | Profile | Start |

The 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

Setup an Ethernet connection

<Info>   Displays the Ethernet connection parameters

<Test>   Display the tests possible, see page 104

<Start>   Activate Ethernet

<Stop>   Disable the Ethernet connection

Profile 1

Data ➡ VoIP ? IPTV ? VoD ?

➡

ETH Autoneg.: on ✓
      Speed: 100Mbit/s
      Duplex: full
      Flow contr.: off

| Info | Test | Stop |

or [п]

ETH phys. param.

Autonegotiation	
own side	On
link partner	On
negotiated parameter	
Speed	100Mbit/s
Duplex	Full
Flow control	Off

| Statistic | | |

Display:

- Autonegotiation setting

- Autonegotiation on the remote end

- Negotiated speed

- Type of duplex mode

- Flow control setting

<Statistic>   Open Ethernet statistics

Continuation on next page

```
Statistics
Ethernet            Rx │ Tx
Frames         12         0
Bytes        1142         0
Errors          0         0

Collision
                          0
```

Statistics display:

- Ethernet frames received (Rx) and sent (Tx)

- Bytes received (Rx) and sent (Tx)

- Number of errors on the receiving (Rx) and sending (Tx) sides

- Number of collisions

Clear down the Ethernet connection and save the results

The process of clearing down an Ethernet connection and saving the results is performed in the same manner as in the case of an ADSL connection, see page 50.

10 Virtual Lines (VL)

Virtual Lines (VL) are used to gather the settings for Layer 2 and Layer 3 into a profile - a 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 (DSL, Eth) 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:

Profile name

Services, see page 102

Virtual Lines

Layer 1

Current assignment of the soft-keys, see page 106

Router/Bridge (xTU-R Bridge and xTU-R Router only)

Virtual Line for Bridge/Router, settings, see page 33
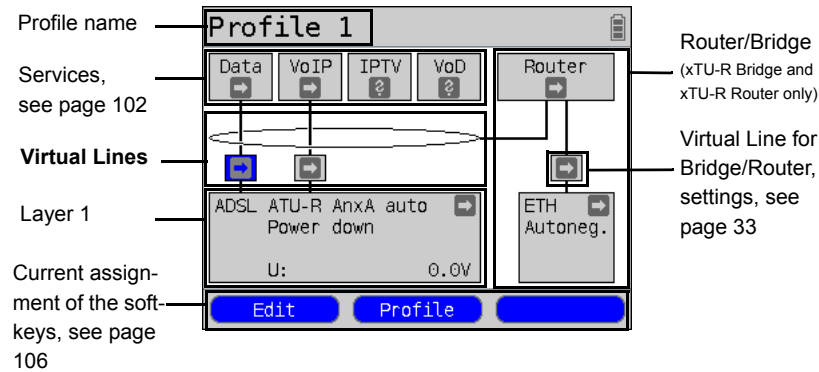
The Status screen is organized in three levels, which can be accessed individually using the ARGUS cursor keys.
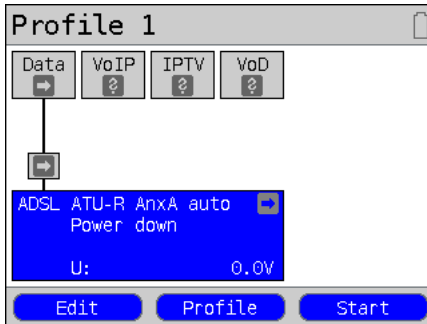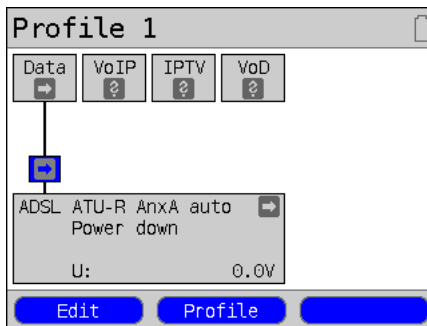
The Status screen will described in greater detail using three displays as examples.

Profile 1

| Data ➡ | VoIP ❓ | IPTV ❓ | VoD ❓ |

ADSL ATU-R AnxA auto ➡
Power down

U: 0.0V

| Edit | Profile | Start |

Layer 1: Physical Layer (see page 26)

<Edit>   Physical layer - configuration

<Profile>   Configure profile

<Start>   Setup the physical layer for the selected access.

Cursor at top

Profile 1

| Data ➡ | VoIP ❓ | IPTV ❓ | VoD ❓ |

ADSL ATU-R AnxA auto ➡
Power down

U: 0.0V

| Edit | Profile | |

Layer 2: Virtual Lines

The following configuration options are displayed:
- Protocol (IP, PPP, PPTP)
- ATM, see page 93
- VLAN, see page 94
- PPP (PPP profile)
- PPTP, see page 95
- IP version (IPv4, IPv6, Dual)
- IPv4, see page 95
- Data log (for this VL)
- Profile name, see page 97

<Edit>   Virtual Line - configuration, see page 87

<Profile>   Configure profile

Cursor at top

Profile 1

| Data ➡ | VoIP ❓ | IPTV ❓ | VoD ❓ |

ADSL ATU-R AnxA auto ➡
Power down

U: 0.0V
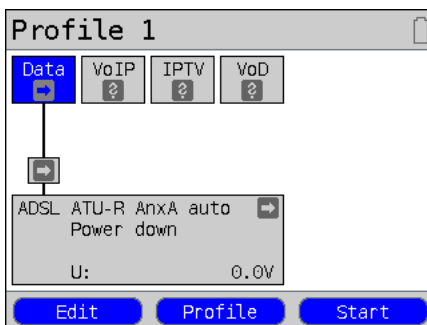
| Edit | Profile | Start |

Layer 3: Services (see page 102)

<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.

Depending on the status of the physical layer, the Virtual Line or the service, the ARGUS displays different symbols in the graphic boxes.

There is still no Virtual Line assigned to this service.

This service, Virtual Line or physical layer is idle.

This service is not available (Bridge mode only).

Preparing to activate the physical layer, the Virtual Line or the service.

The physical layer, Virtual Line or service is currently being activated.

The physical layer, Virtual Line or service is being deactivated due to an unexpected event.

The deactivation is being performed.

The access has been successfully synchronized (physical layer) or a Virtual Line or service has been successfully activated without errors.

A test is currently running in this service.

An error has occurred here. To continue with this Virtual Line and service, press `<Reset>`.

10.2 Virtual Line Profile (VL Profile)

Explanations of the various types of profile:

Profile (1 - 10), see page 30:

- Under the access parameters, you will find the Layer 1 settings (Phys. parameters, MAC address) and the assignments for the Data, VoIP, IPTV and VoD services.

- In addition to the access parameters, these profiles also hold the settings for the Bridge/Router and the test parameters.

- Each profile can be assigned an individual profile name.

Virtual Line profile (Virtual Lines 1 - 10)

- These hold the settings for Layers 2 and 3.

- Virtual Line profiles are assigned to services.

- Each Virtual Line can be assigned to multiple services.

- PPP profiles can be assigned to the Virtual Line profiles.

PPP profile (1 - 10)

- These profiles hold all the data relevant for dialling.

- PPP profile are assigned to the Virtual Line profiles.

- Each PPP profile can be assigned to multiple Virtual Line profiles.

The relationship between the types of profiles
After all of the settings have been reset (see page 207), profiles (1-10) each have only one
Virtual Line profile (1-10) that is assigned to the Data service. Each Virtual Line profile (1-
10) is assigned a PPP profile.
In this default state, none of the other services (VoIP, IPTV or VoD) are assigned a Virtual
Line profile or PPP profile.
The assignment of other Virtual Line profiles and PPP profiles to services will be described
beginning on page 87.

Default configuration:
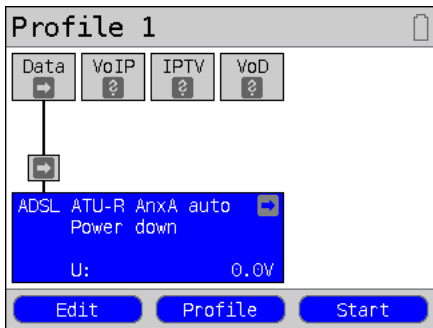
Profile 1

Data service	=>	VL profile 1	=>	PPP Profile 1
VoIP service		...		...
IPTV service		...		...
VoD service		....		...
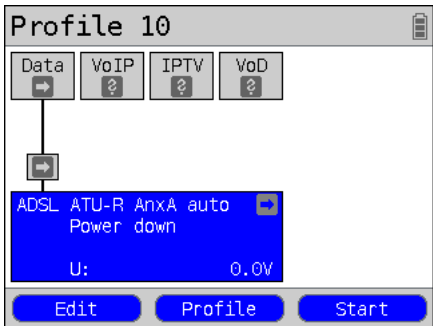
Profile 10

Data service	=>	VL Profile 10	=>	PPP Profile 10
VoIP service		...		...
IPTV service		...		...
VoD service		....		...

10.3 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.

10.3.1 Starting a service
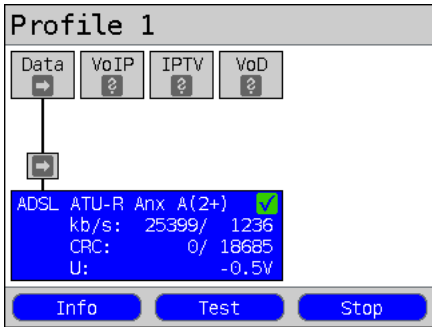
The ADSL connection is active.
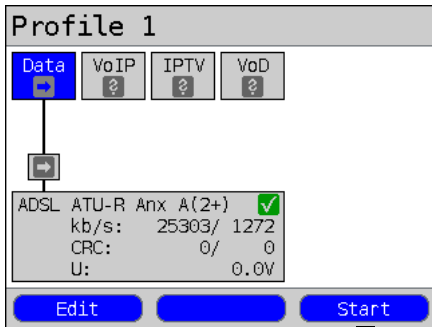
Using the cursor keys, move from the Layer 1 box over the Virtual Line to the "Data" service.

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

<Start> Start service
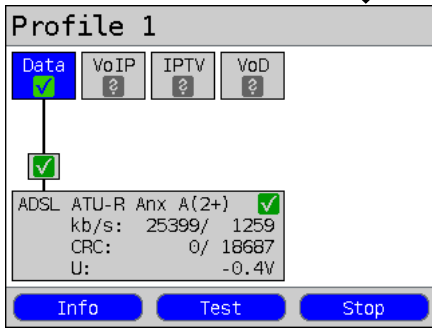
Now the physical layer (ADSL), the Virtual Line, and the Data service are all active. This is indicated by the green "check marks".

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

<Stop> The Data service will be stopped.

For an explanation of the services, see page 102.

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 120).

10.3.2 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.
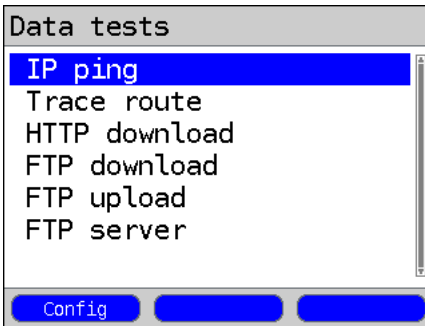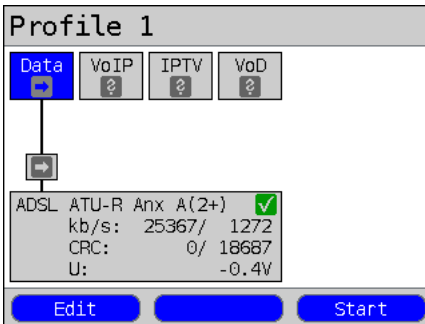

In order to configure a Virtual Line (which is connected the Data service in this example) for use with other services, its current service must first be stopped.
The physical layer remains active.
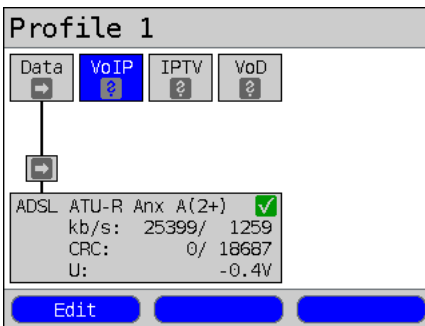
Use the cursor keys to select the VoIP service.

Continuation on next page

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

Service VoIP

Virtual line
 VoIP account
 VoIP QoS
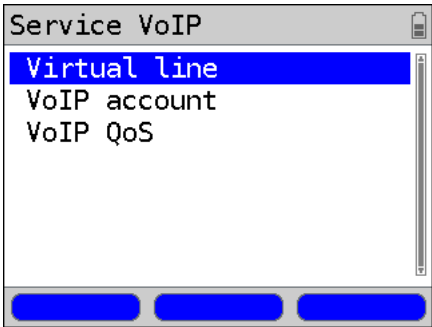
Select "Virtual Line".
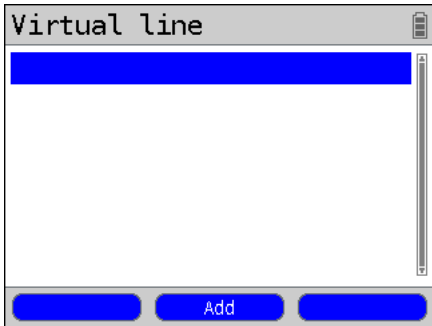
Since the VoIP service has not yet been assigned a Virtual Line profile, the list is first empty.

Virtual line

Add

<Add>   Open the Virtual Line
             selection.

Virt. line sel.

Virt.profile 1
 Virt.profile 2
 Virt.profile 3
 Virt.profile 4
 Virt.profile 5
 Virt.profile 6
 Virt.profile 7
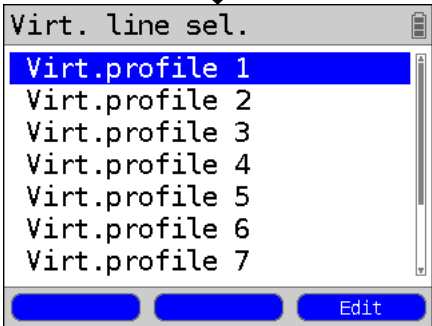
Edit

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> The possible settings are described on page 93 et seq.

Select the Virtual Line profile for the service.
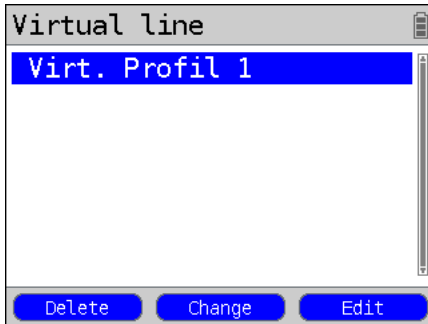
The selected Virtual Line profile will be displayed.

Virtual line

Virt. Profil 1

Delete	Change	Edit

<Delete> The selected Virtual Line will be deleted.

<Change> The selected Virtual Line will be changed.

<Edit> The selected Virtual Line will be opened for editing, see page 93.

✓ Assigning the Virtual Line profile to the service, see page 91.

Virtual line

Protocol
ATM
VLAN
PPP
PPTP
IP version
IPv4
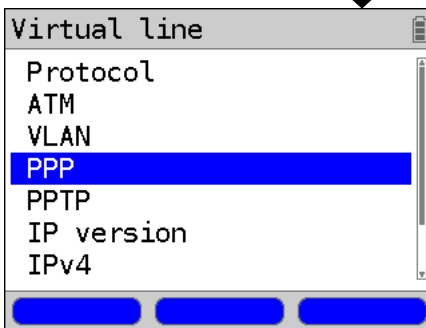
e.g. select PPP

The possible settings are described on page 93 et seq.
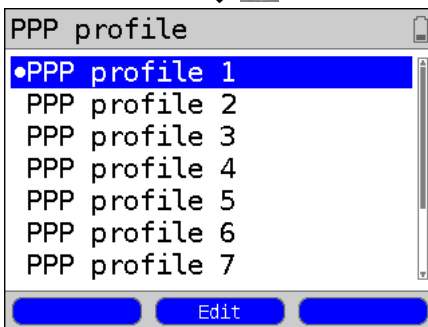
Open the PPP profile list

PPP profile

●PPP profile 1
 PPP profile 2
 PPP profile 3
 PPP profile 4
 PPP profile 5
 PPP profile 6
 PPP profile 7

	Edit	

e.g. select PPP profile 1

Up to ten PPP profiles can be configured.

<Edit> Open the selected PPP profile for editing, see page 93.

```
┌─────────────────────────────────┐
│ PPP                          ▤  │
│ ┌─────────────────────────────┐ │
│ │ User name                   │▲│
│ │ Password                    │ │
│ │ Set IP                      │ │
│ │ Activation delay            │ │
│ │ Profile name                │ │
│ │                             │ │
│ │                             │▼│
│ ├─────────────────────────────┤ │
│ └──────────┬─────────┬────────┘ │
└─────────────────────────────────┘
```

The possible settings are described on page 93 et seq.

Return the previous menu and to selection of the Virtual Line profile.

⬇ 3x ✖

```
┌─────────────────────────────────┐
│ Virtual line                 ▤  │
│ ┌─────────────────────────────┐ │
│ │ Virt. Profil 1              │▲│
│ │                             │ │
│ │                             │ │
│ │                             │ │
│ │                             │ │
│ │                             │ │
│ │                             │▼│
│ ├─────────────────────────────┤ │
│ │ Delete  │ Change  │ Edit    │ │
│ └─────────┴─────────┴─────────┘ │
└─────────────────────────────────┘
```

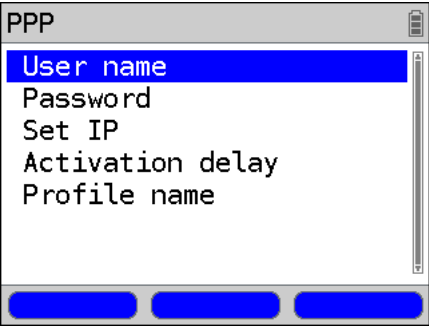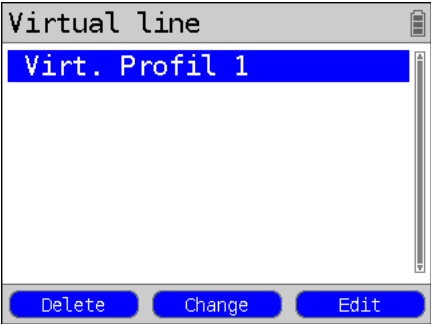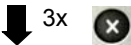⚠ After confirming your selection, the selected profile must be confirmed once more.

<Delete> The selected Virtual Line profile will be deleted.

<Change> The selected Virtual Line profile will be changed.

✔ The ARGUS will use the selected profile.

⬇ ✔

```
┌─────────────────────────────────┐
│ Service VoIP                 ▤  │
│ ┌─────────────────────────────┐ │
│ │ Virtual line                │▲│
│ │ VoIP account                │ │
│ │ VoIP QoS                    │ │
│ │                             │ │
│ │                             │ │
│ │                             │ │
│ │                             │▼│
│ ├─────────────────────────────┤ │
│ └──────────┬─────────┬────────┘ │
└─────────────────────────────────┘
```
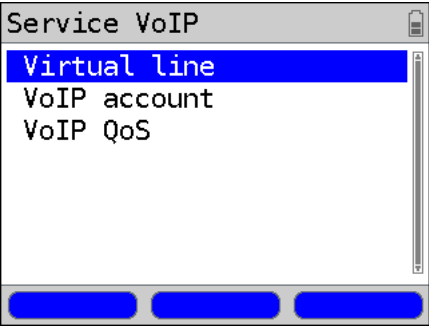
The ARGUS will open either the Status screen or the Settings menu (depending on whether the profile was opened from the Main Menu or the Status screen).

Continuation on next page ⬇ ✖
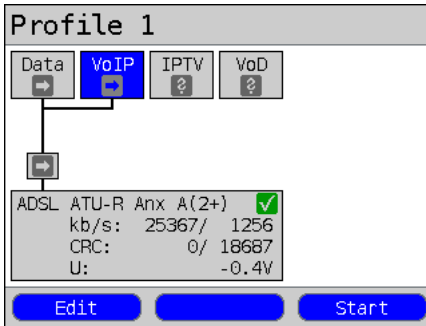
The "Data" and "VoIP" services are now connected to the physical layer (ADSL access) by single Virtual Line.

<Start> Start VoIP service
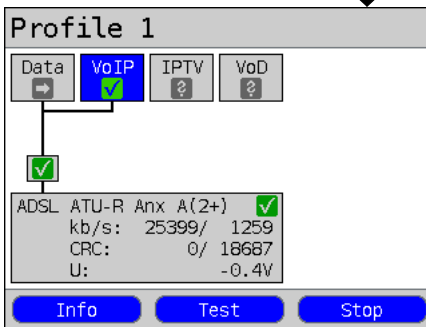
The "VoIP" service is now active.
It is now possible to perform various tests on the VoIP service.

In the next step, it is possible to activate another service.

Select "Data" with the cursor keys and press **<start>** to activate the service.
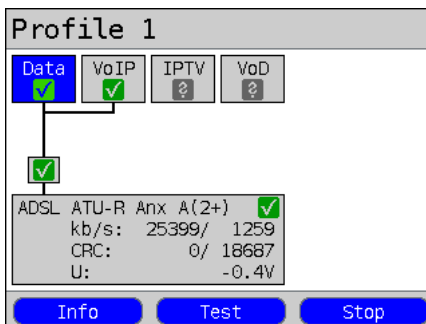
The "Data" and "VoIP" services are active. It is now possible to perform various tests on both the "Data" and the "VoIP" services.

The displays and operation of IPTV and VoD (Video on Demand) services are like those of VoIP.

Other examples of different Virtual Line assignments:

Example 1:
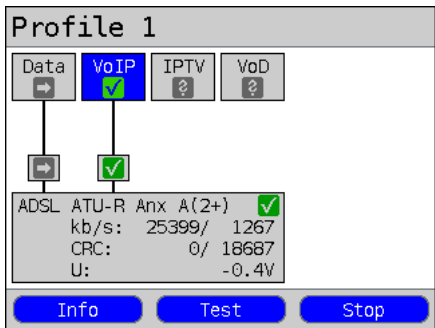
One Virtual Line is connected to the Data service and another to the VoIP service. The Virtual Line for VoIP can use different protocol data from that of the Virtual Line for Data.

Example 2:
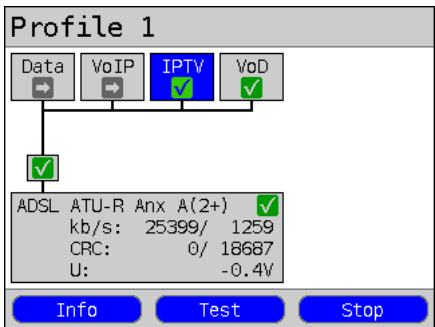
A Virtual Line was configured for the Data, VoIP, IPTV and VoD services.
In this example, the IPTV and VoD services are active.

In the case of the IPTV service it is possible to setup up to four Virtual Lines.
The ARGUS will however display these together as a single Virtual Line.
For more details, see the chapter on IPTV (page 173).

Example 3:
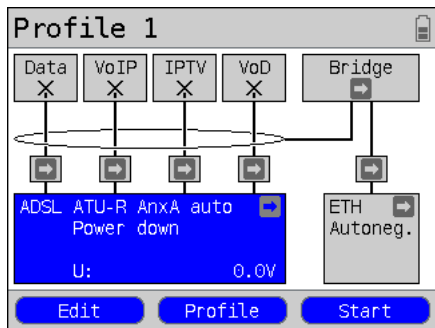
In this example, each service has been assigned a Virtual Line.
Since the ARGUS is in Bridge mode, these services cannot be performed.

10.4 Virtual Line Settings

Setting	Explanation
Virtual Profile 1 to 10	
`Protocol`	Selection of the transfer protocol that the ARGUS should use for the test (e.g. for an IP test). Default setting: *PPP*

Protocol	ATM:	Interfaces:		
	ATM with ETH	**ADSL**	**VDSL**	**ETH**
IP	Yes	EoA	IP	
IP	No	IPoA		
PPP	Yes	PPPoE	PPPoE	
PPP	No	PPPoA		
PPTP	-	-	-	PPTP

The settings - regardless of whether the "ATM with Ethernet" or "ATM without Ethernet" protocol is used - will be handled under the heading ATM.	
`ATM:`	Settings for Asynchronous Transfer Mode

`VPI/VCI`	VPI: Enter Virtual Path Identifier
	VCI: Enter Virtual Channel Identifier
	          Range: VPI: 0 to 127, VCI: 32 to 255
	          Default setting: *VPI: 1* and *VCI: 32*

`Encapsulation`	Selection of the encapsulation of the packets to be sent: LLC or VC-MUX. Default setting: *LLC*
`Ethernet`	Sets whether Ethernet over ATM will be used or not, see table above. Default setting: *Yes*

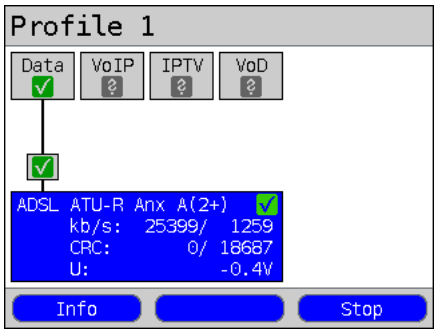| VLAN:	VLAN (Virtual Local Area Network)	
VLAN	Use VLAN:	Specifies whether or not VLAN should be used: Default setting: *No*
	ID:	Identifier for the VLAN to which the frame belongs. Every VLAN is assigned a unique number, the VLAN ID. A device, which belongs to the VLAN with the ID = 1, can communicate with every other device in the same VLAN, but not with a device in other VLANs (i.e. one with a different ID such as 2). Range: from 0 to 4095 Default setting: *0*
	Priority:	User - priority information: An eight-level (3 bits) priority can be assigned to each frame. In this manner, it is possible e.g. to give priority to forwarding voice data (e.g. in the case of VoIP), while HTTP data will be handled as a lower priority. Range: 0 to 7 Default setting: *0*
PPP Profile:	PPP settings (Point-to-Point-Protocol) **<Edit>** Open PPP profile for editing	
User name	User name: ▮ [ ] [Delete] [ab>AB]	Entry of the user name assigned (by the network operator): Use the keypad to enter the user name. When the right softkey is pressed it assumes a different meaning and thus influences the entries made from the keypad (uppercase or lowercase letters, or digits).
Password	Entry of the password assigned by the network operator, for more information, see User Name. While entering the password the characters will remain visible until the password is confirmed. Afterwards, the characters of the password will be shown masked with "*".	

`Set the IP`	If "Yes", the IP address entered as IP / own IP address (see below) will be used for the connection. Default setting: *No*
`Activation delay`	After setting up the PPP connection, the ARGUS will first wait until the period specified in the "activation delay" has elapsed before beginning a test. Range: 2 to 10 seconds Default setting: *2*
`Profile name`	Enter the name of the PPP profile
`PPTP:`	PPTP settings (Point-to-Point-Tunneling Protocol)
	Local server IP address Range 0.0.0.0. to 255.255.255.255 Default setting: *0.0.0.0*
`IP version:`	Internet Protocol version
	Setting that specifies which IP version should be used. IPv4: Internet Protocol version 4, in accordance with RFC 791 IPv6 Internet Protocol version 6, in accordance with RFC 2460 Dual: If IPv6 is available, it will be used by default, if not the ARGUS will switch to IPv4. Default setting: *IPv4*
`IPv4:`	Internet Protocol version 4 - settings
`IP mode`	Setting the assignment of the IP addresses Static IP: Static IP addresses DHCP client: IP address assigned by the server (remote end) DHCP server: IP address assigned by the ARGUS DHCP auto: ARGUS checks whether there is a DHCP server in the network. If yes, the IP address will be assigned by the server. Otherwise, the ARGUS will assign the address. Default setting: *DHCP Client*
`Local IP Address`	Own local IP address of the ARGUS Range: 0.0.0.0 to 255.255.255.255 Default setting: *0.0.0.0* (see RFC 3330 regarding assignment)

`IP netmask`	IP netmask Range: 0.0.0.0 to 255.255.255.255 Default setting: *255.255.255.0* (see RFC 3330 regarding assignment)
`Gateway IP`	Gateway IP address Range: 0.0.0.0 to 255.255.255.255 Default setting: *0.0.0.0* (see RFC 3330 regarding assignment)
`DNS server`	DNS server 1 DNS server 2 Entry of the DNS server's IP address (DNS = Domain Name System) Range: 0.0.0.0 to 255.255.255.255 Default setting: *0.0.0.0* (see RFC 3330 regarding assignment)
`DHCP client`	DHCP Timeout (setting of how long to wait for the IP address): Range: 1 to 9999 seconds Default setting: *20*
	DHCP Vendor ID: - Format: Selection of the format: ASCII or hexadecimal - ASCII data: Enter the DHCP Vendor ID in ASCII format Default setting: *ARGUS*, for more information see "User name" on page 94 - HEX data: Enter the DHCP Vendor ID in hexadecimal format; for more information see "MAC address" on page 78
	DHCP Vendor Info: - Format: Selection of the format: ASCII or hexadecimal - ASCII data: Enter the DHCP Vendor Info in ASCII format Default setting: *ARGUS*, for more information see "User name" on page 94 - HEX data: Enter the DHCP Vendor Info in hexadecimal format; for more information see "MAC address" on page 78
	DHCP User Class Information - Format: Selection of the format: ASCII or hexadecimal - ASCII data: Enter the DHCP User Class I. in ASCII format Default setting: *ARGUS*, for more information see "User name" on page 94 - HEX data: Enter the DHCP User Class Information in hexadecimal format; for more information see "MAC address" on page 78

	DHCP User-defined Option (creating a user-specific DHCP option) - Option number Range: 0 to 255 Default setting: **255 = off** - Format: Selection of the format: ASCII or hexadecimal - ASCII data: Enter the DHCP Userdef. Option in ASCII format Default setting: **ARGUS**, for more information see "User name" on page 94 - HX data: Enter the DHCP User-defined Option in hexadecimal format, for more information see "MAC address" on page 78
`DHCP server`	Options for the DHCP server: - Start and End IP addresses Range: 0.0.0.0 to 255.255.255.255 Default setting: (see RFC 3330 regarding assignment) Start: **192.168.10.30** End: **192.168.10.40** - Name of the domain, for more information see "User name" on page 94 - Reserve time of the IP addresses Range: 1 to 99999 hours Default setting: **240**
`Data Log`	Data log on or off This setting must be "ON" in order to send a trace file to a PC see page 50. After a Virtual Line has been terminated by the associated service or the physical layer, the ARGUS will enquire whether the trace file should be sent to the PC. In order to send the trace file, the Trace/remote (see page 202) function must be active and the ARGUS must be connected to a PC using the mini-USB. As an example, if data Log is activated for Virtual Line 1, only Virtual Line 1 will be recorded. If a Virtual Line is configured for multiple services and data log is activated, all of this Virtual Line's data will be recorded. Default setting: **Off**
`Profile name`	Enter the name of the VL profile.

10.5 Display the Protocol Statistics

Depending on the access mode and protocol, the ARGUS will display the BRAS, IP, PPP, ATM or Ethernet statistics.
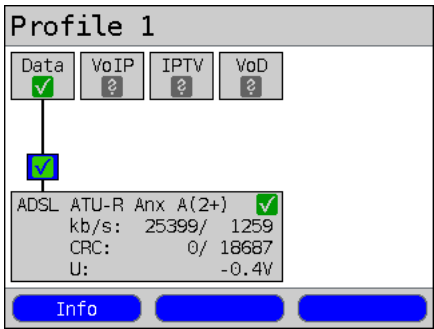
Profile 1 Data ✓ VoIP ❓ IPTV ❓ VoD ❓ ✓ ADSL ATU-R Anx A(2+) ✓ kb/s: 25399/ 1259 CRC: 0/ 18687 U: -0.4V Info ⎸ ⎸ Stop	The physical line, the Virtual Line and the Data service are active. **\<Info\>** Display DSL events **\<Stop\>** Deactivate physical layer, VL and data Using the cursor keys switch to the Virtual Line.
Profile 1 Data ✓ VoIP ❓ IPTV ❓ VoD ❓ ✓ ADSL ATU-R Anx A(2+) ✓ kb/s: 25399/ 1259 CRC: 0/ 18687 U: -0.4V Info ⎸ ⎸	One after the other and Displays the ARGUS MAC addresses: Line, LAN, see also page 106 f.
Virt. Profil 1 BRAS information AC name ⎸ linux-tests ⎸ erver2 Servicename ⎸ intec pppoe ⎸ server IPv4 ⎸ PPP ⎸	BRAS information: The ARGUS displays (for the PPP protocol only) the BRAS (Broadband Remote Access Server) information: - AC (Access Server): Name of the server - Service name: Name of the service **\<IPv4\>** Display the configuration assigned by the server.
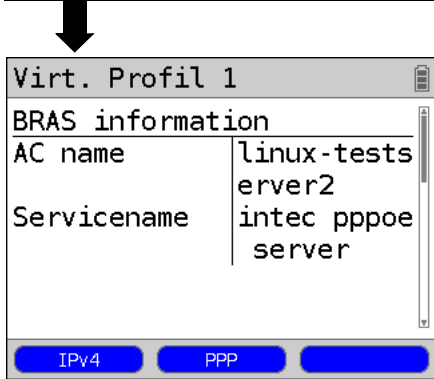
Continuation on next page

```
┌─────────────────────────────┐
│ Virt. Profil 1              │
├─────────────────────────────┤
│ PPP                 Rx│Tx   │
│ Packets         4│     3    │
│ Bytes          68│    54    │
│                             │
│                             │
│                             │
│                             │
├─────────────────────────────┤
│   IPv4        PPP           │
└─────────────────────────────┘
```

PPP information:
The ARGUS will display the number of PPP packets and bytes received (Rx) and sent (Tx).

```
┌─────────────────────────────┐
│ Virt. Profil 1              │
├─────────────────────────────┤
│ Ethernet            Rx│Tx   │
│ Frames         77│    77    │
│ Bytes        3585│  3180    │
│ Errors          0│     0    │
│                             │
│                             │
│                             │
├─────────────────────────────┤
│   IPv4        PPP           │
└─────────────────────────────┘
```

Ethernet:
The ARGUS will display the number of Ethernet frames received (Rx) and sent (Tx) and the number of bytes and errors.

<PPP> The **<PPP>** softkey is used to open a PPP trace in which the sequence of PPP messages will be shown.

```
┌─────────────────────────────┐
│ Virt.profile 1            ▤ │
├─────────────────────────────┤
│ < PADI sent                 │
│ < PADI sent                 │
│ > PADO rec.                 │
│ < PADR sent                 │
│ > PADS rec.                 │
│ < LCP conf. req.            │
│ > LCP conf. req.            │
├─────────────────────────────┤
│                      Time   │
└─────────────────────────────┘
```
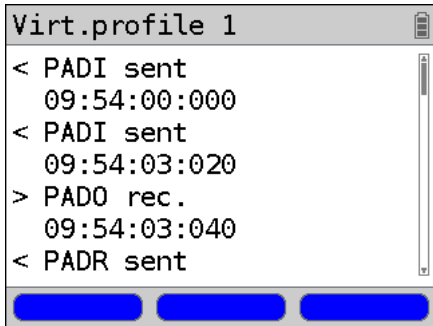
Display commands

< = command sent from the ARGUS

> = command sent from the DSLAM

<Time> The **<Time>** is used to tag (timestamp) the individual messages with times from the ARGUS system clock.

–   PADI:
    PPPoE Active Discovery Initiation

–   PADO:
    PPPoE Active Discovery Offer

–   PADR:
    PPPoE Active Discovery Request

–   PADS:
    PPPoE Active Discovery Session
    confirmation

–   PADT:
    PPPoE Active Discovery Termination

–   IPv6:
    IPv6 Control Protocol

–   LCP:
    Link Control Protocol

–   IPCP:
    Internet Protocol Control Protocol

–   PAP:
    Password Authentication Protocol

Table:

ack.   = acknowledge

auth.   = authentication

conf.   = configuration

nak.   = not acknowledge

prot.   = protocol

rec.   = received

rep.   = reply

req.   = request

rej.   = rejected

Depending on the IP version

```
┌─────────────────────────────┐
│ Virt. Profil 1           ▤  │
├─────────────────────────────┤
│ BRAS information         ▲  │
│ AC name      │linux-tests   │
│              │erver2        │
│ Servicename  │intec pppoe   │
│              │ server       │
│                             │
│                          ▼  │
├─────────────────────────────┤
│ ▭▭▭▭   ▭PPP▭   ▭IPv6▭        │
└─────────────────────────────┘
```

In the case of IPv6:

<IPv6> IPv6 information will be displayed.

<IPv4> IPv4 information will be displayed.

<IPv4>

```
┌─────────────────────────────┐
│ IPv6                     ▤  │
├─────────────────────────────┤
│ Global unicast address   ▲  │
│ 1│2001:5C0:1106:5500:       │
│   928:AF27:D3E7:61F3        │
│ 2│FD00:ABCD:ABCD:ABCD:      │
│   928:AF27:D3E7:61F3        │
│ Link local address          │
│ 1│FE80::928:AF27:D3E7:   ▼  │
├─────────────────────────────┤
│ ▭▭▭▭   ▭▭▭▭   ▭▭▭▭           │
└─────────────────────────────┘
```

Assigned configuration:
The ARGUS will display the IP configuration assigned by the server:
- Global Unicast Address
- Link Local Address

Use the cursor keys to scroll to additional information.

Close the results display.

```
┌─────────────────────────────┐
│ IPv4                     ▤  │
├─────────────────────────────┤
│ Assigned PPP config.     ▲  │
│ IP       │  10. 67. 15.   3 │
│ Gateway  │ 192.168. 15. 99  │
│ DNS 1    │ 192.168.  4.253  │
│ DNS 2    │ 192.168.  4.253  │
│                             │
│                          ▼  │
├─────────────────────────────┤
│ ▭▭▭▭   ▭▭▭▭   ▭▭▭▭           │
└─────────────────────────────┘
```

Assigned configuration:
The ARGUS will display the IP configuration assigned by the server:
- IP address received
- Gateway IP address
- DNS Server available

Close the results display.

11 Services

Four services are presented on the Status screen (see explanation on page 82).
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 each service independently of the other services.

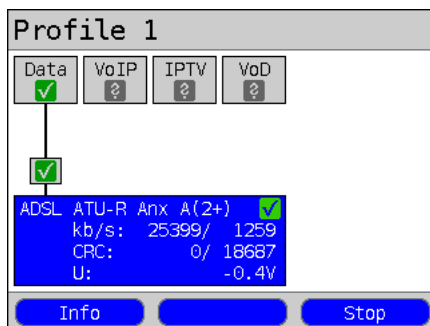An example of the display with the possible services.
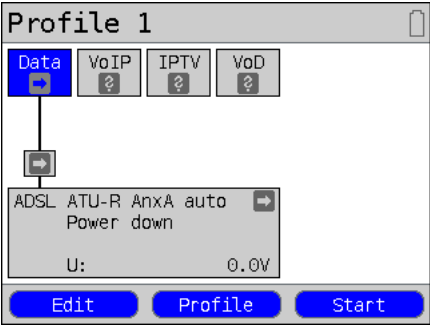
<Edit>   To assign the service a Virtual Line (VL) profile and configure the service.

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

Services:			
Data	VoIP	IPTV	VoD
- IP ping	- IP ping	- IP ping	- IP ping
- Trace route	- Trace route	- Trace route	- Trace route
- HTTP download	- VoIP call	- IPTV	
- FTP download	- VoIP wait	- IPTV scan	
- FTP upload		- IPTV passive	
- FTP server			

11.1 Display the Service Statistics

ARGUS - Status screen
The physical layer, Virtual Line and service are activated.
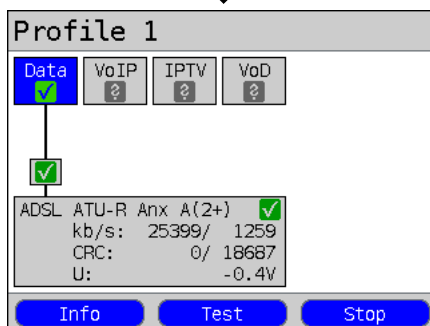
Use the cursor to select a service (in this example, Data)
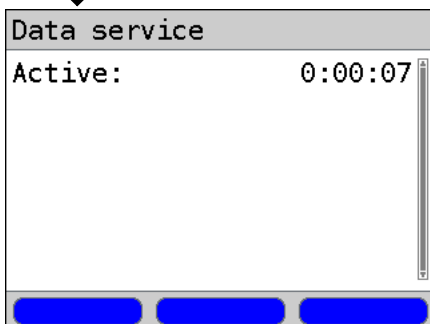
<Info> Display how long the selected service has been activated.

⚠️ If the VoIP service is selected, Info will display the VoIP call parameters, see page 167.

Exit the display and return to the Status screen.

12 Test Overview and Hotkey Assignment

Test Overview

Table of the tests possible on an xDSL or Ethernet access:

Interface / Test	ATU-R	VTU-R	AUT-R BR / VTU-R BR	ATU-R RT / VTU-R RT	Ethernet
Loop see page 108	-	-	x	x	x
VPI/VCI scan, see page 112	x	-	x*1	x*1	-
ATM OAM ping, see page 116	x	-	x*1	x*1	-
IP ping see page 120	x	x	-	x	x
Trace route see page 127	x	x	-	x	x
HTTP download, see page 132	x	x	-	x	x
FTP download, see page 139	x	x	-	x	x
FTP upload, see page 144	x	x	-	x	x
FTP server, see page 149	x	x	-	x	x
VoIP call / Wait see page 170	x	x	-	x	x
IPTV see page 173	x	x	-	x	x
IPTV scan see page 180	x	x	-	x	x
IPTV passive, see page 187	-	-	-	x	x

*1 = ADSL only

In order for the ARGUS to perform these tests (with the exception of the ATM tests: VPI/VCI scan, ATM OAM ping and Loop), you must first configure a Virtual Line. The configuration of a Virtual Line is described in the chapter devoted to Virtual Lines, see page 82.

Graphic functions:

After setting up an xDSL access or a test, the following graphic functions can be used in the result graphics:

Hotkey	**ADSL/VDSL**	**DMT Analysis**
Numeric key 2	Zoom	Zoom
Numeric key 3	Cursor	Cursor
Numeric key 4	-	Tones
Numeric key 5	-	Mode
Numeric key 7	-	Probe
Numeric key 9	Settings x-axis	-
✓	Continue	New

Hotkey Assignment

The ARGUS keypad can be used to call up or start the main functions and/or tests directly. The selection of hotkeys available depends on the type of access selected (in the table below on an xDSL or Ethernet):

Hotkey	Service	ADSL	VDSL	Ethernet
Numeric key 0	ARGUS-State	x	x	x
Numeric key 1	Help hotkeys	x	x	x
Numeric key 2	VPI/VCI scan	x	-	-
Numeric key 3	IP ping	x	x	x
Numeric key 4	Trace route	x	x	x
Numeric key 5	HTTP download	x	x	x
Numeric key 7	FTP download	x	x	x
Numeric key 8	Trace/remote	x	x	x
Numeric key 9	IPTV	x	x	x
📞	VoIP call	x	x	x
⏻	Status screen	x	x	x
One after the other 🔆 and 0️⃣	Quick access to the Access Menu	x	x	x
One after the other 🔆 and 1️⃣	Displays ARGUS-specific information, such as ARGUS type, SW version, S/N., own MAC addresses, SW options etc.	x	x	x
One after the other 🔆 and 2️⃣	Restore the saved settings, see page 205.	x	x	x
	⚠ The speed-dialling memory for numbers, settings (e.g. PPP user name, IP addresses etc.), profile / profile names, user-specific services, keypad infos and all of the test results stored in the ARGUS will be deleted if the settings have not been saved before hand, see page 205.			
One after the other 🔆 and 3️⃣	All settings will be reset to the default factory settings, see page 205.	x	x	x

Different hotkeys will be available depending on the type of access selected (in this example Copper Tests):

| Hotkey	Service	Cu Tests Status
Numeric key 0	ARGUS-State	x
Numeric key 1	Help hotkeys	x
Numeric key 5	Send test results to a PC	x
Numeric key 7	Open speed-dialling memory	x
Numeric key 8	Trace/remote	x
One after the other ⊛ and 🔟	Quick access to the Access Menu	x
One after the other ⊛ and 1	Displays ARGUS-specific information, see page 106.	x
One after the other ⊛ and 2	Restore the saved settings	x
	⚠ The speed-dialling memory for numbers, settings (e.g. PPP user name, IP addresses etc.), profile / profile names, user-specific services, keypad infos and all of the test results stored in the ARGUS will be deleted if the settings have not been saved before hand, see page 207.	
One after the other ⊛ and 3	All settings will be reset to the default factory settings, see page 205.	x

13 Loop

A loop can only be setup 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:
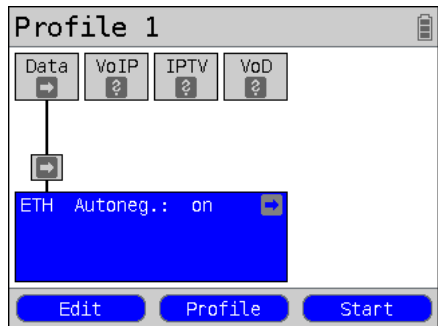
ARGUS - Status screen
In this example: Ethernet Access
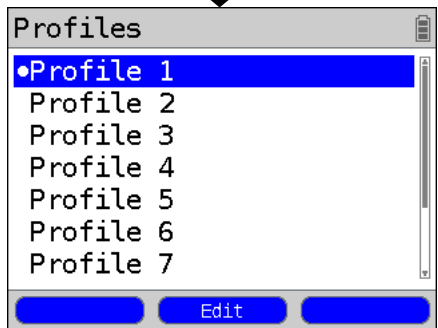
Select a profile for editing. The
selected profile will be marked blue
in the display. The default profile
will be marked in the display with a
●. The ARGUS will use the
parameters in the default (preset)
profile to setup the Ethernet
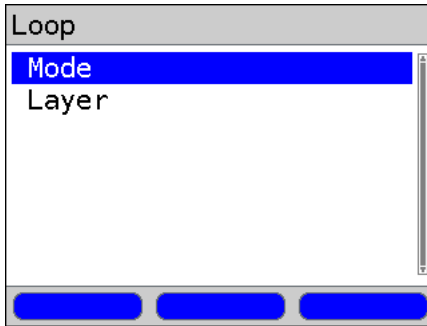connection and for the loop.

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

Test parameters

Loop

Continuation on
next page

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

Settings
 - Mode
 - Layer
select and edit.

Quit the menu without saving the changes.

View and edit
the marked parameters if
necessary

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

Start Loop (Access Mode: Ethernet)
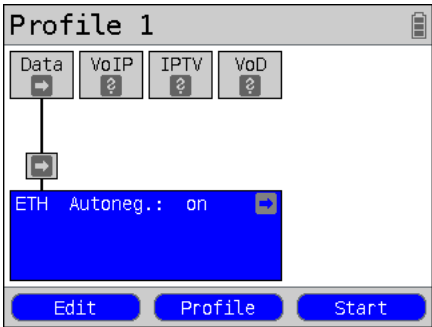
Profile 1 ▇	Set up the Ethernet connection
Data → VoIP IPTV VoD	
→	The profile shown in the display (in this example, Profile 1) will be used for the loop.
ETH Autoneg.: on →	
Edit Profile Start	**\<Start\>** Activate Ethernet
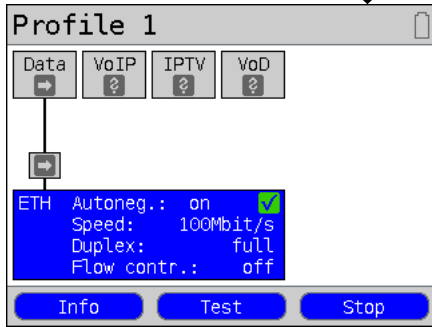
Profile 1		
Data → VoIP IPTV VoD		
→		
ETH Autoneg.: on ✓ Speed: 100Mbit/s Duplex: full Flow contr.: off	**\<Info\>**	Display the Ethernet connection parameters
Info Test Stop	**\<Test\>**	Display the available tests
	\<Stop\>	Stop the Ethernet connection
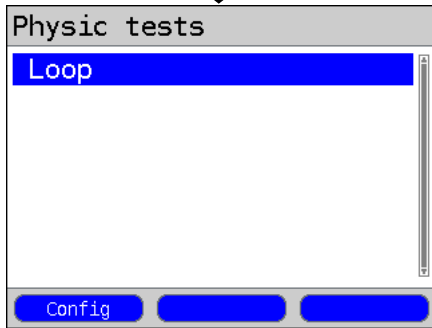
Physic tests		
Loop		
Config	**\<Config\>**	Change the loop parameters, see Page 109

```
Loop
Duration:        0:00:16
Looped:               41
Looped in 1s:          7
Loop rate:    24.000 Kb/s
00:12:A8:30:2F:46



       Status
```



```
Loop
Loop stopped
Duration:        0:00:39
Looped:              282
avg.:                7/s




       Status
```


The loop is started:

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

Saving the results

The results of the Loop test are saved in the same manner as for an ADSL access, see Page 50.

14 ATM Tests

The following ATM tests can only be performed on an ADSL interface. Other interfaces, such as VDSL or Ethernet are not based on ATM technology.

14.1 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:
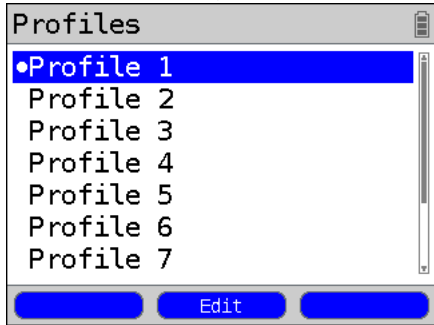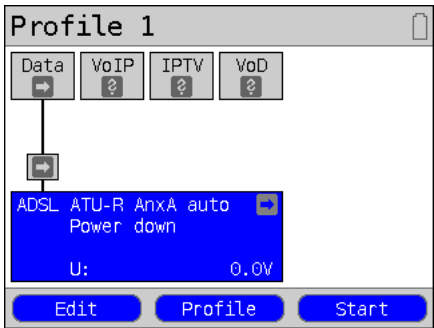
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the xDSL connection and for the VPI/VCI Scan.

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

```
Test parameters
```

⬇ ✓

```
VPI/VCI scan
```

⬇ ✓

```
VPI/VCI scan
┌─────────────────────────────┐
│ VPI                       ▲ │
│ VCI                         │
│ Number of scans             │
│ Timeout                     │
│                             │
│                           ▼ │
└─────────────────────────────┘
```

View and edit the
marked parameters   ⬇ ✓
if necessary

Setting	Explanation
Test parameters:	
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*

Start a VPI/VCI Scan
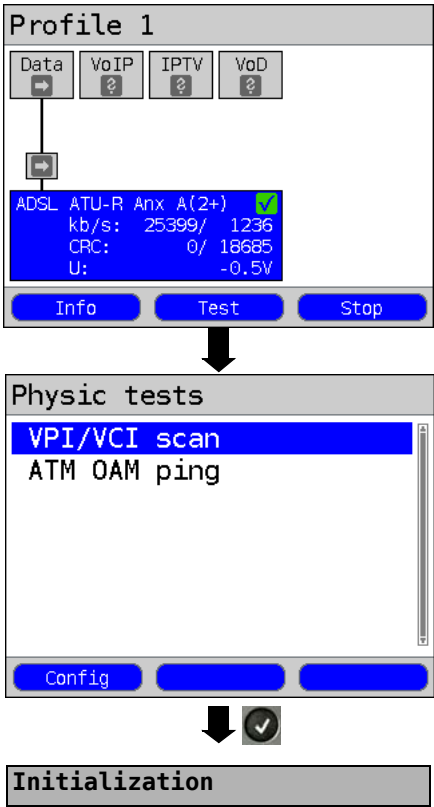
```
Profile 1
┌──────┬──────┬──────┬──────┐
│ Data │ VoIP │ IPTV │ VoD  │
│  ➡   │  🔋  │  🔋  │  🔋  │
└──────┴──────┴──────┴──────┘

┌──┐
│➡ │
└──┘
ADSL ATU-R Anx A(2+)  ✅
    kb/s: 25399/ 1236
    CRC:      0/ 18685
    U:          -0.5V
┌──────────┬──────────┬──────────┐
│   Info   │   Test   │   Stop   │
└──────────┴──────────┴──────────┘
```

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

```
Physic tests
┌─────────────────────────────┐
│ VPI/VCI scan                │
│ ATM OAM ping                │
│                             │
│                             │
│                             │
│                             │
│                             │
│                             │
├──────────┬────────┬─────────┤
│  Config  │        │         │
└──────────┴────────┴─────────┘
```

<Config>   The ARGUS will display the test parameters for the VPI/VCI Scan, see Page 113.

```
Initialization
```

The VPI/VCI Scan starts automatically.

VPI/VCI Scan

```
VPI/VCI scan
┌─────────────────────────────┐
│ Scan VPI:   1               │
│ Scan VCI:   34              │
│ active:1   / 32             │
│                             │
│                             │
│                             │
│                             │
│                             │
├──────────┬────────┬─────────┤
│          │ Status │         │
└──────────┴────────┴─────────┘
```
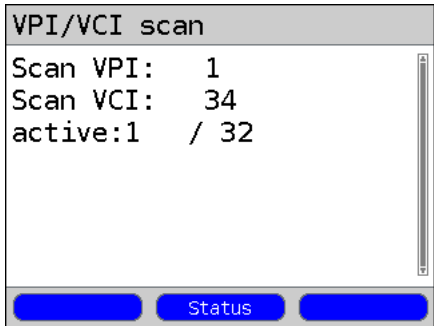
The ARGUS displays the VPI/VCI combination currently being tested and the last VPI/VCI combination that was found to be active (in the example, 1/32).

<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

	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> Display the Status screen

**<New>** Start a new VPI/VCI Scan

Close the results display

Save the result?

For information on saving the results, see IP Ping Page 126.

14.2 ATM OAM Ping

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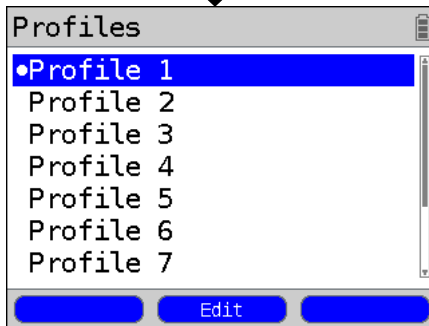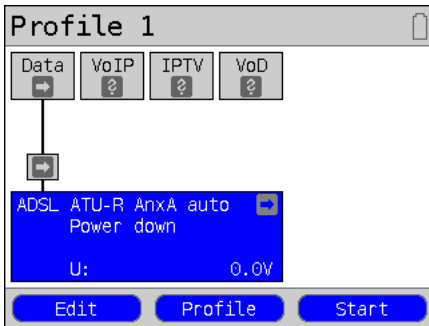
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the xDSL connection and for the ATM OAM ping.

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

Continuation on next page

ATM ping

VPI/VCI
Number of pings
Timeout
OAM cell type

View and edit the marked
parameters if necessary

Setting	Explanation
Test parameters:	
ATM OAM ping:	
VPI / VCI	Entry of the VPI and VCI for the ATM OAM ping Range: VPI: 0 to 255, VCI: 32 to 65535 Default setting: **VPI: 1, VCI: 32**
Number of pings	This sets the number of test packets that the ARGUS will send. If you enter "0", the ARGUS will send packets continuously until the ATM OAM ping is stopped manually. Range: 1 to 99999 Default setting: **3**
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: **1 second**
OAM cell type	F5 The loopback cell will be answered by the first ATM node of the virtual channel. The loopback cell will be answered by the first ATM node of the virtual channel. F5 loopback ete The loopback cell will be answered by the endpoint of the virtual channel. Default setting: **F5 loopback ete**
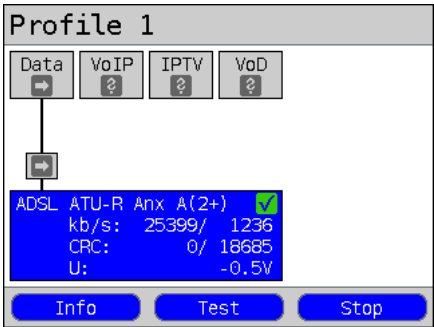
Start ATM OAM ping

Profile 1

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
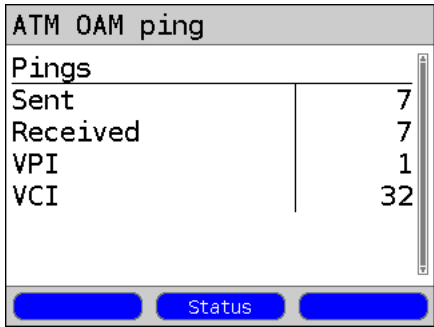
Physic tests
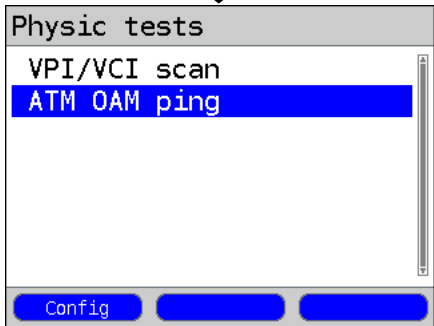
<Config>   The ARGUS will display the test parameters for the ATM OAM ping, see Page 117.

The ATM OAM ping test will start automatically.

Initialization

ATM OAM Ping

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 Status screen without stopping the test; see above.

Cancel the test.

ATM OAM ping result

```
ATM OAM ping

Pings
Sent                    27
Received                27
Lost                     0


          Status      New
```

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

```
ATM OAM ping

Times [ms]
Min                   11.0
Max                   14.0
Avg                   12.0



          Status      New
```

<Status> Display the Status screen.

<New> Start a new ATM OAM ping test.

Save the result?

For information on saving the results, see IP ping Page 126.

15 IP Tests

15.1 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
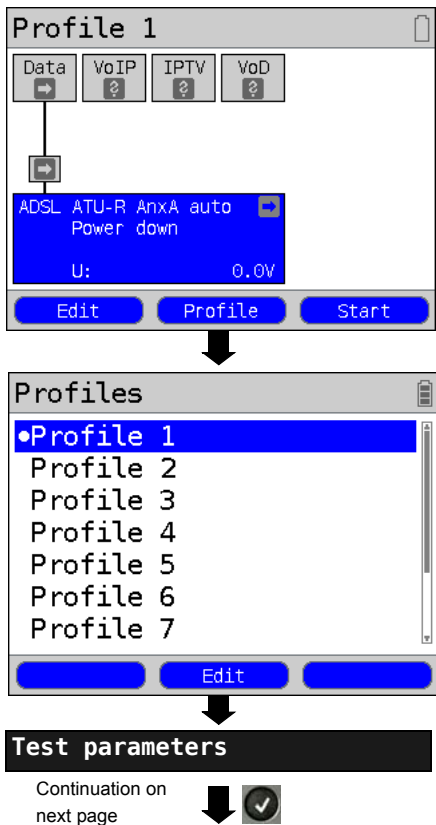
ARGUS - Status screen.

<Edit>   Setting the ADSL parameters.

<Profile>   Profile settings are like those for ADSL, see page 30.

<Start>   Start physical layer.

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.

```
IP ping
```



```
IP ping

IP address
Number of pings
Delay
Packet size
Fragmentation
```

View and edit the
marked parameters if
necessary

Setting	Explanation
Test parameters:	
IP ping:	
IP address	This is the address of the remote site. The ARGUS can save up to 10 IP addresses. The saved IP addresses are available to all of the profiles.

```
IP address  2/10

 www.argus.info
•www.heise.de
  0.  0.  0.  0
  0.  0.  0.  0
  0.  0.  0.  0
  0.  0.  0.  0
  0.  0.  0.  0

              Edit
```

The ARGUS shows the memory locations (a total of ten) available for storing IP addresses. Use the cursor keys to mark the memory location with the IP address that you wish to edit (in this example, the first memory location is marked (1/10)).

<Edit>   Open the marked IP address to edit it.

```
● as name, IPv4 or IPv6
number
```

The address can be entered as an IPv4 or IPv6 number, or as a name.
Default setting: *www.argus.info*

Continuation on next
page

IP address as an IPv4 number

```
IPv4 address:                    ▤

    1 92.168.0  .1

  (min=0, max=255)



          Delete
```

IP address as an IPv6 number

```
IPv6 address:                    ▤

   0 000:0000:0000:0000
   0000:0000:0000:0000

     (*1=A,...,*6=F)



          Delete
```

Enter the IPv4 or IPv6 address as a number.
Use the numeric keypad to make the entry.

\<Delete\>	Delete the character before the cursor.
✱ ❶ to ✱ ❻	When entering an IPv6 address, the key combinations can be used to enter the letters A to F.
✓	Set the marked IP-address as the default address

Use the softkey on the right to shift the keypad (the softkey on the right assumes a different meaning when pressed):
For information on entering the address as a name, see User name on page 94.

\<12\>ab	Entry of the digits 0 to 9 plus * and #
\<ab\>AB	To enter lowercase letters and @, /, -, .
\<AB\>12	To enter uppercase characters and @, /,- and .
◖◗	Move the cursor within the line.

Number of pings	Enter the number of test packets that the ARGUS should send to the IP address. If you enter a zero ("0"), the ARGUS will send packets continuously until the test is stopped manually. Range: 1 to 99999 Default setting: **10**
Pause	This setting determines the amount of time that the ARGUS will wait between sending test packets. Range: 0.1 to 9.9 seconds Default setting: **1 second**
Packet size	This setting determines the size of the test packets. By varying the size, it is possible to determine the maximum data packet size and the relationship between size and response time. Range: 36 to 55,555 bytes Default setting: **84 bytes**

`Fragmentation`	This parameter sets the fragmentation: Default setting: ***on***	
	`on`	Depending on the network (or router), test packets may be divided into multiple packets.
	`off`	Fragmentation is not permitted, i.e. the test packets may be rejected by the network (or router). In this case, the ARGUS will not receive a packet in reply.
	`auto`	The ARGUS determines the maximum packet size for the path to the destination address (Path-MTU) and splits the test packet into smaller packets. These can then be sent with the minimum of delay (since the network/router need not fragment the test packet).

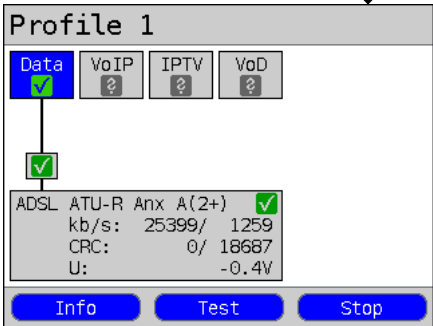**Start IP ping (in the example, Access mode ATU-R, already active):**

Profile 1

Data VoIP IPTV VoD

ADSL ATU-R Anx A(2+)
kb/s: 25367/ 1272
CRC: 0/ 18687
U: -0.4V

Edit   Start
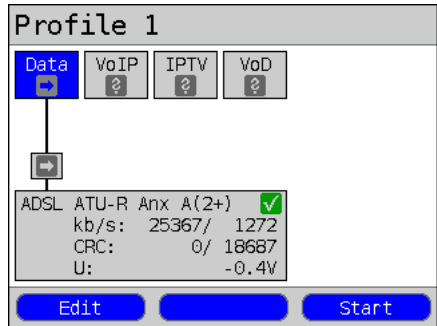
Set up the service

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

<Edit>   Assign Virtual Lines to the Data service.

If no xDSL or Ethernet connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).
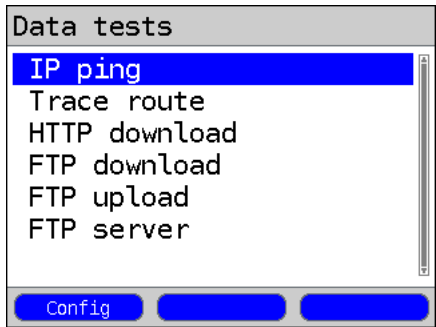
Profile 1

Data VoIP IPTV VoD

ADSL ATU-R Anx A(2+)
kb/s: 25399/ 1259
CRC: 0/ 18687
U: -0.4V

Info   Test   Stop

The Data service and ADSL connection are active.

<Info>   Duration of the activation

<Test>   Open test selection

<Stop>   Deactivate service

Continuation on next page

Data tests

IP ping
Trace route
HTTP download
FTP download
FTP upload
FTP server

`Config`

e.g. select IP ping

<Config> Change the IP ping parameters, see page 121.

IP address 2/10

www.argus.info
●www.heise.de
  0. 0. 0. 0
  0. 0. 0. 0
  0. 0. 0. 0
  0. 0. 0. 0
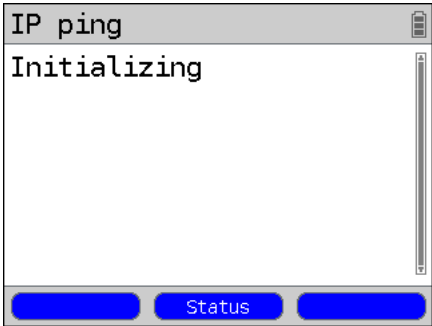 0. 0. 0. 0
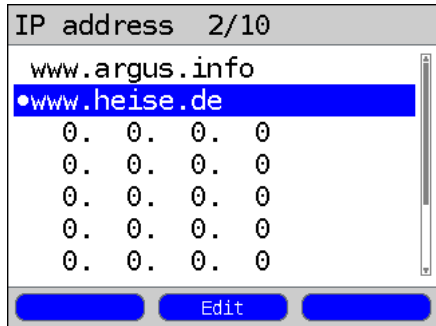
`Edit`

The ARGUS displays the address stored in the profile.

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

<Edit> Open address for editing, see page 121.

IP ping

Initializing

`Status`

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

⚠ In this example, a ping test is being run on a line using the IP version IPv4. The test would be run in a similar manner on a line with IPv6.

IP ping

The IP ping will start automatically.

```
IP ping                       ▤
Pings
Sent                          3
Received                      3
Times [ms]
Minimum                    40.3
Maximum                    61.3
Average                    47.9
 ▮ Destinat.    Status ▮    ▮        ▮
```

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

<Destinat.> Displays the URL and IP address.

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

❌ Test Canceled
The ARGUS will display the results collected thus far and will inquire whether to save them (see page 126).

IP ping results

```
IP ping                       ▤
Pings
Sent                         10
Received                     10
Repeated                      0
Checksum error                0
Error                         0
 ▮ Destinat.    Status ▮    New ▮
```

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

```
IP ping                       ▤
Times [ms]
Minimum                    39.5
Maximum                    72.5
Average                    45.7




 ▮ Destinat.    Status ▮    New ▮
```
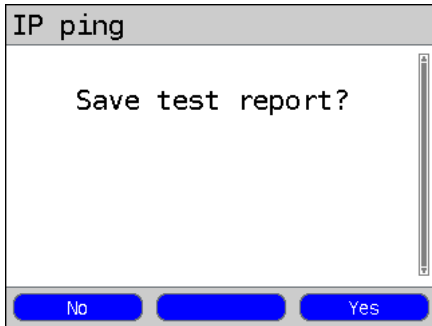
<Destinat.> Displays the URL and IP address.

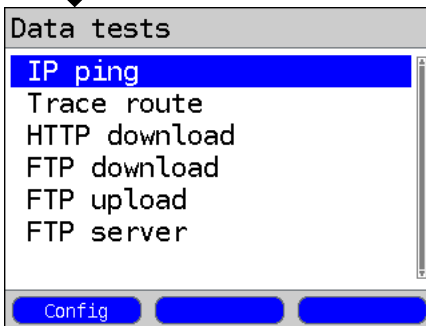**<Status>** Display the Status screen without stopping the test.

<New> Start a new IP ping test

```
┌─────────────────────────────┐
│ IP ping                     │
├─────────────────────────────┤
│                             │
│    Save test report?        │
│                             │
│                             │
│                             │
│                             │
│                             │
├─────────────────────────────┤
│    No    │         │   Yes   │
└─────────────────────────────┘
```

<Yes> The ARGUS will save the result of the IP ping test in the first available memory location in the internal memory (see page 198).

<No> The ARGUS will discard the results and return to the previous selection menu.

"Sending the Trace file to a PC", see page 97.

```
┌─────────────────────────────┐
│ Data tests                  │
├─────────────────────────────┤
│  IP ping                    │
│  Trace route                │
│  HTTP download              │
│  FTP download               │
│  FTP upload                 │
│  FTP server                 │
│                             │
├─────────────────────────────┤
│  Config  │         │         │
└─────────────────────────────┘
```

A new test can be started if required. The xDSL connection and the service are still setup (to clear the connection down, press **<stop>** in the status display).

```
┌─────────────────────────────┐
│ IP ping                     │
├─────────────────────────────┤
│ Error occured!              │
│ Layer:    PPP               │
│                             │
│                             │
│                             │
│                             │
│                             │
├─────────────────────────────┤
│         │  Status  │         │
└─────────────────────────────┘
```
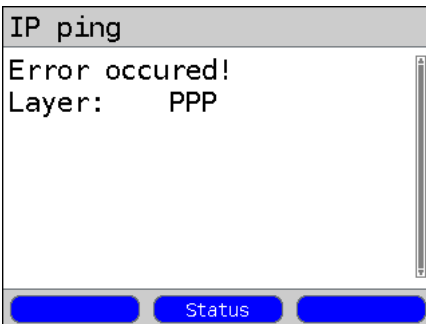
IP ping – Error messages

If an error occurs, the ARGUS will display an error message.

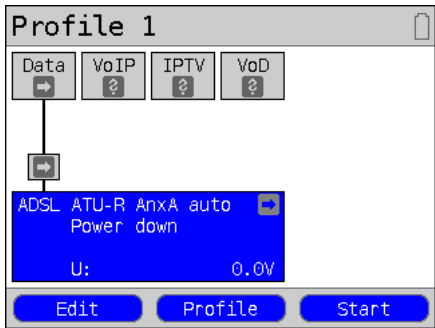**<Status>** Displays the Status screen.

For a description of the error messages, please see the appendix, page 219 et seq.

15.2 Trace Route

In an IP Trace route test, the ARGUS sends test packets and then displays a list of all of the network nodes (hops) and their response times on the way to the destination address. This information can then be used to precisely locate delays in the network.
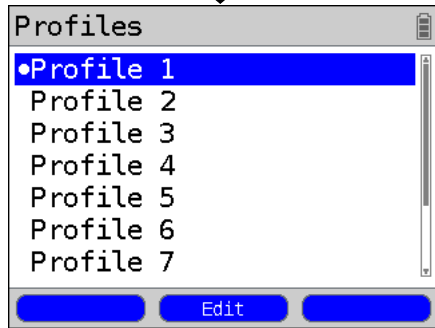The following parameters (which are stored in the profile) are required for the IP Trace route test:

Protocol-independent parameters:

ARGUS - Status screen

<Edit> Setting the ADSL parameters.

<Profile> Profile settings are like those for ADSL, see page 30.

<Start> Start physical layer

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 Trace route test.

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

Continuation on next page

Edit the marked
parameters if necessary

Setting	Explanation
`Test parameters:`	
`Trace route:`	
`IP address`	The IP address of the destination node can be entered as an IP number or as a name (URL) (for instructions, see IP Ping / IP address on page 122). Default setting: *www.argus.info*
`Maximum hops`	This sets the maximum number of hops that will be taken in the path to the destination node. Range: 1 to 25 Default setting: *25*
`Probes`	This sets the number of attempts that will be made to get a response from a network node. Range: 1 to 10 Default setting: *3*
`Timeout`	This sets the maximum amount of time that the ARGUS will wait for a response from a network node. Range: 0.05 to 9.9 seconds Default setting: *3 seconds*

ARGUS 141

Start Trace Route

(In the example: Access mode ATU-R, already active)
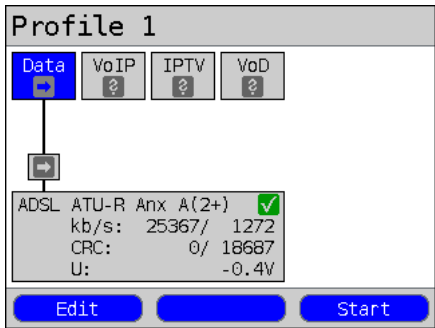
Set up the service.

The profile shown on the display will be used for the Trace route test (in this example, Profile 1).

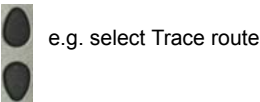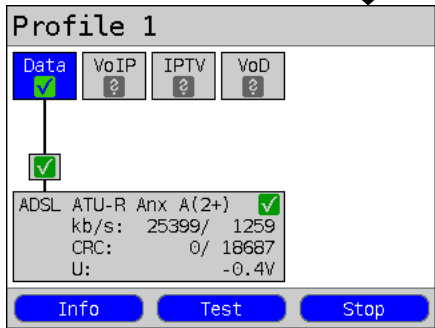**<Edit>** Assign a Virtual Line to the Data service.

If no xDSL or Ethernet connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).
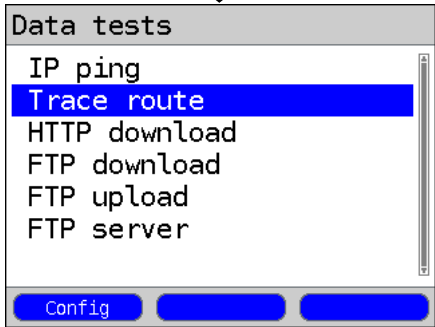
The Data service and ADSL connection are active.

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service

e.g. select Trace route

<Config> Change the Trace route parameters, see page 127.

```
IP address  2/10
 www.argus.info
●www.heise.de
   0.  0.  0.  0
   0.  0.  0.  0
   0.  0.  0.  0
   0.  0.  0.  0
   0.  0.  0.  0
         Edit
```

The ARGUS displays the IP address or URL stored in the profile.

 Select the address to use for the Trace route test; the default address is marked with an ●.

<Edit> Open the address to be edited, for more information, see page 121.

⚠ In this example, a Trace route is being run on a line with IP version IPv4. The test would be run in a similar manner on a line with IPv6.


```
Initialization
```

Trace route

```
Trace route
Hop  | 3- 1
Time | 0.035s
IP   | 217.  0.116.223
Name | ---
    Destinat.    Status
```

The Trace route test will start automatically.

During the Trace route test, the display shows:

- The current hop and probe (in the example 1 -3: i.e. first hop and 3rd probe)
- Response time of the hop in the current probe (0.035 seconds)
- The IP address of the current hop; in this example, 217.0.116.223

<Destinat.> Displays the URL and IP address.

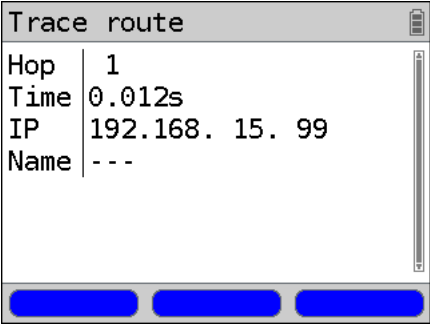**<Status>** Display the Status screen without stopping the test.

 Cancel Test
The ARGUS displays the test results determined up to this point and asks whether it should save them.

Trace route result

```
Trace route
1|192.168. 15. 99  |OK
2|192.168.  4.253  |OK
3|217.  0.116.223  |OK
4|217.  0. 77.234  |OK
5|217.  5. 77. 21  |OK
6| 62.154.  0.166  |OK
7| 62.154. 15.210  |OK
    Destinat.   Status   Detail
```

Display after the Trace route has been run:

- All the hops and an OK / FAIL evaluation are displayed.

<Detail> Displays the IP address of the hop as a name (if possible). The details of the hop, which is at the top of the list shown above, will be displayed (in this example, hop 1).

```
┌─────────────────────────────────────┐
│ Trace route                       ▤ │
├─────────────────────────────────────┤
│ Hop  │ 1                         ▲  │
│ Time │0.012s                        │
│ IP   │192.168. 15. 99               │
│ Name │- - -                         │
│                                     │
│                                  ▼  │
├─────────────────────────────────────┤
│  ▭▭▭▭▭▭    ▭▭▭▭▭▭    ▭▭▭▭▭▭        │
└─────────────────────────────────────┘
```

Close the results display.

Save the Trace route results, also see IP ping (seepage 126).
Sending the Trace file to a PC (see page 97).

┌─────────────────────────────────────┐
│ **Save the result?**   │
└─────────────────────────────────────┘

15.3 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:
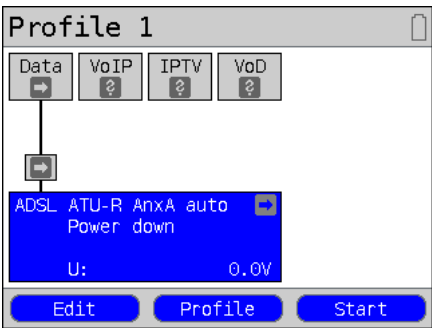
ARGUS - Status screen.

<Edit>   Setting the ADSL parameters.

<Profile> Profile settings are like those for ADSL, see page 30.

<Start>   Start Physic (physical layer)

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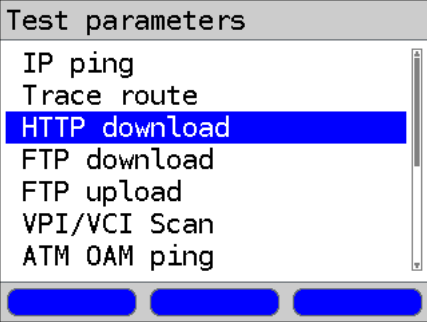
The ARGUS will use the marked profile as the default profile and return to the Settings menu.
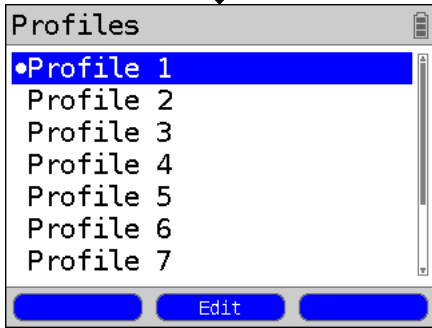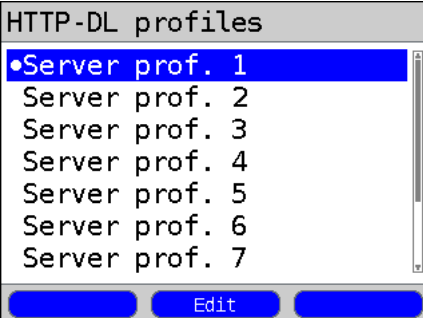

Test parameters

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). If the test duration is less than 10 seconds, the ARGUS will not show any data rate or time at the end of the test.

```
Test parameters
 IP ping
 Trace route
 HTTP download
 FTP download
 FTP upload
 VPI/VCI Scan
 ATM OAM ping
```
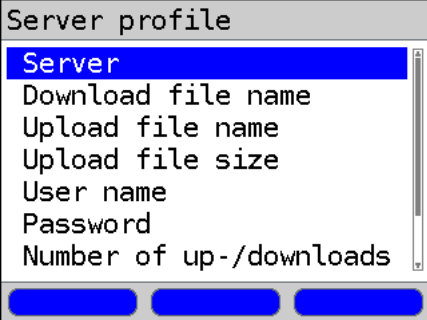
Select HTTP download.

```
HTTP-DL profiles
●Server prof. 1
 Server prof. 2
 Server prof. 3
 Server prof. 4
 Server prof. 5
 Server prof. 6
 Server prof. 7
        Edit
```

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

Edit the marked server profile.

```
Server profile
 Server
 Download file name
 Upload file name
 Upload file size
 User name
 Password
 Number of up-/downloads
```

Edit the marked parameters if necessary

Setting	Explanation
Test parameters:	
HTTP download:	
`Server profile:`	A total of up to 10 user-defined server profiles can be created. These server profiles will then be available for the HTTP download, FTP download and the FTP upload tests. The profiles hold all of the parameters required for the HTTP download, FTP download and the FTP upload.
`Server`	Enter the IP address or URL of the server from which the ARGUS should download the file. In the case of an Upload test: Enter the upload destination (server address) to which the ARGUS should send the data. For information on the softkeys, see page 121.
`Download filename`	The name of the file that the ARGUS should retrieve in the download test (HTTP download or FTP download). When entering a www address alias, please see page 135) For information on the softkeys, see page 121.
`Upload filename`	The filename under which the data – sent in the FTP upload test – should be saved on the server. Default setting: *file*
`Upload file size`	Sets the size of the file that the ARGUS will send in the FTP upload test. Range: 0 to 999 999 999 bytes Default setting: *1 000 000 bytes*
`User name`	Entry of the user name for the (FTP or HTTP) server. For more information on the operation, see page 121.
`Password`	Entry of the password for the (FTP or HTTP) server. For more information on the operation, see page 121.
`Number of up-/ downloads`	The number of times that the ARGUS will retrieve the data from the source address in a Download test. In the case of an Upload test: This sets how often the ARGUS will send the data of the file to the destination. "Zero" means continuously. In which case, the test must be terminated manually. Range: 1 to 9 999 (0 = continuous) Default setting: *3*
`Number of parallel downloads`	The number of packets into which the requested download should be divided and downloaded in parallel (see page 135). Range: 1 to 10 Default setting: *3*
`Profile name`	Entry of a name for the profile

⚠ If an alias www address is entered as the "Source/Destination" address, the ARGUS will "only" download the one HTML page during the HTML download test. The ARGUS does not evaluate the HTML code, so any link to a "true" www address will be ignored. In this case, the ARGUS will not display an error message since the "Source/Destination" address specified will have been loaded without error.

⚠ When entering the "Source" address (server address and download filename) make certain that you use the correct notation (upper and lower case), otherwise the ARGUS will report an Error 301 (Moved Permanently) or Error 404 (Not Found).

⚠ If the ARGUS requests multiple downloads, it will reduce the number of downloads requested to suit the number of downloads supported by the server. This may result in a deviation from the parameters set. This can, for example, be the case if the size of the requested file is unknown.

⚠ Where the name of the file to be downloaded exceeds the maximum permissible length, it is possible to get around this by using the "Server" field for part of the address.
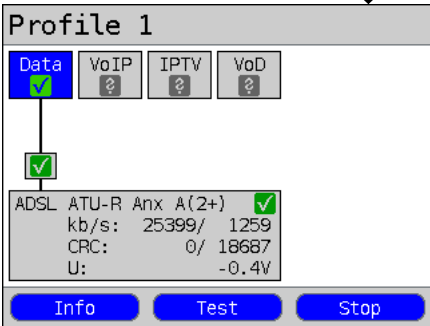The server name may be up to 80 characters long while the file name may be 60 characters long.

Start HTTP download (in this example: Access mode ATU-R, is already active)

Set up the service.

```
Profile 1
┌────┐┌────┐┌────┐┌────┐
│Data││VoIP││IPTV││VoD │
│ ➡ ││ ? ││ ? ││ ? │
└────┘└────┘└────┘└────┘
    │
  ┌──┐
  │➡ │
  └──┘
┌───────────────────────┐
│ADSL ATU-R Anx A(2+) ✅│
│   kb/s: 25367/  1272  │
│   CRC:      0/ 18687  │
│   U:          -0.4V   │
└───────────────────────┘
┌─────────┐┌─────────┐┌─────────┐
│  Edit   ││         ││  Start  │
└─────────┘└─────────┘└─────────┘
```
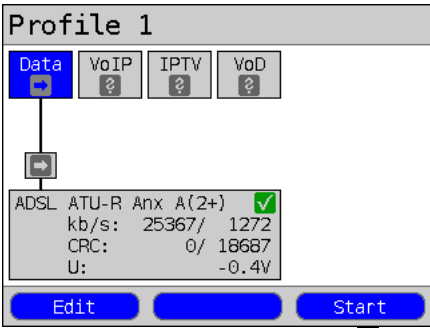
The profile shown on the display will be used for the HTTP download (in this example, Profile 1).

<Edit> Add a Virtual Line to the Data service.

```
Profile 1
┌────┐┌────┐┌────┐┌────┐
│Data││VoIP││IPTV││VoD │
│ ✅ ││ ? ││ ? ││ ? │
└────┘└────┘└────┘└────┘
    │
  ┌──┐
  │✅│
  └──┘
┌───────────────────────┐
│ADSL ATU-R Anx A(2+) ✅│
│   kb/s: 25399/  1259  │
│   CRC:      0/ 18687  │
│   U:          -0.4V   │
└───────────────────────┘
┌─────────┐┌─────────┐┌─────────┐
│  Info   ││  Test   ││  Stop   │
└─────────┘└─────────┘└─────────┘
```

If no connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service

```
Data tests                      🔋
┌─────────────────────────────────┐
│  IP ping                      ▲ │
│  Trace route                    │
│  HTTP download                  │
│  FTP download                   │
│  FTP upload                     │
│  FTP server                   ▼ │
└─────────────────────────────────┘
┌─────────┐┌─────────┐┌─────────┐
│ Profile ││         ││         │
└─────────┘└─────────┘└─────────┘
```
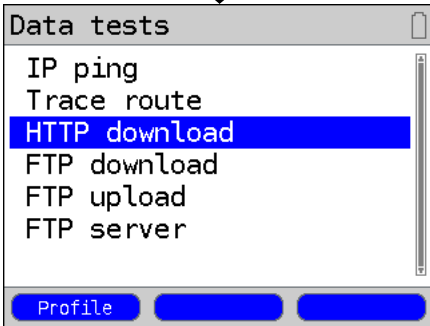
e.g. select HTTP download

<Profile> Display the available HTTP download profiles profile, see page 133.

```
HTTP-DL profiles
•Server prof. 1
 Server prof. 2
 Server prof. 3
 Server prof. 4
 Server prof. 5
 Server prof. 6
 Server prof. 7
         Edit
```
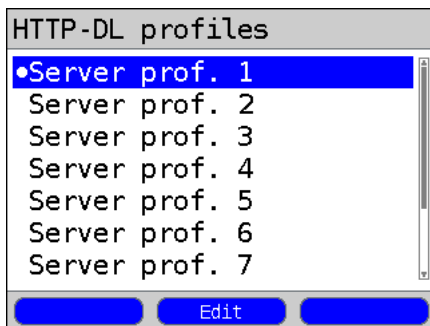
Select the server profile:
(The default is marked with an ●).
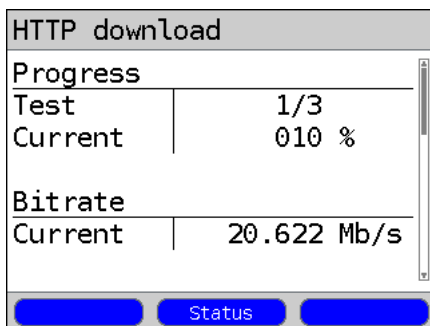
\<Edit\>   Edit the marked profile
For information on changing
the individual settings, see
page 134.

Initialization

The HTTP download will start
automatically.
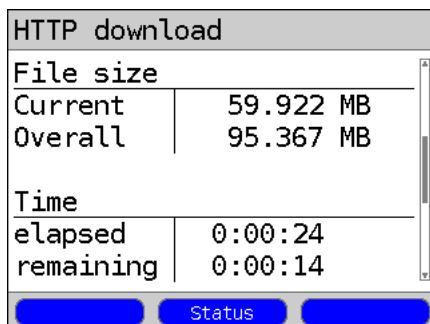
HTTP download

During the HTTP download, the display
shows:

```
HTTP download
Progress
Test              1/3
Current           010 %

Bitrate
Current      20.622 Mb/s
         Status
```

- Current download / Total downloads
  In the example, the first download
  attempt of a total of three (1/3) is shown.

- The amount of data already loaded (in
  the example, 10%)

- Current net download rate (in the
  example, 20.662 Mbit/s)

- The number of bytes already loaded (in
  the example, 59.922 MB)

- Size of the file to be downloaded (in the
  example, 95.367 MB)

- Current loading time in h:min:s

- Remaining loading time in h:min:s

- Number of parallel downloads

```
HTTP download
File size
Current      59.922 MB
Overall      95.367 MB

Time
elapsed       0:00:24
remaining     0:00:14
         Status
```

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

Cancel the test.

HTTP download results

HTTP download	
Bitrate	
Average	20.847 Mb/s
File size	
Overall	95.367 MB
Time	
Average	0:00:38

Status   New

<Status> Display the Status screen

<New> Start a new HTTP download

Display results:
- Calculated average speed of all of the downloads (in the example, 20.847 Mbit/s)
- Size of file loaded (in the example, 95.367 MB)
- Average time required for a download in h:min:s
- Maximum parallel downloads
- Configured parallel downloads

HTTP download	
Parallel downloads	
Max	3
Configur.	3

Status   New

Close the results display

Save the result?

For information on saving the HTTP download results, see page 125. "Sending the Trace file to a PC", see page 97.

15.4 FTP Download

In the FTP download test, the ARGUS will attempt to download a file. The ARGUS will display the current net download rate, the user data of the IP packets, and once the test is over the net average speed (in the case of multiple download attempts). The following parameters (which are stored in the profile) are required for the FTP download:

Protocol-independent parameters:
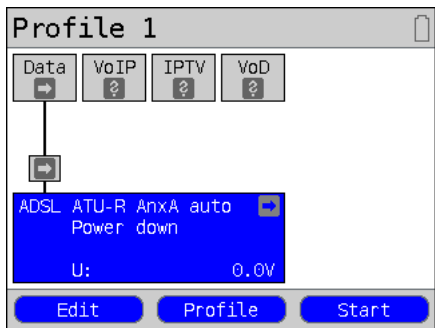
ARGUS - Status screen.

<Edit> Setting the ADSL parameters.

<Profile> Profile settings are like those for ADSL, see page 30.

<Start> Start Physic (physical layer)
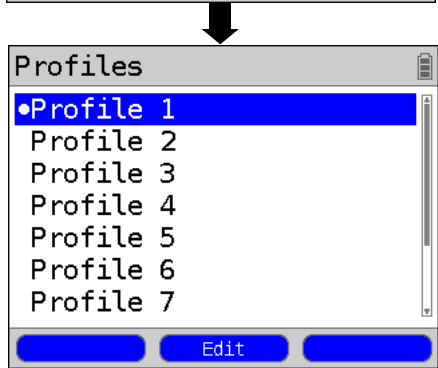
Select a profile for editing. The selected profile will be marked blue in the display. The default profile will be marked in the display with a ●. The ARGUS will use the parameters in the default (preset) profile to setup the Ethernet or xDSL connection and for the FTP download.

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

Test parameters

FTP download

Continuation on next page

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

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

Server profile

Server
Download file name
Upload file name
Upload file size
User name
Password
Number of up-/downloads

View and edit the marked parameters if necessary

FTP download parameters, see page 134

Server	IP address or URL of the FTP server
Download filename	The path and name of the file to be downloaded in the FTP download test
User name	User name for the FTP server
Password	The password for the FTP server
Number	This sets how often the data at the "Source" address should be downloaded
Profile name	Name of the server profile

⚠ 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 download as large a file as is reasonable given the speed of the access. If the test duration is less than 10 seconds, the ARGUS will not show any data rate or time at the end of the test.

Start an FTP download (in this example: Access mode ATU-R, is already active)

```
Profile 1
┌─────┬─────┬─────┬─────┐
│Data │VoIP │IPTV │ VoD │
│ ➡   │  ?  │  ?  │  ?  │
└─────┴─────┴─────┴─────┘
   │
 ┌───┐
 │ ➡ │
 └───┘
   │
ADSL ATU-R Anx A(2+)   ✓
   kb/s:  25367/  1272
   CRC:       0/ 18687
   U:            -0.4V
┌─────────┬─────────┬─────────┐
│  Edit   │         │  Start  │
└─────────┴─────────┴─────────┘
```
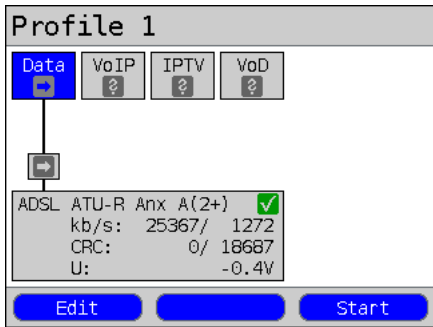
Setup the service

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

<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 36).

```
Profile 1
┌─────┬─────┬─────┬─────┐
│Data │VoIP │IPTV │ VoD │
│ ✓   │  ?  │  ?  │  ?  │
└─────┴─────┴─────┴─────┘
   │
 ┌───┐
 │ ✓ │
 └───┘
   │
ADSL ATU-R Anx A(2+)   ✓
   kb/s:  25399/  1259
   CRC:       0/ 18687
   U:            -0.4V
┌─────────┬─────────┬─────────┐
│  Info   │  Test   │  Stop   │
└─────────┴─────────┴─────────┘
```

<Info>   Duration of the activation

<Test>   Open test selection

<Stop>   Deactivate service
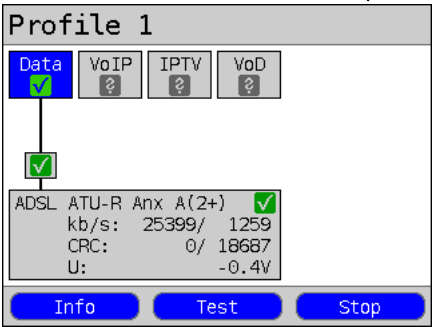
```
Data tests
 IP ping
 Trace route
 HTTP download
 FTP download
 FTP upload
 FTP server
┌─────────┬─────────┬─────────┐
│ Profile │         │         │
└─────────┴─────────┴─────────┘
```
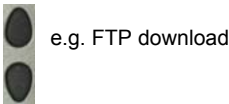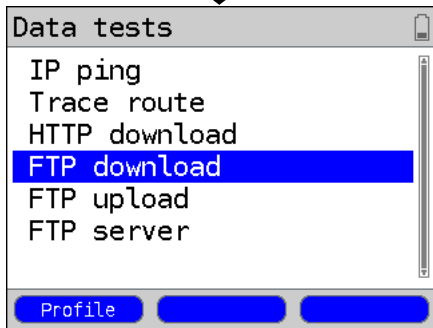
e.g. FTP download

<Profile>   Display the available FTP download profiles, see page 140.

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

Mark the server profile (the default profile is marked with a ●).

<Edit> Edit the marked profile
For information on changing the individual parameters, see page 134.

The FTP download will start automatically.
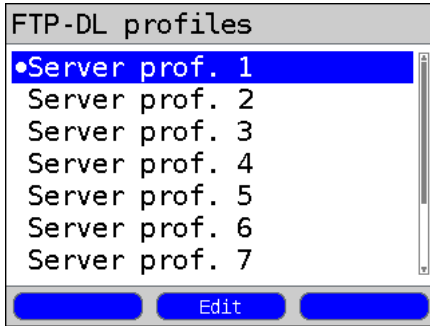
Initialization

FTP download

FTP download

Progress

| Test | 1/3 |
| Current | 013 % |

Bitrate

| Current | 20.548 Mb/s |

Status

During the FTP download, the display shows:

- Current download / total downloads
  In the example the first download of a total of three (1/3) is shown.

- The amount of data already loaded (in the example, 13%)

- Current net average download rate (in the example, 20.548 Mbit/s)

- The number of bytes already loaded (in the example, 87.458 MB)

- Total size of file to be loaded (in the example, 95.367 MB)

- Current duration of the download in h:min:s

FTP download

File size

| Current | 87.458 MB |
| Overall | 95.367 MB |

Time

| elapsed | 0:00:35 |
| remaining | 0:00:03 |

Status

- Remaining loading time

- Number of parallel downloads

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

Cancel the test.

FTP download results

```
FTP download
Bitrate
Average    |  20.823 Mb/s
File size
Overall    |  95.367 MB
Time
Average    |  0:00:38

[          ]  Status    New
```

<Status>   Display the Status screen.

<New>   Start a new FTP download

Display after the FTP download has
finished:

-   Calculated average speed of all the
    downloads (in the example, 20.823 Mbit/s)

-   Size of file loaded
    (in the example, 95.367 MB)

-   Average time required for a download in
    h:min:s.

-   Maximum parallel downloads

-   Configured parallel downloads

```
FTP download
Parallel downloads
Max              3
Configur.        3




[          ]  Status    New
```

Close the results display.

For information on saving the results, see
IP ping page 125.
Form more on sending the trace file to a
PC, see page 97.

```
Save the result?
```

15.5 FTP Upload

In an FTP upload, the ARGUS sends the data in a file to a server. The ARGUS will display the current net upload rate, the user data of the IP packets, and once the test is over the net average speed (in the case of multiple upload attempts). The following parameters (which are stored in the profile) are required for the FTP upload:

Protocol-independent parameters:
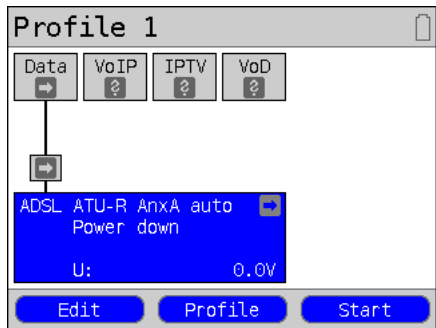
ARGUS - Status screen.

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 FTP upload.

The ARGUS will use the marked profile as the default profile and return to the Settings menu.
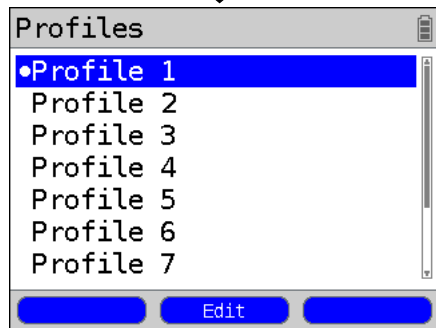
<Edit>	Setting the ADSL parameters.
<Profile>	Profile settings are like those for ADSL, see page 30.
<Start>	Start Physic (physical layer)

Test parameters

FTP upload

```
FTP-UL profiles
●Server prof. 1
 Server prof. 2
 Server prof. 3
 Server prof. 4
 Server prof. 5
 Server prof. 6
 Server prof. 7
        Edit
```

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

```
Server profile
 Server
 Download file name
 Upload file name
 Upload file size
 User name
 Password
 Number of up-/downloads
```

Edit the marked server profile.
FTP upload parameters, seepage 134

Server	IP address or URL of the FTP server
Upload filename	The path and filename under which the file that is sent in the test should be saved on the server.
Upload file size	The size of the file sent
User name	User name for the FTP server
Password	Password for the FTP server
Number	Number of uploads
Profile name	Name of the server profile

View and edit the marked parameters if necessary

⚠ In the case of an upload 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. If the test duration is less than 10 seconds, the ARGUS will not show any data rate or time at the end of the test.

Start FTP upload (in this example: Access mode ATU-R, is already active)

Profile 1

Data [→] | VoIP [?] | IPTV [?] | VoD [?]

[→]

ADSL ATU-R Anx A(2+) ✓
  kb/s: 25367/ 1272
  CRC: 0/ 18687
  U: -0.4V

Edit | | Start
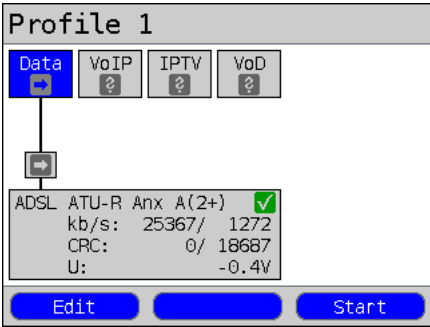
Set up the service.

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

<Edit> Assign Virtual Lines 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 36).

Profile 1

Data [✓] | VoIP [?] | IPTV [?] | VoD [?]

[✓]

ADSL ATU-R Anx A(2+) ✓
  kb/s: 25399/ 1259
  CRC: 0/ 18687
  U: -0.4V

Info | Test | Stop

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service

Data tests

IP ping
Trace route
HTTP download
FTP download
FTP upload
FTP server
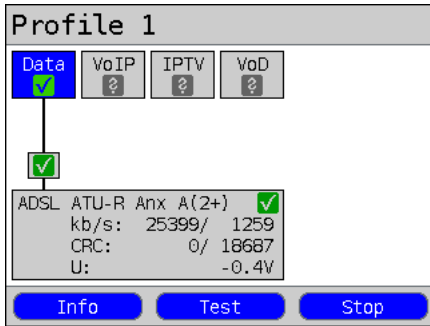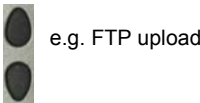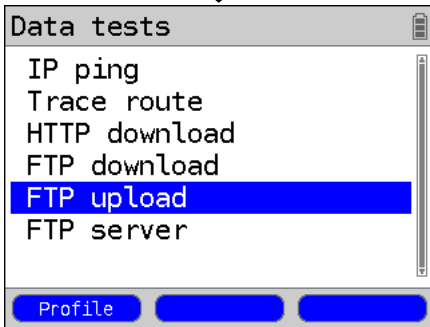
Profile | |

e.g. FTP upload

<Profile> Display the available FTP upload profiles, see page 145.
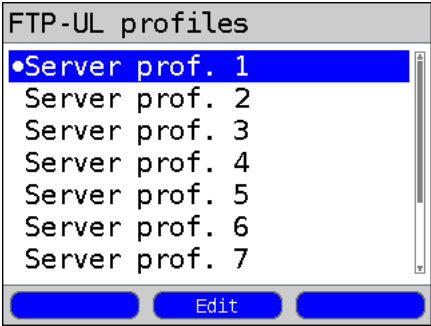
ARGUS 141

FTP-UL profiles

●Server prof. 1
Server prof. 2
Server prof. 3
Server prof. 4
Server prof. 5
Server prof. 6
Server prof. 7

| | Edit | |

Mark the server profile (the default profile is marked with a ●)

<Edit> Edit the marked profile
For information on changing the individual parameters, see page 134.

Initialization

FTP upload

The FTP upload will start automatically.

During the FTP upload, the display shows:

FTP upload

Progress	
Test	1/3
Current	084 %
Bitrate	
Current	1.685 Mb/s

| | Status | |
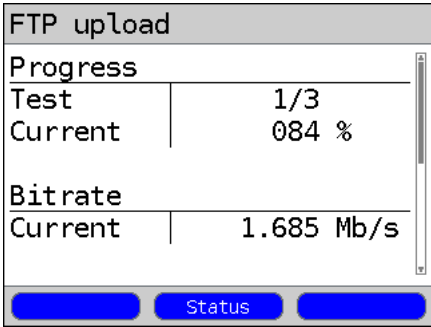
- Current upload / total uploads
  In the example, the first upload of a total of three (1/3) is shown.

- The amount of data already sent (in the example, 84%)

- Current net upload rate (in the example, 1.685 Mbit/s)

- The number of bytes already sent (in the example, 667.230 KB)

- Total file size (in this example, 0.953 MB)

- Current duration of the upload in h:min:s

- Remaining transfer time (sending)

FTP upload

File size	
Current	667.230 KB
Overall	0.953 MB
Time	
elapsed	0:00:04
remaining	0:00:01
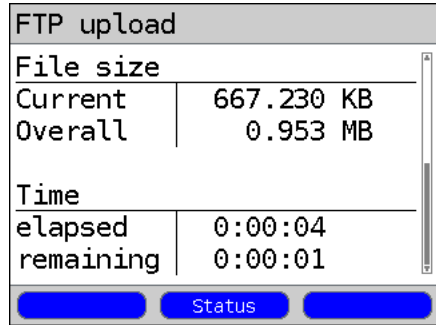
| | Status | |

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

✕ Cancel the test.

FTP upload results

FTP upload	
Bitrate	
Average	1.307 Mb/s
File size	
Overall	95.367 MB
Time	
Average	0:00:26

	Status	New

Display results:
- Calculated average bitrate of all uploads
- The size of the file sent
- The average time required for an upload

\<Status\> Display the Status screen

\<New\> Start a new FTP upload

Save the result?

For information on saving the results, see IP ping page 125.

15.6 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 attainable for this connection.

The throughput test is illustrated in the following on an Ethernet interface.
In this example, two ARGUS testers are used. One is used as an FTP server while the second requests an FTP download.

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 the example: Ethernet is already active)
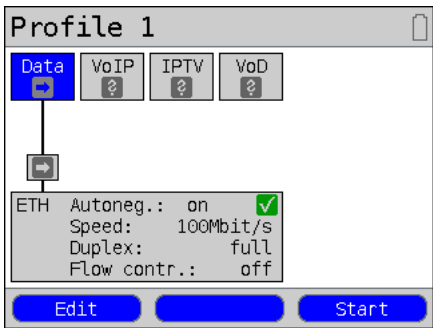
Set up the service.

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

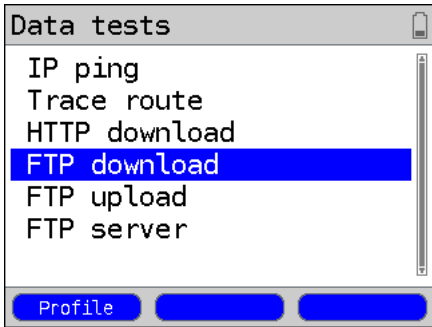**<Edit>**   Assign a Virtual Line to the Data service.

If no connection has yet been setup, a connection will be setup automatically at this point using the default profile, see page 36.

```
Data tests
 IP ping
 Trace route
 HTTP download
 FTP download
 FTP upload
 FTP server
```
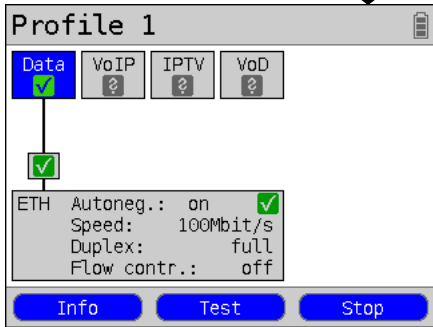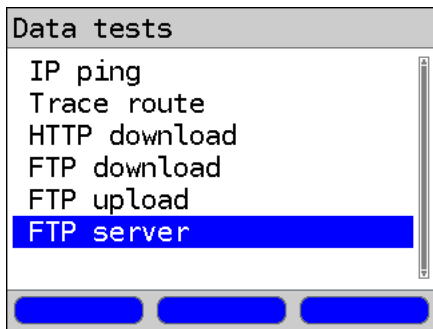
e.g. FTP Server

Initialization

```
FTP server
Active!
IP address:
192.168.  4.156




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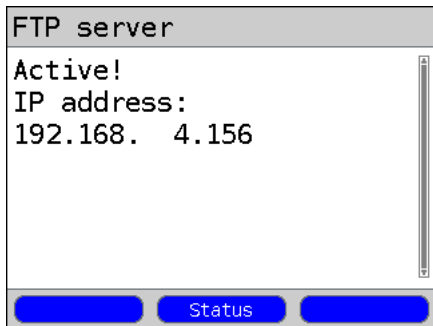
The ARGUS will use the IP address
entered in own "local IP address" as the
destination address (Server) for the
second ARGUS.

\<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.
Netmask and local (own) IP address (IP mode: static) should match the settings of ARGUS 1.

Start an FTP Download:
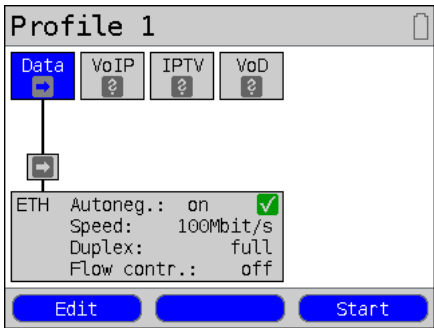
Set up the service.

The profile shown on the display (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 yet been setup, a connection will be setup automatically at this point using the default profile (see page 36).
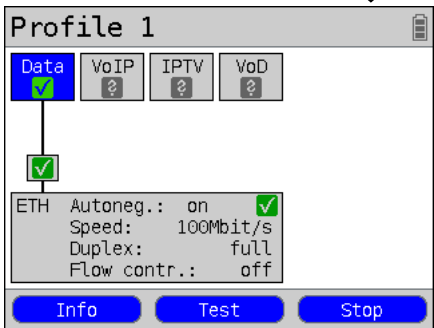
<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service

Continuation on next page

```
┌─────────────────────────────────┐
│ Data tests                    ▯ │
├─────────────────────────────────┤
│  IP ping                      ▲ │
│  Trace route                    │
│  HTTP download                  │
│ █FTP download█                  │
│  FTP upload                     │
│  FTP server                     │
│                               ▼ │
├─────────────────────────────────┤
│ ▐Profile▌ ▐      ▌ ▐      ▌     │
└─────────────────────────────────┘
```

e.g. FTP Download

<Profile> Edit the FTP Download
parameters, see page 140.
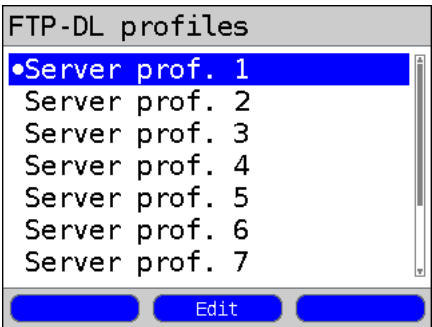
```
┌─────────────────────────────────┐
│ FTP-DL profiles                 │
├─────────────────────────────────┤
│ ●Server prof. 1               ▲ │
│  Server prof. 2                 │
│  Server prof. 3                 │
│  Server prof. 4                 │
│  Server prof. 5                 │
│  Server prof. 6                 │
│  Server prof. 7               ▼ │
├─────────────────────────────────┤
│ ▐      ▌ ▐ Edit ▌ ▐      ▌      │
└─────────────────────────────────┘
```

Mark the server profile (the default profile
is marked with a ●).

<Edit> Edit the marked profile
For information on changing
the individual parameters, see
page 134.

```
┌─────────────────────────────────┐
│ Server profile                  │
├─────────────────────────────────┤
│ █Server█                      ▲ │
│  Download file name             │
│  Upload file name               │
│  Upload file size               │
│  User name                      │
│  Password                       │
│  Number of up-/downloads      ▼ │
├─────────────────────────────────┤
│ ▐      ▌ ▐      ▌ ▐      ▌      │
└─────────────────────────────────┘
```
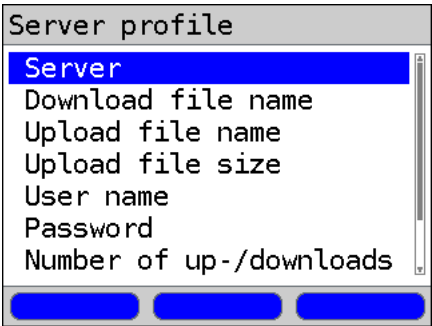
Continuation on
next page

```
Server address:
192.168.4.156█
```
```
             Delete        12>ab
```

In the server profile of ARGUS 2, just enter the IP address of ARGUS 1 in the Server IP address, see page 150.

<Delete>   Delete the character before the cursor

<12>ab>   see page 94

```
Download filename
```

```
File size:
        100000000█
        (Byte)
```
```
             Delete
```

Here the download file name is, at the same time, the size of the file to be downloaded.
The download file name: 1 000 000 000 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. If the test duration is less than 10 seconds, the ARGUS will not show any data rate or time at the end of the test.

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

<Edit> Edit the marked profile
For information on changing
the individual parameters, see
page 134.

Initialization

The FTP download will start automatically.

FTP download

During the FTP download, the display
shows:

FTP download

Progress	
Test	1/3
Current	003 %
Bitrate	
Current	70.996 Mb/s

Status

- Current download / total downloads
  In the example the first download of a total
  of three (1/3) is shown.

- The amount of data already loaded
  (in the example, 3%)

- Current net average download rate
  (in the example, 70.996 Mbit/s)

- The number of bytes already loaded
  (in the example, 200.824 MB)

- Total size of file to be loaded
  (in the example, 952.153 MB)

- Current duration of the download in h:min:s

- Remaining loading time

- Number of parallel downloads

FTP download

File size	
Current	200.824 MB
Overall	952.153 MB
Time	
elapsed	0:00:23
remaining	0:01:26

Status

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

Cancel the test.

FTP download results

```
FTP download
────────────────────────────
Bitrate
Average    │   72.550 Mb/s
File size
Overall    │   356.770 MB
Time
Average    │   0:00:41
────────────────────────────
        Status        New
```

<Status> Display the Status screen.

<New> Start a new FTP download

Display after the FTP download has finished:

- The calculated average speed of all the downloads (in this example, 72.550 Mbit/s)
- The size of file loaded (in the example, 356.770 MB)
- Average time required for a download in h:min:s.
- Maximum parallel downloads
- Configured parallel downloads

```
FTP download
────────────────────────────
Parallel downloads
Max        │        3
Configur.  │        3



────────────────────────────
        Status        New
```

Close the results display.

```
Save the result?
```

For information on saving the results, see IP ping page 125.
For more on sending the trace file to a PC, see page 97.

16 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 determined and displayed as an evaluation of the voice quality.
Three "VoIP accounts (Profiles)" can be configured for use in VoIP telephony:

Protocol-independent parameters:
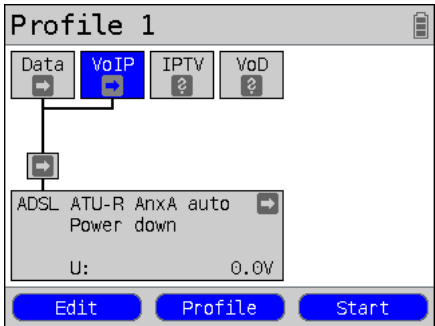
ARGUS - Status screen.

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 VoIP test.

The ARGUS will use the marked profile as the default profile and return to the Settings menu.
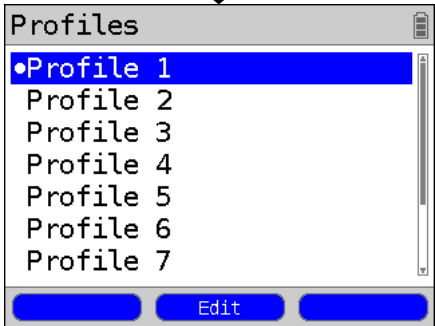
<Edit>   Assign a Virtual Line to the VoIP service.

<Profile>   Profile settings are like those for ADSL, see page 30.

<Start>   Start service

VoIP account

⬇ ✅

VoIP profile

●VoIP profile 1
 VoIP profile 2
 VoIP profile 3

Edit

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

Edit the marked
parameters if
necessary   ⬇ ✅

Setting	Explanation	
VoIP account settings:		
VoIP:	Up to 3 user-defined VoIP profiles can be created. **<Edit>** The selected profile will be opened for editing.	
SIP	User name	User name for the registrar, for more information, see page 94.
	Password	Password for the registrar, for more information, see page 94.
	Registrar Server	Use Registrar: Setting: yes or no. A registrar must also be used if an Internet Telephony Service Provider (ITSP) is used (in such case, you will dial a normal telephone number). A registrar is not needed if you dial a VoIP telephone directly, e.g. via its IP address or the SIP URI. Default setting: *No*
	Outbound Proxy/SBC	Use proxy (SBC = Session Border Controller) This setting specifies whether or not to use outbound proxy. Default setting: *No*
		Outbound Proxy/SBC: Address of the Proxy Server
		Outbound Proxy/SBC Port: Port of the outbound proxy server Range: 0 to 65535 Default setting: *5060*
	SIP domain	Configuration of the domain name for the "From" field in the SIP message (when using an ITPS).
	Listen port	The port used for the incoming SIP signaling. Range: 0 to 65535 Default setting: *5060*
	Remote port	The port used by the remote end: When using a registrar (see Registrar Server Setting on page 158), enter the port number of the Registrar/Proxy Server; otherwise, enter the port number of the remote end. Range: 0 to 65535 Default setting: *5060*
	Authentication	Addtional xTU-R password used for proper authentication with the registrar. For more information, see page 94

ARGUS 141

SIP (Continuation)	Caller ID	Optional entry of any text desired which will then be displayed on the called party's equipment instead of the caller's phone number. For information on the softkeys, see page 94.
	User agent	ID-string or terminal type which will be sent to the called party. Default setting: **Argus141**
	Qualify	Specifies whether or not the proxy server's availability should be checked continuously. Default setting: **No**
	Reg. Expire	Specifies how long a registration with the registrar server is valid. Range: 10 to 6000 seconds Default: **3600 seconds**
	Del. exist. registrar	Delete the registration with the registrar server. When set to "yes", the ARGUS will be exclusively registered with the registrar server.If it is set to "no", it will be put in the list of existing registrations. Default setting: **Yes**
Phone Settings	RTP port range	The SIP signaling and RTP data will be sent to different ports. The port range used for RTP can be configured for use e.g. with a router. Range: 0 to 65535 Default: Start: **10 000** End: **20 000**
	Silence detection	If this is set to "ON", the ARGUS will not send speech packets when there is silence (a break in the speech). This can, however, lead to problems with the assignment of ports if there is a NAT router in the path. If this setting is set to "not used", the (remote) link partner will not be notified as to "silence detection" setting. The setting will, however, remain. Default setting: **Off**

Phone Settings (Continuation)	Jitter buffer	Sets whether the size of the jitter buffer is static or adaptive. Default setting: *static*	
		static:	Entry of the size of the static jitter buffer Range: 20 to 200 ms nominal: *60 ms*
		adaptive:	Entry of the minimum (min) and maximum (max) sizes of the jitter buffer and the initial value (init). Range: 20 to 600 ms Default setting: min: *60 ms* init: *60 ms* max: *120 ms*
	Codecs	Preparation of a list of voice codecs to be used. If there are multiple codecs in the list, the priority is determined by the order in the list.	
			Switch between softkey sets
		<↓>	The marked codec will be moved down one place in the list.
		<↑>	The marked codec will be moved up one place in the list.
		<Insert>	A display of the still available voice codecs will open. If a voice codec is marked with a in this Codec Selection list, it will be added to the Codec Priority list (in the active list of voice codecs)
		<Delete>	Delete the marked codec from the list
			Apply the codec priorities

Phone Settings (Continuation)	DTMF Settings	DTMF (Dual-tone multi-frequency) is a multi-frequency dialling mode.Mode: DTMF mode settings Choose one of the following settings "automatic", "SIP Info", "RFC 2833" or "inband". Default setting: *automatic* Duration: The VoIP DTMF Time setting Range: 40 to 1000 ms Up to 200 ms in increments of 10, 200 to 300 ms in increments of 20, 300 to 1000 ms in increments of 100. Default setting: *80 ms* Increase or decrease VoIP DTMF time.
STUN server	Use STUN	Use STUN: Setting: yes or no. If there is a NAT router between the ARGUS and the next remote end (gateway), you must use STUN so that the ARGUS can determine which IP address is seen for it (the ARGUS) by the other end.Default setting: *No*
	STUN server	STUN Server: Specifies the address of a STUN server which must be located in the same network (on the same level) as the remote end.
MOS threshold	Entry of the MOS threshold: The MOS value (Mean Opinion Score) is an evaluation of the quality of the speech data. The MOS quality scale ranges from 5 (excellent) down to 1 (bad). The ARGUS will compare the MOS value of the currently active VoIP connection to the MOS threshold value and will display "OK", if the current MOS value is at least as good as the MOS threshold value - or "FAIL" - if it is not. Range: 1.0 to 5.0 Default: *4.0*	

Value	5	4	3	2	1
Voice quality	excellent	good	fair	poor	bad

The MOS value determined here is the MOS_{CQE} (Conversational Quality Estimated). This value can be strongly influenced by the codec used.

Profile name	Enter or change the name of the edited VoIP profile

VoIP QoS (Quality of Service)		
Layer 3 DiffServ	Differentiated Services: Classification/Prioritization of IP packets (L3)	
RTP (ToS/DSCP)	ToS	Type of Service Field used to set the prioritization in the IP header of the user data (RTP), for more infomation, see page 122. Range: 0 to 0xFF Default setting: *18*
	DCSP	Differentiated Services Codepoint Field used to set the prioritization in the DS field (6 bits) of the user data (RTP), for more information, see page 122. Range: 0 to 0x3F Default setting: *00*
SIP (ToS/DSCP)	ToS	Type of Service Field used to set the prioritization in the IP header of the SIP data (signaling), for more information, see page 122. Range: 0 to 0xFF Default setting: *18*
	DCSP	Differentiated Services Codepoint Field used to set the prioritization in the DS field (bits) of the SIP data (signaling), for more information, see. page 122. Range: 0 to 0x3F Default setting: *00*
Layer 2 VLAN prio	The VLAN prioritization on Layer 2 (L2) is an extension of the Ethernet header.	
RTP VLAN prio	VLAN prioritization of user data (RTP). Range: 0 to 7 Default setting: *0*	
SIP VLAN prio	VLAN prioritization of SIP data (signaling). Range: 0 to 7 Default setting: *0*	

16.1 Start VoIP Telephony

(Example: ADSL access already active)

Set up the service.

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

<Edit> The default Virtual Line profile will be opened for editing.

If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).

<Info> Duration of the activation

<Test> Open test selection

<Stop> Deactivate service

e.g. select VoIP call

VoIP dest. 02/10

00492351907090
●87

Edit

Mark VoIP destination
(default is marked with a ●).

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

<Edit>   Open the VoIP destination
              number for editing

Initialization

Set up a connection

VoIP call

Connecting!
From:7087
To: 87

CALL

Status   Volume

The ARGUS will display its "own call
number" (From: 7087) and the subscriber
number called (To: 87). The subscriber
called has not yet accepted the call:
display shows "Connecting!" and a yellow
"CALL" icon.

VoIP call

Connected!
 0:00:07
MOS:4.3
 Good
G.711 Alaw
From:7087
To: 87

OK

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
(see page 161) - i.e. will display "OK" or
"Fail". The ARGUS will also show the
evaluation of the MOS value in
accordance with ITU-T P.800 (in this
example, "Good"). Furthermore, it will
display the duration of the connection and
the currently used voice codec (in this
example, G.711 A-law, see page 160).

<Info>   Display of the VoIP parameters.

<Status>   Display the Status screen
               without stopping the test; see
               page 166.

<Volume>   Opens the volume setting.

Continuation on
next page

Continuation on next page,
second screenshot.

```
Volume
─────────────────────────────
VoIP intern:
  quiet----------loud
               ▲




─────────────────────────────
          Extern
```

Setting the volume:

\<Extern\> Headset operation

\<Intern\> Handset operation

\<OK\> Settings confirmed

\<Info\>
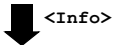
```
MOS info
─────────────────────────────
MOS G.107
─────────────────────────────
Current              4.3
Average              4.3
Minimum              3.1
Maximum              4.3
Ideal                4.3

─────────────────────────────
                     RTP
```

Display MOS info:

- Current MOS
- Average MOS
- Min./max. MOS value
- Ideal MOS (MOS possible without interference, depends on Codec) Current and average
- R-Factor in accordance with ITU-T G.107

❌ Return to the previous display.

Display of the other VoIP results:

Packet statistics:

```
RTP info
─────────────────────────────
Packets
─────────────────────────────
Received             401
Sent                 399

Error counter
─────────────────────────────
RTP drop               0
RTP error              0
─────────────────────────────
                     RTCP
```

- Packets received (Rx)
- Packets sent (Tx)
- Error counters:
  RTP drop
  RTP error
- RTP jitter Rx:
  Current jitter
  Average jitter
  Minimum jitter
  Maximum jitter
- RTP packets lost (Rx)
  (total, current, average, min. and max.)

❌ Return to "outgoing call"

Continuation on
next page

Content of RTCP

RTP jitter far	[ms]
Current	0
Average	0
Minimum	0
Maximum	0

Codec

Content of RTCP
Display of the statistics sent by the link partner:
- Current jitter at the link partner (remote end) Rx (far)
- Average jitter far (remote end)
- Maximum and minimum jitter at the link partner
- RTP packets lost at the link partner Rx (far): Total, current, average, min. and max.
- Network delay calculated from the RTCP packet transfer time: current, average, min., and max.

If the message "no data" is displayed, RTCP is not supported by the link partner (remote end).

The ARGUS will display the codecs supported by the link partner.

Codec info

G.711 ulaw
G.723.1
G.711 Alaw

MOS

Open the "outgoing call" display

<MOS> Return to the "MOS info" display.

Display the Status screen without stopping the test.

or

<Status> In ARGUS Status, see page 164.

Profile 1

| Data | VoIP | IPTV | VoD |

ADSL ATU-R Anx A(2+)
kb/s: 25367/ 1256
CRC: 0/ 18687
U: -0.4V

Info

ARGUS - Status screen.
The VoIP service still has a test active (indicated by the green "hammer" icon).

Use the cursor keys to select VoIP service

Profile 1

Data	VoIP	IPTV	VoD

ADSL ATU-R Anx A(2+)
kb/s: 25367/ 1256
CRC: 0/ 18687
U: -0.4V

Info   Test

<Test>   Display the results summary

<Info> or   Display the VoIP call
             parameters.

The ARGUS will display how long the
VoIP service has been active, as well as
the user name and protocol used.

VoIP service

Active: 0:00:51
VoIP Profil 1

Protocol	SIP
ID	7087

Log.   SIP

<SIP>   Display the registration details:
           Status codes, register IP, register
           used, Outbound Proxy/SBC and
           URI used etc.

<Log.>   Displays the VoIP service SIP
           commands, see page 168.

VoIP service

Register state
      Registered
SIP code
      OK
Registrar
      10 .0 .0 .5
Received registrar

The ARGUS shows the registration
details before, during and after the
connection. The setting "Use Registrar"
must be set to "yes" for this purpose.

```
VoIP service
> SIP register

< Code:401
Unauthorized
> SIP register

< Code:200
                    Time
```

The ARGUS will display the VoIP service SIP commands.

Other info ((see chapter G) VoIP SIP status codes page 223).

<Time> Appends a timestamp to all events.

```
VoIP service
> SIP register
  10:43:00:000
< Code:401
  10:43:00:000
> SIP register
  10:43:00:000
< Code:200
```

⚠️ The timestamp is based on the internal system clock of the ARGUS, see page 203

Incoming call:

```
Incom. Voip call

          Incoming cal
          From:87
   📞     To:  7087
  CALL


 Reject              Accept
```

The ARGUS can be called while VoIP service is active. An incoming call will be indicated with yellow Call icon. The incoming call can be accepted or rejected. To have incoming calls accepted automatically, start the "VoIP wait" test, see page 171.

<Reject> Reject call.
Switch to the Status screen.

<Accept> Accept call.
Open the ARGUS-State.

VoIP Features at a Glance

During and after a successful registration:

	`Display` / Meaning
`SIP Log`	Log showing the SIP methods exchanged and status codes.
`Register state`	The ARGUS shows all of the important registration and registrar info in the Register State Display.

During a call or a connection:

	`Display` / Meaning
`MOS value, Voice codec`	Current `MOS value`, current `voice` codec used.
`SIP Log:`	Log showing the SIP methods exchanged and status codes.
`INFO: MOS results:`	`Threshold:` Shows whether the value stayed within the preconfigured MOS threshold. `P.800:` Evaluation in accordance with ITU-T P.800 `MOS value:` current/average/min./max. `R factor:` current/average/min./ideal
`INFO: RTP results:`	`RTP packets:` received / sent `RTP drop:` RTP packets received but discarded by the jitter buffer. `RTP error:` RTP packets received but defective. `RTP jitter Rx:` current / average / min. / max. *(calculated in accordance with RFC 3550 per sec.)* `RTP packet loss Rx:` current / average / minimum / maximum in percent `RTP packet loss total number:` *(RTP packets not received)*
`INFO: RTCP results:` *(The content of the RTCP packets will be displayed if this is supported by the remote end.)*	`RTP jitter remote end:` current / average / minimum / maximum `RTP Packet Loss - remote end:` current / average / minimum / maximum in percent `RTP packet loss - remote end` `Total number` `Network delay:` current / average / minimum / maximum *(Calculated on the basis of RTCP packets exchanged)*

16.2 VoIP Wait

When running the "VoIP Wait" test, the ARGUS behaves like a VoIP telephone.
To run the "VoIP Wait" test, the parameters for "VoIP call" (see page page 158) and "VoIP Wait" must be configured:
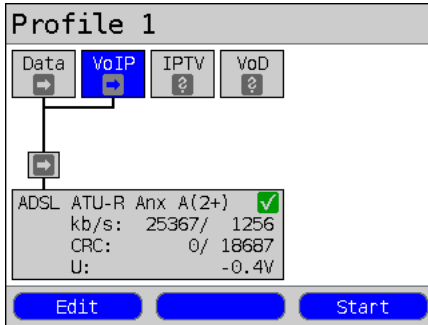
Set up the service.

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

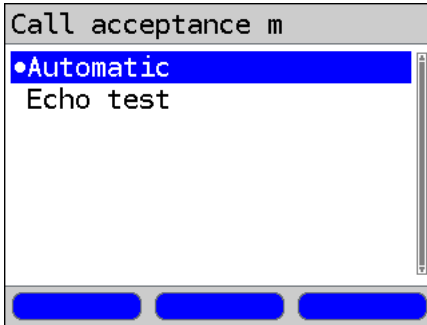**<Edit>** The default (preset) Virtual Line profile will open for editing.
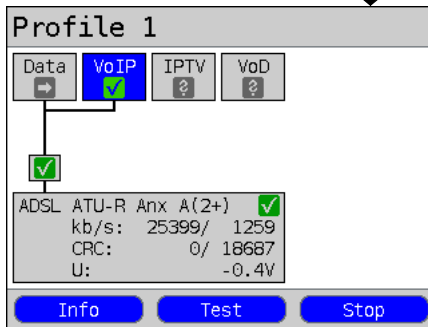
If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).
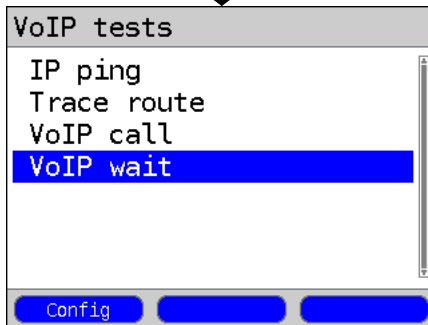
<Config> Opens the call accept mode for "VoIP wait".

```
Call acceptance m
●Automatic
 Echo test
```

The "VoIP wait" test supports

- Automatic
- Echo test
Default setting: *Automatic*

⚠ The ARGUS will use the user name entered under the SIP parameters as its own number, see page 158.

Start VoIP wait

```
Profile 1
Data  VoIP  IPTV  VoD
 ➡    ☑    ?    ?

      ☑

ADSL ATU-R Anx A(2+)  ☑
  kb/s: 25399/ 1259
  CRC:     0/ 18687
  U:         -0.4V
  Info    Test    Stop
```
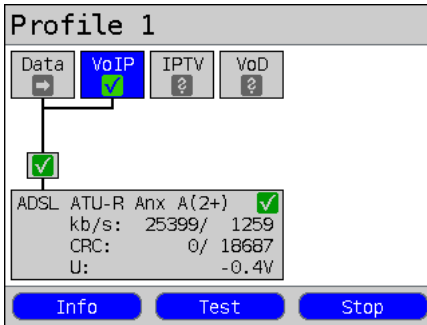
The VoIP service and the ADSL connection are active.

```
VoIP tests
 IP ping
 Trace route
 VoIP call
 VoIP wait

  Config
```

Select "VoIP wait"

```
Initialization
```

Continuation on next page

```
VoIP wait
Awaiting  call...
```

```
      Status
```
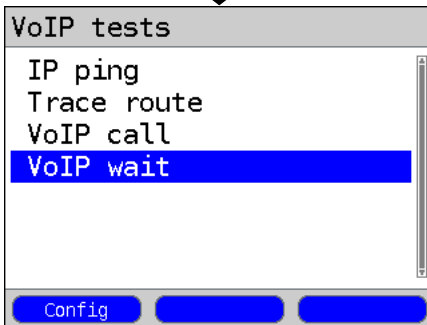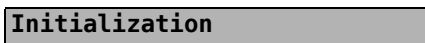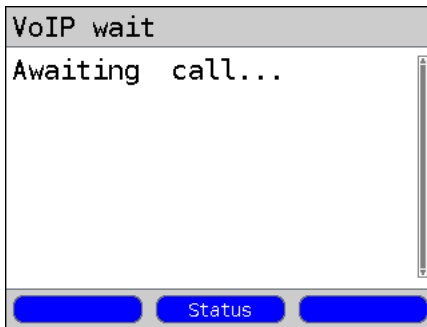
The ARGUS will wait for a VoIP call.

<Status>   Open ARGUS Status, see

```
VoIP wait
         Connected!
          0:00:04
  OK     MOS:4.3
          Good
         G.711 Alaw
         From:87
         To:  7087
  Info     Status    Volume
```
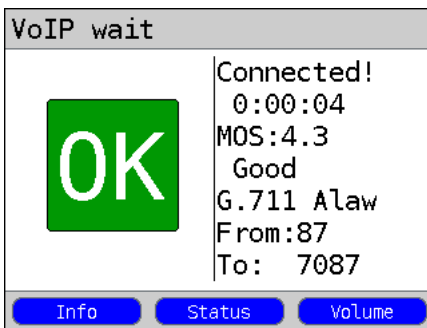
The ARGUS will accept the call (see
setting) automatically.

The call (connection) parameters are
explained in the section on VoIP calls, see

Call clearing:

The connection is cleared down in the same manner as it is after an IP ping.
However, pressing the "Cancel" key once will only clear down the connection (if
there is one). The ARGUS will remain registered with the registrar (VoIP service
active) so the ARGUS can still be called (an incoming call can be rejected or
accepted). Deactivate the VoIP service to clear the registration with the registrar.
In this case, the existing connection will, however, not be cleared down.

17 IPTV Tests

17.1 IPTV

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:
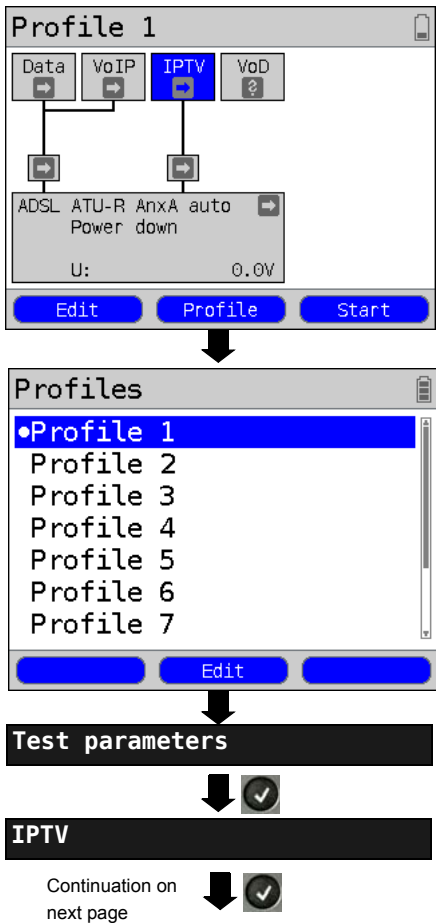
ARGUS - Status screen.

The IPTV-STB emulation is performed using the "IPTV" service.
The following example shows the procedure and considers its special aspects.

<Edit>   Assign Virtual LinesVirtual Lines to the IPTV service.

<Profile>   Profile settings are like those for ADSL, see page 30.

<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.

```
IPTV
Channel selection
 IGMP version
 Thresholds
```

View and edit the
marked parameters if
necessary

Setting	Explanation
Test parameters:	
`IPTV:`	`<Edit>` The selected profile will be opened for editing.
`Channel selection`	The channel list can be used and edited for all profiles. Up to 250 channels can be created. A configuration can also be conveniently prepared using the WINplus software on a PC. Selection of the TV test channels for the IPTV test: `<Edit>` The channel is opened for editing.
`Multicast IP`	Entry of the multicast IP. Range: 0.0.0.0 to 255.255.255.255 Default setting: *224.0.0.0*
`Port`	Entry of the port Range: 0 to 65535 Default setting: *0*
`Alias name`	Entry of a station name for the IPTV channel
`IGMP version`	Version of the management protocol to log on/off of a multicast group. Range: 2 to 3 Default setting: *3*
`Threshold`	Setting of the threshold values for the IPTV test. If these values are exceeded during the IPTV test, the test will display the assessment "FAIL"; otherwise "OK" will be displayed. If an "*" is entered, the corresponding threshold will not be checked.

`PCR jitter`	Setting the threshold values for PCR jitter. Range 0 to 2 000 ms Default setting: *8 ms*
`Total RTP loss ratio`	Setting of the threshold value for the RTP loss ratio for the entire test. Range: 0.00% to 100.00% Default setting: *5.00%*

17.1.1 Multiple Virtual Lines

The ARGUS can use up to 4 Virtual Lines for the IPTV service. In this case, the IGMP VL is used for the transport of the IGMP protocol and Virtual Lines 1 to 3 are used to receive the video/audio streams.

The selected Virtual Line Profile in overview.
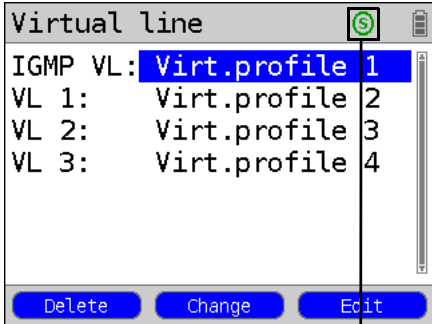
<Delete>	Remove the selected virtual profile (in this example, Virt. Profile 1) from the list.
<Change>	The selected virtual profile (in this example, Virt. Profile 1) will be replaced by the newly selected virtual profile.
<Edit>	Edit the selected virtual profile (in this example, Virt. Profile 1), see page 89.

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

Set up the service.

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

Profile 1

Data | VoIP | IPTV | VoD

ADSL ATU-R Anx A(2+) ✓
kb/s: 25367/ 1256
CRC: 0/ 18687
U: -0.4V

Edit | | Start

\<Edit\> Assign a Virtual Line to the IPTV service or edit it.

Activate the IPTV service.

Profile 1

Data | VoIP | IPTV | VoD
✓

✓

ADSL ATU-R Anx A(2+) ✓
kb/s: 25367/ 1256
CRC: 0/ 18687
U: -0.4V

Info | Test | Stop

If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).

\<Info\> Duration of the activation

\<Test\> Open test selection

\<Stop\> Deactivate service

IPTV tests

IP ping
Trace route
IPTV
IPTV scan
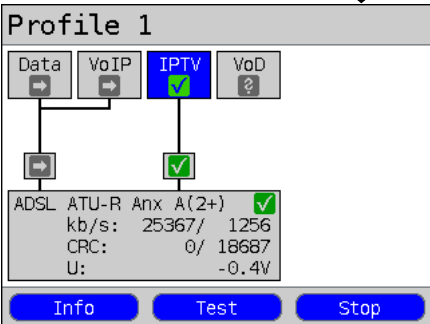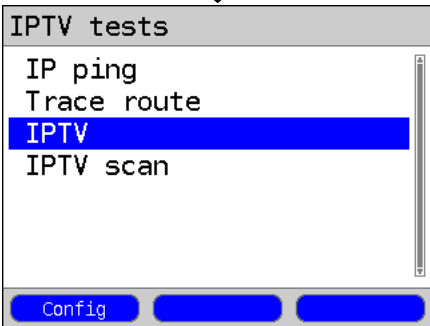
Config | |

\<Config\> Display the IPTV configuration, see page 174.

Continuation on next page ✓

IPTV channel

•ARD HD
 ZDF HD
 WDR
 IPTV Kanal 4
 IPTV Kanal 5
 IPTV Kanal 6
 IPTV Kanal 7
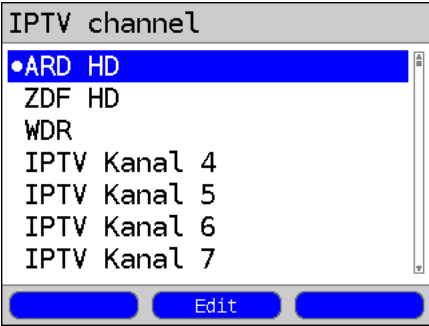
Edit

Select the IPTV channel
(the default profile is marked with a ●).

\<Edit\>   Edit the marked channel,
             For information on changing
             the individual parameters, see
             page 174.

Initialization

The IPTV test will start automatically.

IPTV test
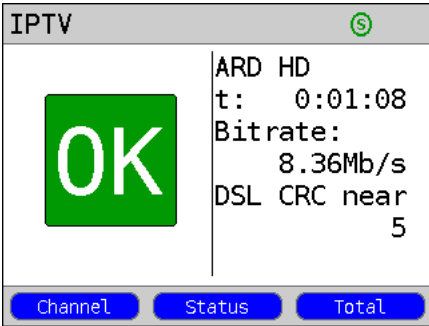
IPTV   ⓢ

          ARD HD
          t: 0:01:08
 OK   Bitrate:
              8.36Mb/s
          DSL CRC near
                     5

Channel   Status   Total

During the test, the ARGUS displays the
selected IPTV channel, the duration of the
test and the current bitrate. If the
measured values exceed the threshold
limits in the settings, the ARGUS will
report that the IPTV test failed (FAIL);
otherwise it will display "OK". The ARGUS
will continue to display "FAIL" until the
measured value returns to a value less
than the limit value once again.

\<Channel\> Select a new channel

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

\<Total\>   Display all of the IPTV statistics.

❌   Cancel the test.

Continuation on
next page

```
IPTV overview
RTP bitrate       8.88Mb/s
RTP losses              0
RTP loss ratio      0.00%

DSL CRC n/f      0|      0
[          ][          ][ Detail ]
```

Display:

- Current RTP-bitrate
- Number of packets lost during the test
- Display the packet loss ratio as a percentage

<Detail> Open the IPTV details

```
IPTV info
Channel            ARD HD
Duration          0:01:55
IP         239. 35. 10.  1
Port               10000

DSL CRC n/f      0|      0
[          ][          ][  RTP  ]
```

Display:

- Display the selected station name
- Display the test duration
- Display the IP address of the station
- Display the port of the station
- Display the DSL-CRC error counter (not on Ethernet), see page 39.

<Detail> Open the RTP details

```
IPTV RTP
Bitrate           8.26Mb/s
Packets             164137
Losses                   0
Loss ratio 1s        0.00%
Loss ratio           0.00%

DSL CRC n/f      0|      0
[          ][          ][ MPEG2 ]
```

Display:

- Current bitrate
- Current number of RTP packets
- Number of packets lost during the test
- Display the packet loss ratio in 1 s as a percentage
- Display the packet loss ratio as a percentage
- Display the DSL-CRC error counter (not on Ethernet), see page 39.

<MPEG2> Open the MPEG2 details, see page 179.

Continuation on
next page

```
┌──────────────────────────────────┐
│ IPTV MPEG2                       │
├──────────────────────────────────┤
│ CC error                   0     │
│                                  │
│                                  │
│                                  │
│                                  │
│                                  │
│ DSL CRC n/f       0│       0     │
├──────────────────────────────────┤
│           │          │   Info    │
└──────────────────────────────────┘
```

Display:
- Total CC error
- Display the DSL-CRC error counter (n/f)

<Info> Open the IPTV info

Stop the IPTV test ▼ ⊗

IPTV results

```
┌──────────────────────────────────┐
│ IPTV                             │
├──────────────────────────────────┤
│ Total bitrate                    │
│ Minimum          7.08Mb/s        │
│ Maximum          9.17Mb/s        │
│ Average          8.71Mb/s        │
│                                  │
│                                  │
│                                  │
├──────────────────────────────────┤
│           │  Status  │  Detail   │
└──────────────────────────────────┘
```

Display:
- Display the minimum bitrate in Mbit/s
- Display the maximum bitrate in Mbit/s
- Display the average bitrate in Mbit/s

```
┌──────────────────────────────────┐
│ IPTV                             │
├──────────────────────────────────┤
│ RTP loss ratio         0.00%     │
│                                  │
│                                  │
│                                  │
│                                  │
│                                  │
│                                  │
├──────────────────────────────────┤
│           │  Status  │  Detail   │
└──────────────────────────────────┘
```

Display:
- Display RTP loss ratio as a percentage

Close the results display

For information on saving the results, see IP Ping page 126.
For information on sending the trace file to a PC (see page 126).

⊗

Save the result?

17.2 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:
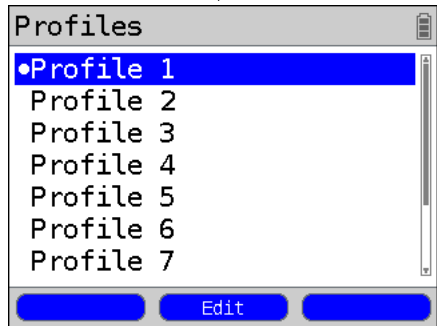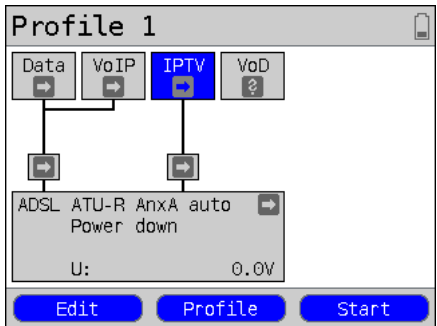
ARGUS - Status screen.

<Edit>   Assign Virtual Lines to the IPTV service.

<Profile>   Profile settings are like those for ADSL, see page 30.

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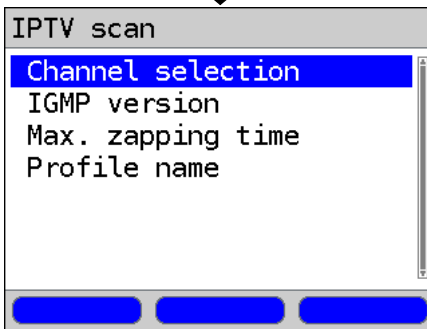
The ARGUS will use the marked profile as the default profile and return to the Settings menu.

IPTV scan profile

•Scan profile 1
 Scan profile 2
 Scan profile 3

Edit

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

Edit the marked Scan profile.

IPTV scan

Channel selection
IGMP version
Max. zapping time
Profile name

View and edit the marked
parameters if necessary

IPTV Scan settings:

Setting	Explanation
Test parameters:	
`IPTV scan:`	Up to 3 user-defined Scan profiles can be created. `<Edit>` The selected profile will be opened for editing.
`Channel selection`	The channel list can be used and edited for all profiles. Up to 250 channels can be created. A configuration can also be conveniently prepared using the WINplus software on a PC. Selection of the TV test channels for the IPTV scan:
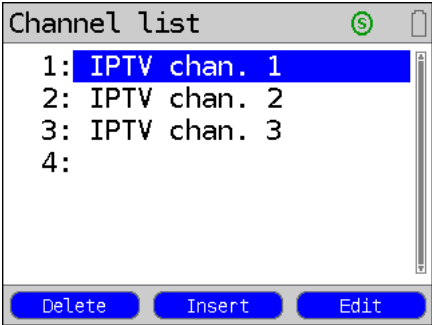
The ARGUS will first display the TV channels that have already been selected in the order that they will be tested in an IPTV scan. If no channels have been select so far, the list will initially be empty. The places in the list can be filled one after the other. Up to 250 channels can be selected.

`<Insert>` A list of the available channels will open.
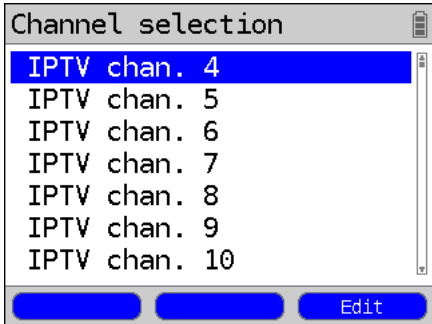
Mark the channels. Channels, which have already been selected, will no longer appear in the channel list (see Display Channel selection).

`<Edit>` Open marked channel for editing:
- Enter the address (multicast IP and port number) of the TV channel
- Enter any alias name desired for the TV channel (e.g. station name).

Continuation on next page

Channel list

1:	IPTV chan. 4
2:	IPTV chan. 1
3:	IPTV chan. 2
4:	IPTV chan. 3
5:	

Delete   **Insert**   **Edit**

Add the selected TV channel (in the example, IPTV channel 4) to the Channel selection and then add the next channel (in the example, IPTV channel 5).

If two or more channels have been added to the list, their order can be changed using the following softkeys:

<Delete>   Delete the marked TV channel from the list.

<Insert>   Open the channel list showing the channels available.

Continuation on next page

Switch between softkey sets

Channel list

1:	IPTV chan. 4
2:	IPTV chan. 1
3:	IPTV chan. 2
4:	IPTV chan. 3
5:	

↓   **Insert**

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

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

Accept channel selection in the order shown

IGMP version	Version of the management protocol to log on/off of a multicast group (broadcast TV only). Range: 2 to 3 Default setting: *3*

Max. zapping time	Enter the zapping time (IPTV timeout): The zapping time is the period of time that elapses between requesting and receiving a IPTV channel. If the measure zapping time exceeds the value entered here, the ARGUS will consider the test to have failed and will display the message "Failed". Range: 1 to 25 seconds Default setting: ***5 seconds***
Profile name	Entry of a name for the IPTV scan profile

Start the IPTV Scan
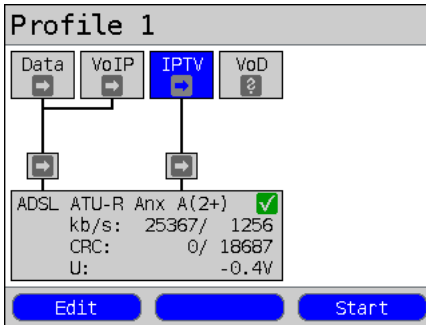
Set up the service.

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

**\<Edit\>**   Assign a Virtual Line to the IPTV service or edit it.
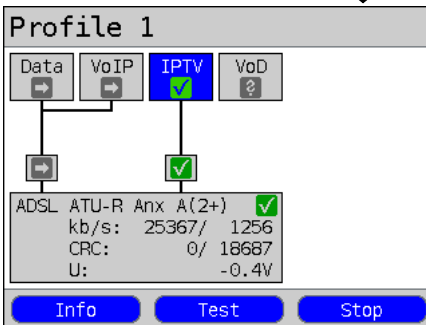
Activate the IPTV service.

If no xDSL connection has been setup, a connection will be setup automatically at this point using the default profile (see page 36).

\<Info\>   Duration of the activation

\<Test\>   Open test selection

\<Stop\>   Deactivate service
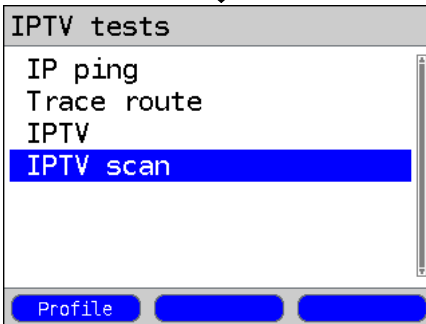
\<Profile\>   Display the IPTV scan profile, see page 181.

Continuation on next page

IPTV Scan

The IPTV scan will start automatically.

```
IPTV scan
Zapping time        [ms]
ARD HD                 0
ZDF HD               242
WDR                   26
Minimum                0
Maximum              242
Average               89
          Status
```

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 (see page 184), the ARGUS will display "Failed".

Display of the minimum, maximum and average zapping time.

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

Close the results display.

For information on saving the results, see IP ping page 126.
For information on sending the trace file to a PC (see page 126).

Save the result?

17.3 IPTV Passive

The ARGUS listens for TV channels without requesting one.
If the ARGUS detects TV channels, it will display a list of multicast IPs or channel names.
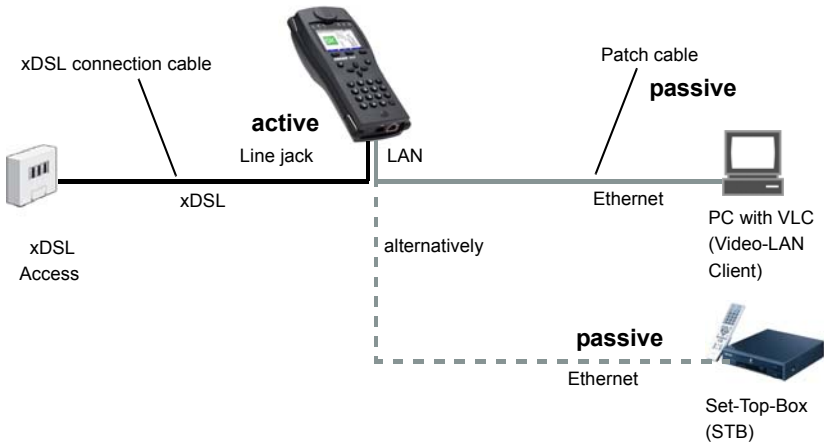
⚠️ Instead of a PC or STB, you can also connect a second ARGUS in STB mode.

For more on protocol-independent parameters and test parameter settings for the IPTV passive test, see page 173 f.

Start IPTV passive

	Set up the service.

Set up the service.

The profile used to set up the xDSL connection (in this example, Profile 1) will also be used for the IPTV passive test.
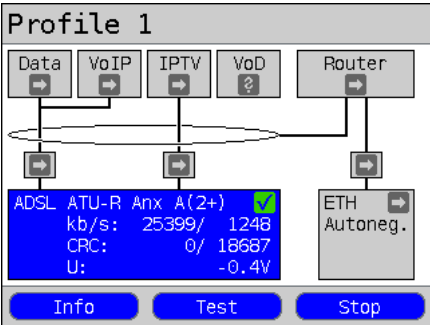
Use the cursor to select and activate the router.
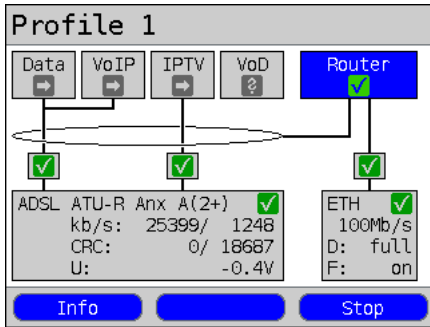
Router mode started.

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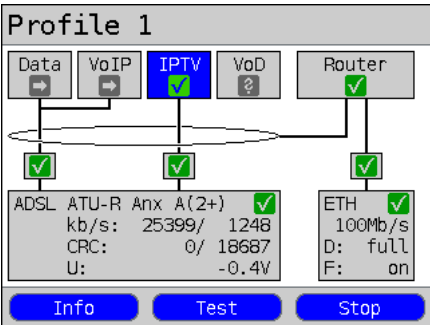
The IPTV service and Router mode are active and the ADSL connection is synchronous.

IPTV tests

IP ping
Trace route
IPTV
IPTV scan
IPTV passive

Config
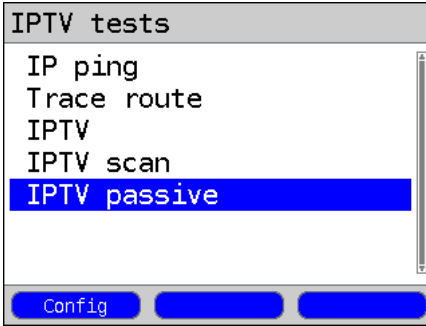
<Profile>   Display the IPTV passive
settings, see page 174.

IPTV

ARD HD
ZDF HD
WDR

Refresh   Status   IP
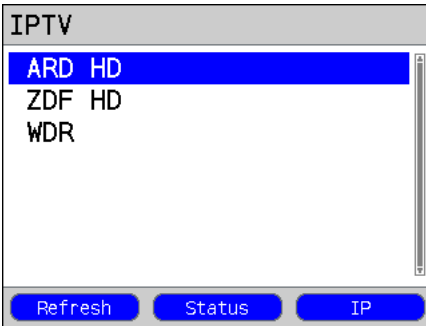
The ARGUS will automatically check
whether IPTV streams are available and
display those that are.

In this example, 3 streams are displayed.

<Refresh>   Refresh the channel list

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

<IP>   Display the multicast IP of the
selected channel.

Waiting for stream

IPTV

OK

ARD HD
t: 0:00:22
Bitrate:
    9.02Mb/s
DSL CRC near
    0

Channel   Status   Total

During the test, the ARGUS displays the
selected IPTV channel, the duration of the
test and the current bitrate. If the
measured values exceed the threshold
limits in the settings, the ARGUS will
report that the IPTV test failed (FAIL);
otherwise it will display "OK". The ARGUS
will continue to display "FAIL" until the
measured value returns to a value less
than the limit value once again.

<Channel> Select a different available channel.

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

<Total>   Display all of the IPTV statistics.
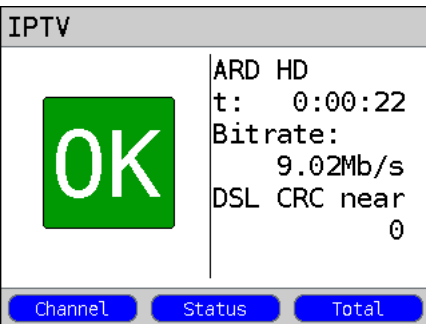
   Cancel the test.

18 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.

18.1 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 200 VDC or 100 VAC$_{pp}$.**

18.1.1 Start DMT Analysis

| Access | ARGUS - Main Menu |

⬇️ ✔️

| Copper Tests | Select Copper Tests |

⬇️ ✔️

ARGUS status	ARGUS State Display
Copper tests 2 wire	Any DC voltage on the line will be displayed.
0.0 v	

| Config | Menu | Start |

<Config> For information on changing the DMT Analysis settings, see page 193.

<Menu> Open the Main Menu.

<Start> Open the Single Tests Menu directly
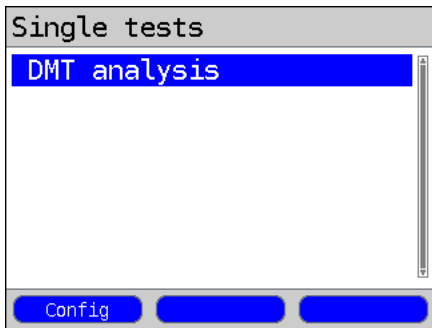
Select DMT Analysis:

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

Continuation on next page

Mode of operation in the DMT Analysis:
The DMT Analysis can be operated in the following mode:

Low-impedance   Input impedance: 100 Ω

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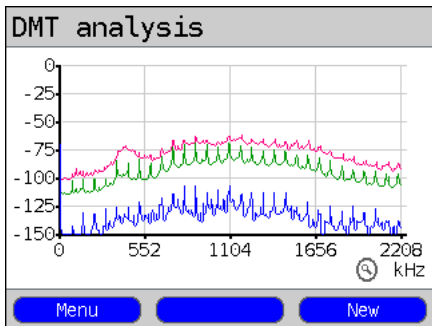
In the case of permanent interference (see the display in the example), one might find that the source is RF from a defective plug-in power supply coupled to the idle line.

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

<Menu>   Open the Graphic functions, see page 194.

<New>   Starts a new recording.

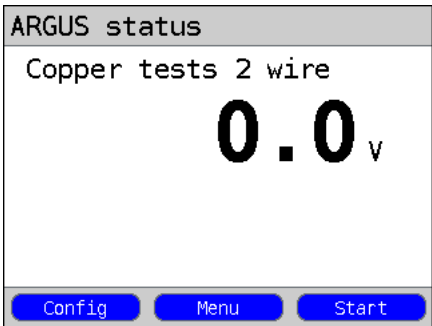**DMT Analysis ARGUS State Display**
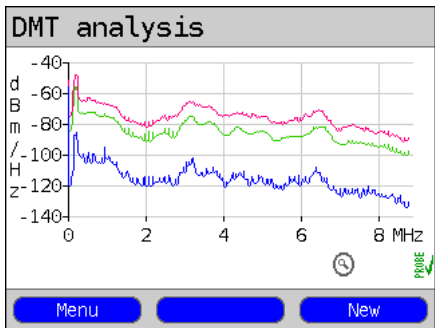
A DMT Analysis is not performed in real-time. Once the DMT Analysis has been started from the "Single Tests" Menu, it will record (depending on the presets - in this example the mode "All") one after the other the average (green), the peak/maximum (red) and the bottom/minimum (blue) signal traces for the duration of the measurement.

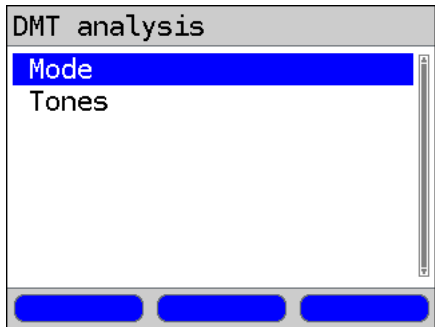The results are presented in the form of a graph. A new measurement will first be done after the **<New>** softkey is pressed.

<New> Start a new measurement

or (any previous recordings will be lost).

The settings - determining the conditions under which the DMT Analysis will record something - can be configured before a test is performed.

ARGUS State Display

<Config> Change the DMT Analysis settings.

<Menu> Open the Main Menu.

<Start> Open the Single Tests Menu directly

Preset the
 - Mode
 - Tones

Edit the marked parameters if necessary

Setting	Explanation
DMT Analysis:	
Mode	The mode can be used to set which signal trace in the graph should be recorded by the DMT Analysis. Choose between: - Average measurement: Shows the mean value measured during the measurement time set (Frames: 128, Time: 250 ms), shown in green in the graph - Peak measurement: Shows the peak value measured during the measurement time set (Frames: 2048, Time: ca. 4 s), for each carrier frequency in red in the graph - Bottom (minimum) measurement: Shows the minimum value measured during the measurement time set (Frames: 2048, Time: ca. 4 s), for each carrier frequency in blue in the graph - All (Average, Peak and Bottom will be recorded) Default setting: ***Average***
Tones	The frequency range to be recorded is determined using the Tones setting. The DMT Analysis can record a maximum frequency range of 130 kHZ to 30 MHz. In such case, the resolution is the usual tone interval, i.e. 4.3125 kHz, with a precision of ±1%. The power measurement range is fixed at -140 to -40 dBm/Hz. It cannot be changed. The following selected frequency ranges can be preset for measurements on a DSL line: - 1.1 MHz (ADSL), 130 kHz to 1.1 MHz - 2.2 MHz (ADSL2+), 130 kHz to 2.2 MHz - 8.8 MHz (VDSL2 8a), 130 kHz to 8.8 MHz - 17.6 MHz (VDSL2 17a), 130 kHz to 17.6 MHz - 30.0 MHz (VDSL2 30a), 130 kHz to 30.0 MHz Default setting: ***1.1 MHz (ADSL)***

18.1.2 Graphic functions

DMT Analysis State Display
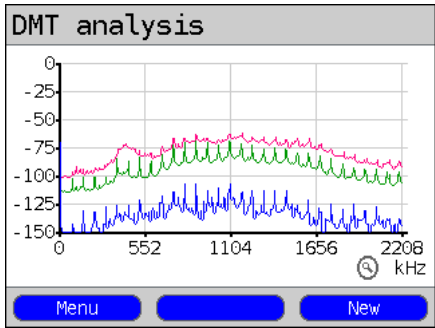
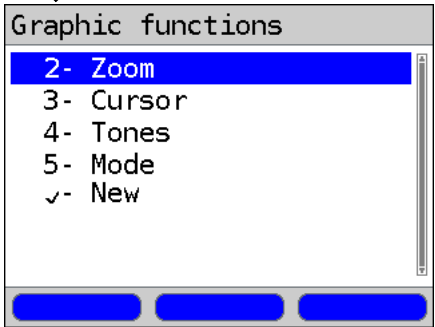The graphic functions like Zoom and Cursor allow detailed analysis of the graphs.

<New>
or

Start a new recording (any previous recordings are lost).

<Menu>   Open Graphic functions.

⚠️ To save the results and quit the DMT Analysis press the ⊗ -key in the State Display (i.e. the display showing the graph).

The Graphic functions menu will open.

⊗   Exit menu without making changes

2   Using these numeric keys the Zoom function can also be activated within a graph.

3   The Cursor function is described on page 195.

✓   Confirms the selection and returns to the graph.

Zoom:
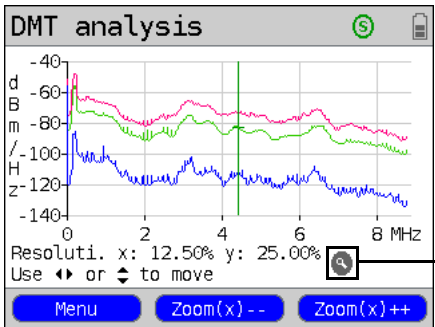
The magnifying glass is shown in the display on a gray background. Zoom is active. If the magnifying glass is shown in the display on a white background, Zoom is not active.

<Zoom(x)-->   Enlarges the central section of the graph (100 %)

**<Zoom(x)++>**   Not yet zoomed. Deactivates **<Zoom(x)++>** and ceases enlargement.

Using the ⇧ it is possible to switch the function of the softkeys and select either x-axis zoom or y-axis zoom, see page 44 and page 44.

Cursor:
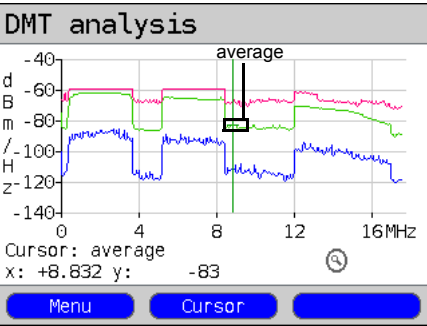
Once the Cursor function is started, a green Cursor line will be displayed in the middle of the graphic.

<Cursor> Using the Cursor softkey, it is possible to switch the cursor on or off as needed once it has been activated from the menu. By default the Cursor will be first placed on the middle trace (green, "average") in the graph. Pressing the softkey again will move the Cursor to the maximum trace (red, "peak") and when pressed again to the minimum trace (blue, "bottom") in the graph.
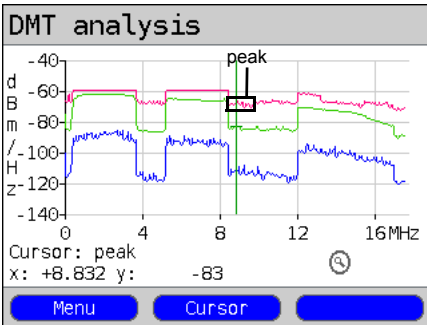
The value of the graph at the cursor's current position will be displayed below the graph (first example) as follows:

x: +8.832 MHz (precision: ±1 %)

y: -83 dBm/Hz (precision: ±2 %)

Using the "left" and "right" cursor keys, the cursor can be moved to any location in the graph to measure it. Briefly tapping the cursor key will move the Cursor one position further in the graph. The Cursor will move in ever larger steps if you press and hold the cursor key down.

The Zoom and Cursor functions can also be used in combination. As an example it is easier to measure a specific point in a graph with the Cursor function if you have first Zoomed in on the area. The zoomed area will not necessarily be centered on the Cursor.

Tones:

Tones
1.1MHz (ADSL)
● 2.2MHz (ADSL2+)
8.8MHz (VDSL2 8a)
17.6MHz (VDSL2 17a)
30.0MHz (VDSL2 30a)

Set the frequency range (see page 193).

⚠ The smaller the frequency range, the faster the DMT Analysis will be performed.

Open the Tones menu

Mode:

Mode
Average
Peak
Bottom
●All

Set the signal traces to be displayed (see page 193).

⚠ The fewer the traces to be recorded, the shorter the recording time.

Open the Mode menu.

ARGUS 141

19 Test Results

The saved test reports can be viewed either on the ARGUS display or on a PC. The test data can be sent to a Windows PC, where - using the WINplus software - it is possible to generate - among other things - a comprehensive test report.

The ARGUS saves the test results together with the date and the time (ARGUS internal clock, see page 203) in one of the 50 sequentially numbered (1, 2, 3, etc.) memory locations. The ARGUS will suggest "AMP_x" as a name where the "x" in this case represents the current memory location. If all the settings are reset, the test results that have been saved will also be deleted. The functions ("View", "Test data to PC", "Delete") in the Test results menu refer to a test result. Therefore, a window will open first showing a list of the reports saved.
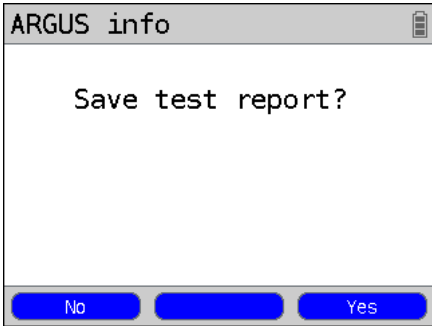
Test results

ARGUS - Main Menu.

Test results
1 AMP_1
2 empty
3 empty
4 empty
5 empty
6 empty
7 empty
Date
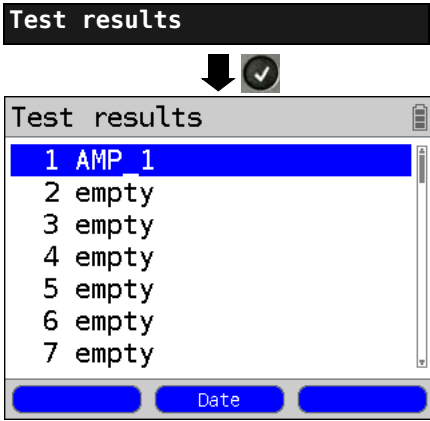
The ARGUS will display for each memory location the corresponding name of the memory location as well as the date and time. Empty memory locations are labeled as "empty".

\<Date\>   The date and time that the results were saved will be displayed. The **\<Name\>** softkey will also be displayed.

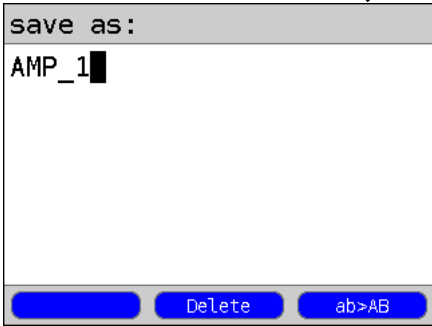**\<Name\>**   Display the name of the memory location.

19.1 Saving Test Reports

```
┌─────────────────────────────────┐
│ ARGUS info                    ▯ │
├─────────────────────────────────┤
│                                 │
│     Save test report?           │
│                                 │
│                                 │
│                                 │
│                                 │
│                                 │
│  ┌────────┐ ┌────────┐ ┌──────┐ │
│  │  No    │ │        │ │ Yes  │ │
│  └────────┘ └────────┘ └──────┘ │
└─────────────────────────────────┘
```

The results of a test can be saved when a test is completed or when a connection is cleared down.

The ARGUS saves the test result in the first available memory location. If the memory is full, you must manually select a memory location to be overwritten.

As names for the memory locations, the ARGUS will suggest either AMP_1, AMP_2, AMP_3 etc.

```
┌─────────────────────────────────┐
│ save as:                        │
├─────────────────────────────────┤
│ AMP_1█                          │
│                                 │
│                                 │
│                                 │
│                                 │
│                                 │
│  ┌────────┐ ┌────────┐ ┌──────┐ │
│  │        │ │ Delete │ │ab>AB │ │
│  └────────┘ └────────┘ └──────┘ │
└─────────────────────────────────┘
```

The name shown can accepted or a new one can be entered using the keypad. When the right softkey is pressed, it assumes a different meaning and thus influences the entries made from the keypad. Up to 24 characters can be entered.

<12>ab>   Entry of the digits 0 to 9 plus * and #

<ab>AB>   Entry of lowercase characters (e.g. to enter a "c" press the "2" on the keypad three times), plus @, /, -, and .

<AB>12>   Entry of the uppercase characters and @, /,- and .

<Delete>   Delete the character before the cursor
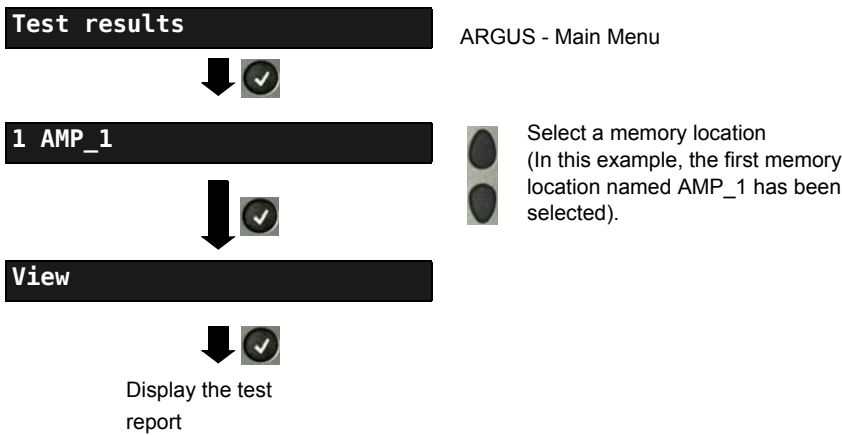
Move the cursor

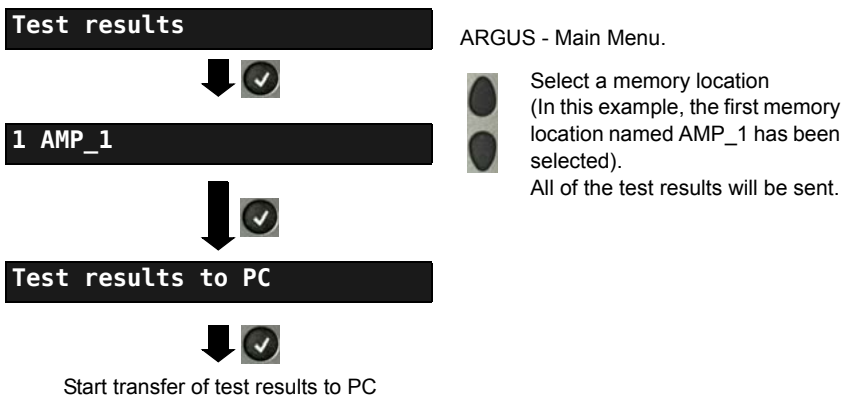Do not save the results; return to the previous display.

Store the result

19.2 Displaying the Saved Test Reports

Test results

ARGUS - Main Menu

1 AMP_1

Select a memory location
(In this example, the first memory
location named AMP_1 has been
selected).
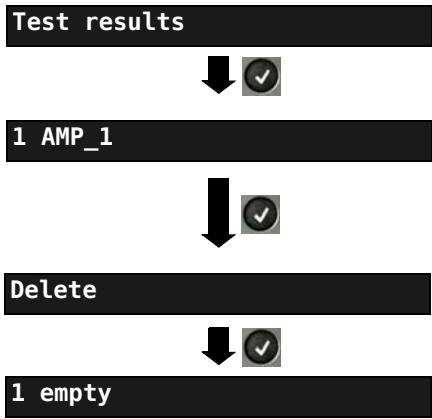

View

Display the test
report

19.3 Test Results – Sending to a PC

The test results can be sent to a PC, where they can be visualized and archived. Use the included USB cable to connect the ARGUS (ARGUS "USB-B" jack) to a USB jack on your PC and then start WINplus on your PC.

Test results

ARGUS - Main Menu.

Select a memory location
(In this example, the first memory
location named AMP_1 has been
selected).
All of the test results will be sent.

1 AMP_1

Test results to PC

Start transfer of test results to PC

19.4 Test results – Deleting

Test results

ARGUS - Main Menu

1 AMP_1

Select a memory location
(In this example, the first memory
location named AMP_1 has been
selected).

Delete

Delete the test report stored in the
selected memory location.

1 empty

The memory location will again be
marked as "empty".

For information on how to delete all test
results, see on page 207 "Reset Settings
to Factory Settings".

19.5 Send All Test Results to a PC

The ARGUS sends all of the saved test results to the PC. Connect the ARGUS to your PC
and start WINplus on the PC.

Test results

ARGUS - Main Menu

1 AMP_1
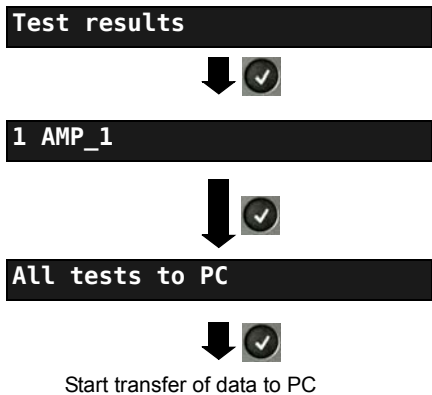
Select one of the stored test
reports (in this example, the test
results stored in the memory
location named AMP_1).

All tests to PC

Start transfer of data to PC

ARGUS 141

19.6 Delete All Test Reports

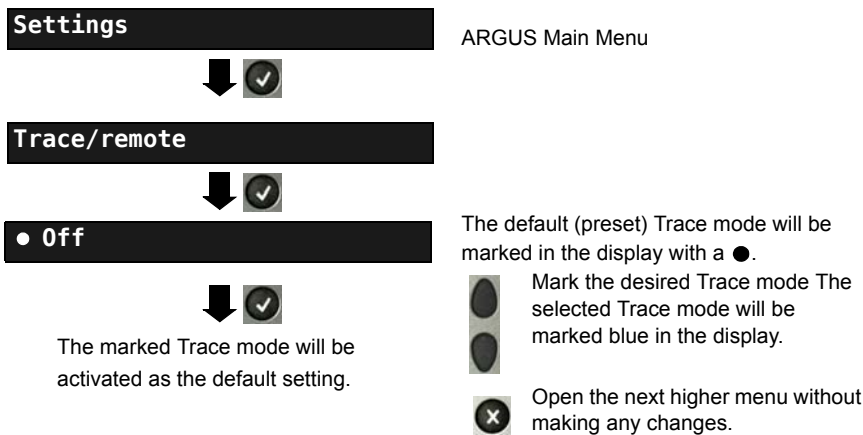The ARGUS will delete all of the test reports stored in the internal memory.

Test results

Select one of the memory locations with stored test results (in this example, the memory location named AMP_1).

1 AMP_1

Delete all

Press **<Yes>** to confirm that you really do want to delete all of the 50 possible test reports.

20 ARGUS Settings

The ARGUS can be configured to suit special requirements. The default (factory) settings can be restored by selecting "Reset" (see page 207).

20.1 Trace/remote

The ARGUS passes the recorded data online directly to the connected PC.

Settings

ARGUS Main Menu

Trace/remote

● Off

The default (preset) Trace mode will be marked in the display with a ●.

Mark the desired Trace mode The selected Trace mode will be marked blue in the display.

The marked Trace mode will be activated as the default setting.

Open the next higher menu without making any changes.

Off	Basically, the data will not be sent to the PC. Default setting: ***off***
Auto PC sync.	All data will always be sent to the PC ("PC" LED will flash). This setting remains active even after the ARGUS is switched on again.
Manual PC sync.	Data will be sent to the PC until the ARGUS is switched off (the "PC" LED will flash). When the ARGUS is switched off and then back on again, Trace mode will be off.

If the ARGUS cannot send the data to the PC without errors, the "PC" LED will flash at 5Hz (5 times per sec).

20.2 Device Settings

The procedure for configuring a device setting will be illustrated with a single example: "Alarm bell".

Settings

ARGUS - Main Menu

Device

Alarm bell

Using the cursor keys, select a setting (e.g. Alarm bell).

The default setting will be marked in the display with a ●.

● Off

Mark the desired setting. The selected setting will be marked blue in the display.

The marked setting will be activated as the default setting.

Open the next higher menu without making any changes to the settings.

Setting	Explanation
Menu language	Selection of the menu language. Default setting: ***depends on country***
LCD lightness	Setting the display contrast: The contrast can be changed in 16 steps. The contrast can be increased or decreased using the cursor keys. The display shows a vertical arrow, which shows the current setting on a scale from low to high contrast.
Date / Time	Entry of the date and time (initialisation of the internal clock) via the keypad. Use the vertical cursor keys to scroll from line to line in the display. The entered time will be continuously updated by the ARGUS's real time clock as long as the power is not interrupted. If the ARGUS switched off without batteries, the clock will still run a few more days on its own internal supply. If the backup supply is exhausted, the time will be undefined and must be set again.

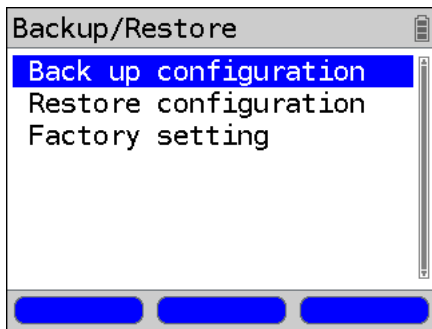|	
`Ringer volume`	With this setting you can set the volume level used by the ARGUS to signal an incoming call. The initial volume level can be set. - Default setting: *Level 1* (very quiet) In addition, you can also set the end volume level. - Default setting: *Level 7* (very loud) When an incoming call is received, the ARGUS will begin signalling with the initial (very low) volume and increase the volume by one increment each time it signals until it has reached the final (very loud) volume.
`Alarm bell`	The ARGUS signals with an audible alarm in a variety of situations, e.g. when a bit error occurs in a BERT or the ARGUS has synchronized on an xDSL access or when an error counter increments. <table><tr><td>short - long</td><td>Synchronized successfully</td></tr><tr><td>long - short</td><td>Synchronization lost</td></tr><tr><td>short - short</td><td>Error counter incremented (The alarm refers to the last second only. Only one alarm is signalled even if there were several errors.)</td></tr></table> When this setting is set to "off", all audible alarms are suppressed. Default setting: *off*
`Jingle`	After the tester is switched on and has initialized, it will indicate its readiness by sounding the ARGUS jingle. Default setting: *off*
`Power management`	Switch off automatically: Set how long the ARGUS can remain idle before the power management will switch to power down mode if the ARGUS is not connected to the plug-in power supply. If power management is disabled, the ARGUS will display a message, when it is switched on, warning that this will lead to a shorter battery life. This notice can be deactivated by pressing the "X"-key. By pressing <on>, you can reactivate this notice. Default setting: *after 5 minutes* Lighting: Sets how long the background lighting will remain on. When operated from the mains power, the background lighting will always remain on. When operating from the battery pack, the ARGUS switch off the background lighting after the set time. Default setting: *off after 30 seconds*
`Software option`	Enabling a software option the associated key code must be entered via the keypad. Additional ARGUS options can be enabled if desired by entering the associated 20-place code on the keypad. To obtain this code, please contact us.

20.3 Settings − Backup / Restore

The ARGUS can backup and when needed restore all of its settings (PPP user name, PPP password, IP addresses, profile names, etc.).
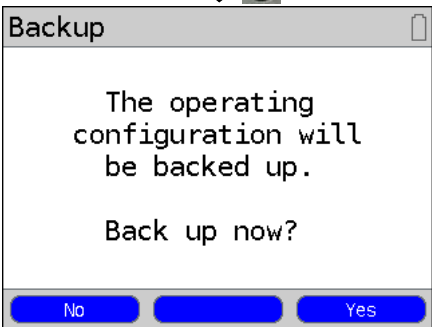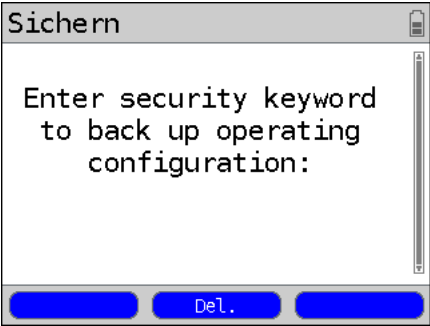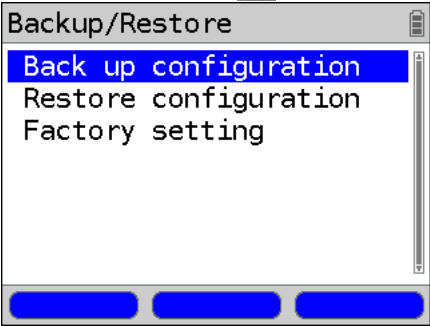
Saving settings

```
Settings
```

⬇ ✓   ARGUS - Main Menu

```
Backup/Restore
```

⬇ ✓

```
Backup/Restore                    ▮
 Back up configuration
 Restore configuration
 Factory setting
```

All of the ARGUS settings made will be backup and can thus be restored at a later time.

⬇ ✓

```
Backup                            ▯

        The operating
     configuration will
       be backed up.

       Back up now?

  No              Yes
```

⬇

```
Sichern                      ▯

  Enter security keyword
   to back up operating
      configuration:



          Del.
```

⚠ To backup or restore the settings, you must first enter the safety key.
To request the safety key, contact your support (sales partner) or intec directly (see page 8).

```
Backup/Restore               ▯
 Back up configuration
 Restore configuration
 Factory setting
```

The settings can now be backed up and restored again later should this be needed.

Restoring settings

```
Backup/Restore               ▯
 Back up configuration
 Restore configuration
 Factory setting
```
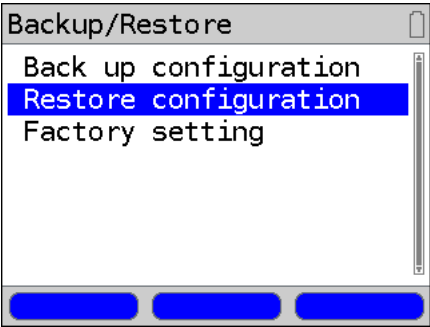
Select Restore settings.

⊡ and ② Restore the backed up settings.

⚠ If no settings have been saved, this function has the same effect as "Resetting to Factory Settings", see page 207. The saferty key is not required.

```
Restore now?
```
<Yes>

The backed up configuration will now be restored.

20.4 Reset Settings to Factory Settings

The ARGUS will reset all settings to the original factory settings.

⚠ The speed-dialling memory with the call numbers, PPP user name, PPP password, IP addresses, profile names and all of the test results stored in the ARGUS will be deleted.

Settings

⬇ ✓

Backup/Restore

⬇ ✓

Backup/Restore 🔋

Back up configuration
Restore configuration
Factory setting
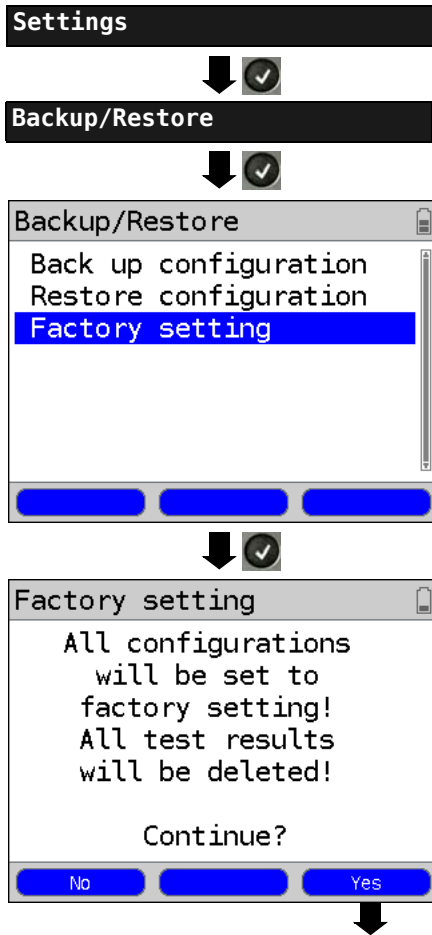
All settings will be reset to their factory settings.

⬇ ✓

Factory setting 🔋

All configurations
will be set to
factory setting!
All test results
will be deleted!

Continue?

No ☐ Yes

⬇

The following steps are performed in the same manner as in "Back up configuration", see page 205.

✳ and 3 The ARGUS will immediately display the security warning query "All settings will be reset to the factory settings! All test results will be deleted! Reset now?"

⚠ Please contact your support (sales partner) or intec directly for the safety key (see page 8).

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 battery) or trickle charged (default setting: on) 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 the service life of a battery pack, if it is to be stored over a longer period of time, it should not be exposed to temperatures in excess of +50 °C (95 °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 9).

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 battery". If you press and hold the power switch, the ARGUS will switch off before the battery pack is recharged. The ARGUS remains on after fully recharging the battery pack.

Charge battery

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 blink, when there is still approximately (depending on the mode of operation) 8 minutes reserve. During this period, it is possible that there may be audible interference and in rare cases even malfunctions. Connect the power supply.
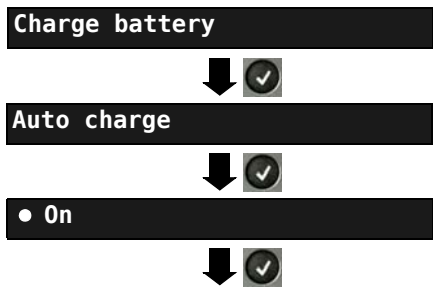
When the plug-in power supply is connected, the battery pack in the ARGUS can be fully recharged. It is not necessary to manually discharge the lithium-ion accumulators in the ARGUS battery pack. It may take up to 6 hours to fully recharge the battery pack.
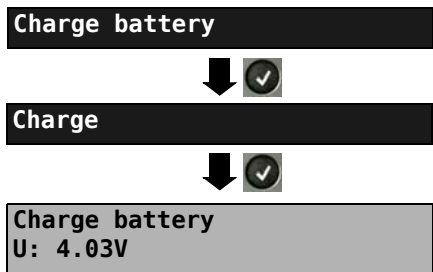
Charge battery	ARGUS Main Menu
⬇ ✓	
Charge	Connect the power supply!
⬇ ✓	The charging process begins.
Charge battery **U: 4.03V**	The ARGUS will display the voltage while charging the battery pack.

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

Charge battery	ARGUS Main Menu
⬇ ✓	
Auto charge	
⬇ ✓	If the battery voltage is too low, the ARGUS will charge the battery pack automatically in the background when the plug-in power supply is connected (battery symbol shown on the display).
● **On**	
⬇ ✓	
The ARGUS uses this setting and returns to the next higher menu.	

⚠ 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/service free-of-charge and save it on your PC to later transfer to your ARGUS tester.
Open the Internet site www.argus.info:

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

After this page opens, click on "Downloads" in the "Service" column on the left.
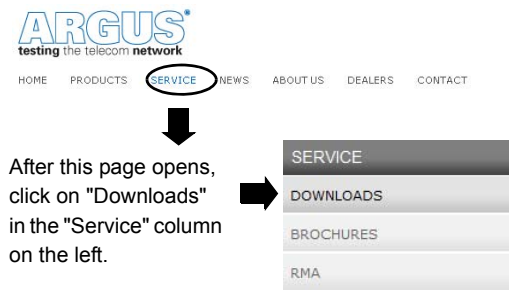
This will open the product list:

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.

After you have selected the required variant, a browser window will open to permit you to select the location where the firmware should saved on your PC. The remaining steps are explained in the WINplus 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 reports on a PC 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.

23 Appendix

A) Acronyms

	Characters
Ω	Ohm (electrical resistance)
	A
A	Ampere (unit of electrical current)
AC	Alternating Current or also an abbreviation for ACcess server
ADSL	Asymmetric Digital Subscriber Line
AMP	ARGUS measurement report
ANSI	American National Standards Institute
Anx.	Annex
ASCII	American Standard Code for Information Interchange.
ATM	Asynchronous Transfer Mode
ATU-R	ADSL Transceiver Unit - Remote
Auto-MDI-X	Automatic Medium Dependent Interface Crossing
Avg	Average
	B
BR	Bridge
BRAS	Broadband Remote Access Server
	C
C	Celsius
c_0	Speed of light
CO	Central Office
CRC	Cyclic Redundancy Check
	D
dB	Decibel
dBm/Hz	Unit of power referenced to 1 mW (milliwatt) per Hertz
DC	Direct Current
DHCP	Dynamic Host Configuration Protocol
diffserv	Differentiated Services
DIN	Deutsches Institut für Normung e. V. (the German Institute for Standardization)
DL	Download
DMT	Discrete Multitone Transmission
DNS	Domain Name System
DPBO	Downstream Power Back Off
DS	Downstream band
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer

	E
e.g.	Example
EU	European Union
ElektroG	Elektro- und Elektronikgerätegesetz (German Electrical and Electronic Equipment Act)
EMV	Electromagnetic Compatibility
EN	European Norm
EoA	Ethernet over ATM
ete	end-to-end
ETH	Ethernet
ETSI	European Telecommunications Standards Institute
	F
FEC	Forward Error Correction
FS	Feature Set
FTP	File Transfer Protocol
FW	Firmware
	H
h	hour
HDB3	High Density Bipolar of order 3
HEC	Header Error Checksum
HEX	Hexadecimal
HLOG	Amplitude component of the transfer function for each tone
HTTP	Hyper-Text Transfer Protocol
Hz	Hertz (unit of frequency - 1 cycle per second)
	I
i. e.	in example
IAD	Integrated Access Device
ID	Identifier
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
INP	Impulse Noise Protection
IP	Internet Protocol
IPCP	Internet Protocol Control Protocol
IPoA	Internet Protocol over ATM
IPoE	Internet Protocol over Ethernet
IPTV	Internet Protocol Television
ISO	International Standard Organization
ISP	Internet Service Provider
ITU	International Telecommunication Union
	K
KB	Kilobyte

Kbit/s	Kilobits per second
	L
L1	Layer 1 in the OSI reference model
L2	Layer 2 in the OSI reference model
L3	Layer 3 in the OSI reference model
LAN	Local Area Network
LCD	Liquid Crystal Display
LCP	Link Control Protocol
LED	Light-Emitting Diode
LOS	Loss of Synchronization
	M
m	meter
MAC	Media Access Control
MB	Megabyte
Mbit/s	Megabit per second
MDI	Media Delivery Index (RFC 4445)
MLR	Media Loss Rate
min.	minute
Modem	Modulator/Demodulator
MOS	Mean Opinion Score
MPEG	Moving Picture Experts Group
MTU	Maximum Transmission Unit
mVpp	millivolt peak-to-peak
	N
n/a	not available
n/r	not received
n/u	not used
NAT	Network Address Translation
NGN	Next Generation Network
NTBA	Network Termination for ISDN Basic rate Access
	O
OAM	Operations, Administration and Maintenance
OoS	Out of Sequence (OOS)
OSI	Open Systems Interconnection
	P
PADI	PPPoE Active Discovery Initiation
PADO	PPPoE Active Discovery Offer
PADR	PPPoE Active Discovery Request
PADS	PPPoE Active Discovery Session confirmation
PADT	PPPoE Active Discovery Termination
PAP	Password Authentication Protocol

PC	Personal Computer
PCR	Program Clock Reference
PDU	Protocol Data Unit
PID	Packet Identifier
POTS	Plain old telephone service (PSTN - public switched telephone network)
P-P	Point-to-point
P-MP	Point-to-multipoint
PPP	Point-to-Point Protocol
PPPoA	Point-to-Point Protocol over ATM
PPPoE	Point-to-Point Protocol over Ethernet
PPTP	Point-to-Point Tunneling Protocol
PSD	Power Spectral Density
PSI	Program Specific Information
PWR	Power
	Q
QLN	Quiet Line Noise
QoS	Quality of service
	R
RC	Resistance (R) and capacitance (C)
RFC	Request for Comments
RJ	Registered Jack (standardized jack)
RoHS	Restriction of Hazardous Substances
RT	Router
RTCP	Real-Time Control Protocol
RTP	Real-Time Transport Protocol
RTSP	Real-Time Streaming Protocol
Rx	Receive
	S
s	second
SBC	Session Border Controller - Outbound Proxy
SIP	Session Initiation Protocol
SNR	Signal-to-Noise-Ratio
SNRM	Signal-to-Noise-Ratio Margin
STB	Set-Top Box
STUN	Session Traversal Utilities for NAT
	T
T	Trigger
TCP	Transmission Control Protocol
TE	TErminal, Terminal Equipment
TM	Test Manager
ToN	Type of Number

ToS	Type of Service
TS	Technical Specification
TTX	Teletext
Tx	Transmit
	U
UDP	User Datagram Protocol
UL	Upload
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
US	VDSL: Upstream band
USB	Universal Serial Bus
	V
V	Volt (unit of electrical voltage)
VC	Virtual Channel
VCC	Virtual Channel Connection
VCI	Virtual Channel Identifier
VC-MUX	Virtual Circuit Multiplexing
VDSL	Very High Speed Digital Subscriber Line
VLAN	Virtual Local Area Network
VL	Virtual Line
VLC	Video LAN Client
VoD	Video on Demand
VoIP	Voice over Internet Protocol
VPI	Virtual Path Identifier
V$_{pp}$	Volt peak-to-peak
VTU-R	VDSL Transceiver Unit - Remote
	W
WAN	Wide Area Network
WEEE	Waste Electrical and Electronic Equipment
	X
xDSL	Collective term for different DSL variants
xTU-C	xDSL Transceiver Unit - Central Office
xTU-R	xDSL Transceiver Unit - Remote
	Z
Z	Impedance

B) Vendor identification numbers

Abbreviation	Manufacturer
ALCB	Alcatel (STMicroelectronics)
ANDV	Analog Devices
BDCM	Broadcom
GSPN	Globespan
IKNS	Ikanos
IFTN	Infineon
META	Metanoia
STMI	STMicroelectronics
TSTS	Texas Instruments

C) Error message: PPP connection

ARGUS Display	Description
External fault:	
`Negotiation err`	Cannot negotiate the network protocol for PPPD, so the remote site is not reachable.
`Idle release`	Connection was terminated, since there was no activity.
`Time out rel`	Connection was terminated, since the maximum connection time elapsed.
`PPP: Echo req. error`	Remote site did not answer echo requests so the connection has been terminated. (PPP connections are tested at regular intervals by sending echo requests to the remote site.)
`Hanging up rel`	Disconnected by remote site.
`Loopback erro`	The setup of the PPP connection was cancelled, since a loopback was detected.
`Authent. Error`	Authentication error: Wrong user name or password - rejected by remote site.
`PADO timeout`	No PADO packets received.
`PADS timeout`	No PADO packets received.

D) Error message: Download test

ARGUS Display	Description
External fault:	
`Http redir.error`	Fault: Too many HTTP redirects.
`http: no response`	No answer from HTTP server.
`Http serv.error`	HTTP server has returned an error. (for details see the table below "HTTP Error Messages")
`Http encod.error`	Due to an encoding problem, data transfer with HTTP is not possible.
`Ftp open error`	Error when opening the FTP connection.
`Ftp login error`	FTP login error. Wrong user name or password or anonymous login not supported.
`Ftp passiv err.`	FTP server does not support passive transmission mode.
`Ftp rec. error`	FTP receive error.
`Network error`	Network error
`Ftp error`	General FTP error.
`URL error`	Fault: No HTTP or FTP URL specified.
`Socket error 2`	Error when connecting a socket. The server's HTTP service is not available.
`Http Head.error`	Error in the header of the requested HTTP file.
`Ftp no file`	FTP download error: No such file or directory found.
`Unknown address`	Unknown host address. Possible cause: Error in the address entered, DNS resolution not working or network not accessible.
`Unknown download error`	Unknown download error

E) HTTP status codes:

Display on ARGUS: Code No.	Meaning
100	Client should continue its request.
101	The protocol is being changed at the Client's request.
200	The Client's request has succeeded.
201	The Client's request that a new document be created was successful.
202	The Client's request has been accepted for processing.
203	The Client's request will be answered with information from a source other than the server.
204	The Client's request was successful. The server sends [no content] only the HTTP header.
205	The Client's request was successful. The server [resets content] sends a new HTTP body.
206	The Client's request was successful. The server sends only part of the requested document [partial content].
300	The request was not precise enough so multiple documents have been returned.
303	The requested resource has been found at a different URI and should be retrieved from there.
304	The requested document has not been changed in the interim.
305	The requested document must be retrieved from a proxy instead of from the server.
307	The requested resource has been temporarily relocated to a different URI [temporary redirect].
400	Syntax error in the Client's request [Client error].
401	The request requires user authentication.
402	Payment is required to process this request.
403	The Client's request has been refused. (e.g. because authentication failed.)
404	The requested document was not found (e.g. because of an error in the URL entered or while the document is no longer available).
405	The method specified by the Client in its request is not allowed by the server.
406	The requested document in a format that is not supported by the Client.
407	The request requires that the Client authenticate itself with a proxy.

408	The Client did not place its request within the time allowed by the server [Request Timeout].
409	Due to a conflict (e.g.another request) the Client's request cannot be completed by the server.
410	The requested URL is [gone] no longer available on the server.
411	The Client sent data to the server without a defined Content Length.
412	The preconditions in the Client's request could not be satisfied by the server.
413	The Client's request has been refused by the server because the request entity is too large.
414	The Client sent a URL to the server that is too large (e.g. because of the form values contained).
415	The Client's data is not supported by the server.
416	The range (in a document) requested by the Client does not exist.
417	The server could not (or did not wish to) satisfy the Client's expectation given in the Expect request header field.
424	Due to a failed dependency, the requested document will not be sent by the server.
500	Due to an unexpected condition, the server cannot fulfill the Client's request (e.g. faulty configuration, missing or wrong CGI program).
501	The server does not support the function required to fulfill the Client's request.
502	The server received an invalid response from an upstream server or proxy which it accessed in attempting to fulfill the request.
503	The server is currently unable to handle the request due to a temporary overloading of the server.
504	The Client's request (of a gateway or proxy) did not receive a response within the specified time.
505	The server does not support the HTTP protocol version that was used in the Client's request.

F) General Error Messages

Display on ARGUS	Description
`Prot. not supp.`	The protocol (IP, PPPoE, etc.) is not supported in the selected mode.
`Unknown error`	Unknown error occurred.
`No PPP connec.`	No PPP connection can be setup.
`Test aborted`	Test aborted by user.
`Ping start error`	Error when starting the Ping test.
`Fault: PPP con-nection`	Unexpected termination of the PPP connection.
`Unexp. PING end`	Unexpected termination of the Ping test.

G) VoIP SIP status codes

SIP requests:

The six basic requests / methods:

INVITE   Invite a user to a session (call - initiates a session)

ACK   Acknowledge an INVITE request

BYE   Terminate a session (hangup)

CANCEL   Terminates the setup of a connection

REGISTER Provides data regarding subscriber availability (host name and IP address)

OPTIONS   Supplies information regarding the functions supported by the other SIP telephone

SIP responses:

SIP responses are answers to SIP requests. There are six basic types of SIP responses with numerous sub-responses:

1xx   Informational responses (180 indicates for example that the phone of the party called is ringing)

2xx   Reports that the request has been successful

3xx   Redirection responses

4xx   Client failure responses

5xx   Server failure responses

6xx   Global failure responses

Display on ARGUS: Code No.	Meaning	Explanation
100	Trying	The ARGUS is attempting to setup a call.
180	Ringing	The phone at the other end is ringing.
181	Call Being Forwarded	The call is being forwarded.
182	Call Queued	The call is in a wait loop.
183	Session Progress	The call is being setup.
200	OK	Everything is all right.
202	Accepted	Connection has been accepted.

300	Multiple Choices	There is no unique destination address for the remote end. Please select one.
301	Moved Permanently	Calls are being permanently forwarded.
302	Moved Temporarily	Calls are being temporarily forwarded.
305	Use Proxy	A proxy must be used.
380	Alternative Service	Alternative service
400	Bad Request	The request is not OK.
401	Unauthorized	You are not authorized.
402	Payment Required	Payment is required.
403	Forbidden	This is not permitted.
404	Not Found	The remote end was not found or does not exist.
405	Method Not Allowed	The method (e.g. SUBSCRIBE or NOTIFY) is not permitted.
406	Not Acceptable	The options used in the call are not supported.
407	Proxy Authentication Required	The proxy must be authenticated.
408	Request Timeout	The time for the request has been exceeded (timeout).
409	Conflict	There is a conflict.
410	Gone	The subscriber is no longer reachable here.
411	Length Required	The length must be supplied.
413	Request Entity Too Large	The values are too long.
414	Request URI Too Long	The URI is too long. (Destination address)
415	Unsupported Media Type	The codec is not supported.
416	Unsupported URI Scheme	The URI scheme is not supported. (Destination address)
420	Bad Extension	The extension is wrong.
421	Extension Required	An extension is necessary.
423	Interval Too Brief	There is a problem with the SIP parameters. (Register Expire is too short)
480	Temporarily Unavailable	The subscriber is currently not reachable.
481	Call/Transaction Does Not Exist	This connection does not exist (any longer).
482	Loop Detected	A redirection loop has been detected.
483	Too Many Hops	Too many redirects.
484	Address Incomplete	The SIP address is incomplete or faulty.
485	Ambiguous	The SIP address is not unique.
486	Busy Here	The destination is busy.
487	Request Terminated	The request has been terminated.
488	Not Acceptable Here	The call cannot be accepted.
491	Request Pending	A request is waiting.

493	Undecipherable	Decryption error.
500	Server Internal Error	Internal error in the server.
501	Not Implemented	The requested method (functionality) has not been implemented.
502	Bad Gateway	The gateway is bad.
503	Service Unavailable	The service is not available.
504	Server Time-Out	The gateway did not respond in time.
505	Version Not Supported	The SIP protocol version is not supported.
513	Message Too Large	The message length is too long. Use TCP.
600	Busy Everywhere	All terminals are busy at the remote end.
603	Declined	The system at the remote end refused to accept the call.
604	Does Not Exist Anywhere	This user does not exist any longer.
605	Not Acceptable	SIP request not acceptable.

H) Software Licenses

The ARGUS firmware includes code from what are known as Open Source packages, which have been published under various licenses (GPL, LGPL, MIT, BSD, etc.).

Additional information can be found – if requested in your order – on the CD-ROM included in the package (see Software_License.htm) or can be viewed at

http://www.argus.info/web/download/Software_License.

In the event that you are interested in the sources licensed under GPL or LGPL, please contact support@argus.info. A machine-readable copy of the source code can be obtained from intec Gesellschaft für Informationstechnik mbH for a minimal fee - to cover the cost of physically copying the code. This offer is valid for 3 years.

I) Index

A

B

C

D

E

F

U

V