ARGUS10 Manual

Version: 3.0

Contents

1 Introduction

ARGUS tests the operation of an ISDN-BRI, a U-interface and an analog access.

The ARGUS Flash-ROM technology permits the user to download future protocol changes or new functions from a PC into the ARGUS.

If you use the ARGUS on a BRI interface in an ISDN system whose specifications deviate from the (DIN ETS 300 102) standard (e.g. some networked PBXs), you must take these manufacturer-specific modifications into account. In such cases, please contact the distributor of your ISDN PBX for assistance.

The ARGUS Functions - Overview:

- **Protocol Recognition and B-Channel Test**

After you select the operation mode, the ARGUS will automatically determine the protocol used by the access under test and will then test the availability of the B-channels.

- **Telephone connections**

Can a telephone call be placed from this access to every other number and/or can this access receive a call?

- **Service Tests**

Does the tested access support connections with the most important services, such as, ISDN telephone service, Group 4 - Facsimile or datatransmission at 64 kbit/s etc.?

- **Bit error tests (BERT)**

Performs a BERT in an extended call to itself via a loopbox or in end-to-end operation. The ARGUS will, if needed, handle the loopbox function itself.

- **Supplementary Services**

ARGUS automatically tests the supplementary services made available by the exchange.

- **Tests leased lines (permanent circuits) with BERT**

and speech

- **NT simulation of a BRI- access**

- **D-channel monitoring on the Basic- Rate Interfaces**

All of the D-channel signals are captured and passed to the serial or infrared interface.

When passively monitoring, the ARGUS does not affect Layer 1.

- **Analog (a/b) Functionality**

Does the analog access support call number transfer?

The ARGUS will display the charges, if the access supports this feature.

- **Monitoring an analog line (passive listening-in)**

- **Line Test**

Checks the terminating resistors for the cabling of a four-wire bus.

Detects cabling problems (e.g. broken wires, short-circuits or crossed wires).

- **The Access Acceptance Report**

When the ARGUS is linked to a PC via the serial or infrared interface, it is, as an example, possible to create and print a comprehensive test report on the PC.

- **Testing Features with the Keypad**

Manual test possibilities in the so-called keypad mode. If the network supports this feature, the user can send a command sequence and can then test the service features in a dialog.

Should you have any further questions, please contact us:

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2 Safety Notices

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.

- To prevent electrical shocks or damage to the ARGUS, do not connect it to lines with voltages in excess of 100 V!

- Never attempt a measurement with the case open!

- The ARGUS is not watertight. Protect the ARGUS from exposure to water!

- Before replacing the battery (see page 13 Changing the batteries), disconnect all the test leads and switch the ARGUS off.
  Make certain that the polarity is correct when connecting the batteries!

3 Technical Data

Dimensions / Weight	Inputs / Outputs
Height 229 mm	1 RJ45 for S_{Bus} (BRI), U-Interface or analog
Width 72 mm	
Depth 35 mm	1 jack for an external power supply
Weight 350 g (without batteries and protective case)	
Keypad	1 RJ45 for Line test and serial transfer
21 Keys	
	IrDa Interface
LCD display	
LCD display with switchable background lighting	**Temperature Ranges**
4 lines with 16 characters	Ambient-temperature: 0 °C to +50 °C
	Operating temperature:
Memory	-5 °C to +55 °C
EEPROM Non-volatile memory: 2048 Byte	
Flash program memory: 1 Mbyte	**Power Supply**
	3 AA (Mignons)
S-RAM: 128 Kbytes	or
	9 V, plug-in power supply
	or
	BRI feed

4 Operation

IrDa Interface

Receiver inset

LEDs

```
ARGUS3U 1.50
B12      Level OK
S0 P-MP TE DSS1
   Menu RESTART
```

LCD display
4x16 characters

Softkeys

ARGUS

Menu control

Confirmation key

Layer 1 measurement

Number pad

Calling

Pickup / Hang up

Power

Microphone

Fastener for
shoulder strap
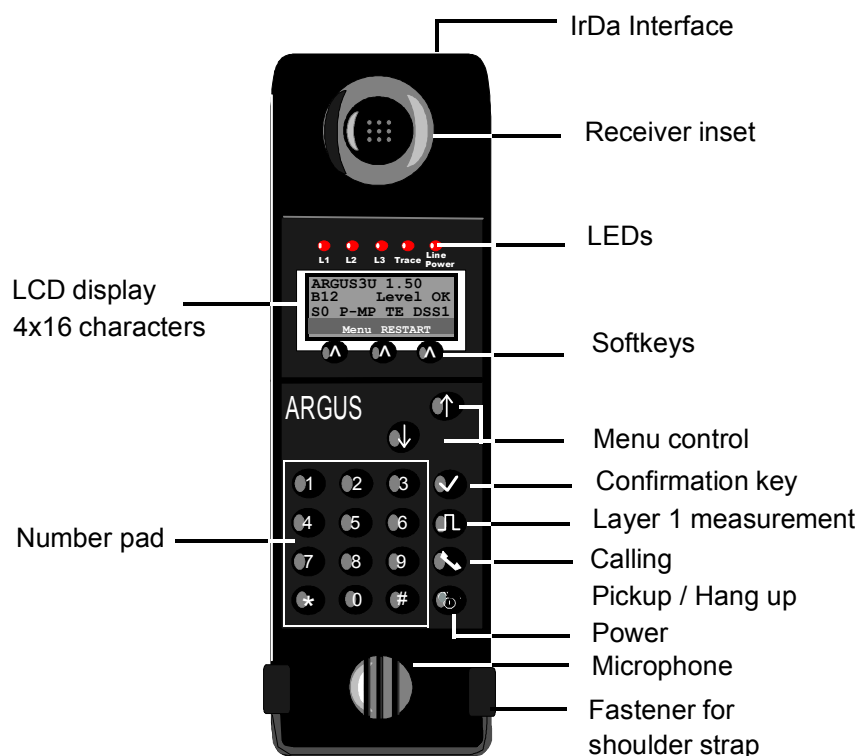
Power-Key:

- To switch the ARGUS ON/OFF
- To start up again after a power down
- Switches on the display backlighting (to save power, in battery mode the backlighting is switched OFF automatically after 5sec.)
- To switch the ARGUS OFF
  (must be pressed somewhat longer)

Confirmation key:

- Select menu or continue

Menu control:

- Open the menu list
- Scroll through lists
- Select a menu
- Select a function in an open menu

Telephony (pickup and hang up)
- Simplified overlap signalling: Press the telephone key twice.

Layer 1 Measurement:

Start the Layer 1 measurement
(Level/Voltage)
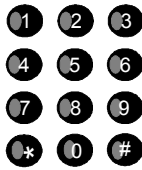
Number Pad:

- Entry of the digits 0....9 and of the special characters *, # (e.g. the call number or numerical entry in a function)
- Direct function call (see Chap. 6.3 Keys)

Softkeys:

The function of the 3 softkeys varies with the situation. The current function of each softkey is shown in the highlighted fourth line of the display.

Connectors on the End:
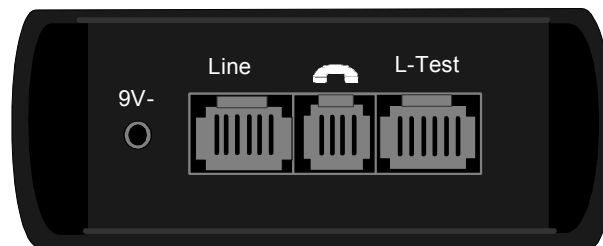
• **9 V-**

Connection for the external power supply. When the power supply is plugged into this connector, the battery will be disconnected.

• **Line**

Pin Assignment
3/4/5/6 **BRI**
7/8 **Uk and analog (a/b)**

- Connection for BRI lines
  (TE simulation or monitoring)
- Connection for a BRI terminal (NT-Simulation)
- Connection for an analog network
- Connection for the U_k network

- Connector for a Headset

- **L-Test**
- Connection for the test adapter for line tests
- Serial interface to connect a PC or - via a serial/parallel adapter - a parallel printer

Infrared Interface

The wireless transfer of data to a PC is possible using the integrated infrared interface.

The infrared interface must be in the line of sight of the receiver. During data transfers, the IR beam can be interrupted for up to 30 sec without disturbing the transfer. During the interruption, the data will be buffered and will therefore not be lost.

During the recognition phase, the ARGUS must be within 20 cm of the PC's infrared receiver. Later, during the data transfer, the IR-link will work at distances of – depending on the baud rate – up to 70 cm.

Changing the batteries

The battery compartment for three AA (Mignon) batteries or accumulators is located on the back of the case. Unscrew the screws to remove the cover of the case and insert the batteries in accordance with the polarity marking.

A battery symbol begins to blink in the LCD display, when there is still approximately 15 minutes reserve. During this period, it is possible that there may be audible interference and in rare cases even malfunctions.

Power Down

In battery operation, if the ARGUS is idle for 15 minutes, it will automatically switch to the power-down mode (power-down). From this mode, the system can only be reactivated by pressing the Power-Key. In the power-down mode, a battery will last about 3.8 years. Therefore, this mode serves as an effective protection against discharging the batteries.

Naturally, when the loopback function is active on the ARGUS or it is in Trace mode, the ARGUS will **not** switch to power-down mode.

As an alternative, it is possible to operate the ARGUS using the included power supply. When the power supply is connected, the battery is automatically disconnected.

The ARGUS can also be powered from the BRI line. In this case, it does not need batteries, accumulators, or the plug-in power supply.

Whenever the ARGUS is powered from the plug-in power supply or the BRI line, the power-down mode is reasonably enough not active.

Regardless of the type of supply used, you should always operate the ARGUS with batteries installed. This will ensure the uninterrupted operation of the real-time clock.

5 Menu Hierarchy

```
        ┌──────────┐
        │ ARGUS ON │
        └────┬─────┘
             │
             ▼
      ┌──────────┐   Yes      ┌───────────┐
      │ Setting  │──────────▶ │ Main Menu │
      │ OK ?     │            └───────────┘
      └────┬─────┘
        No │
           ▼
   ┌──────────┐  ┌──────────────┐  ┌───────────┐  ┌───────────┐
   │ Menu     │  │ Menu         │  │ Telephony │  │ Menu      │
   │ Access   │  │ Single Tests │  │           │  │ L1 Status │
   └──────────┘  └──────────────┘  └───────────┘  └───────────┘

              ┌──────────────┐      ┌───────────────┐
              │ Menu         │      │ Menu          │
              │ Autom.Test   │      │ Configuration │
              └──────────────┘      └───────────────┘

   ┌──────────────┐  ┌──────────────┐  ┌─────────────────┐
   │ Menu         │  │ Menu         │  │ Menu            │
   │ Access Mode  │  │ Test Manager │  │ Level Measuring │
   └──────────────┘  └──────────────┘  └─────────────────┘
```
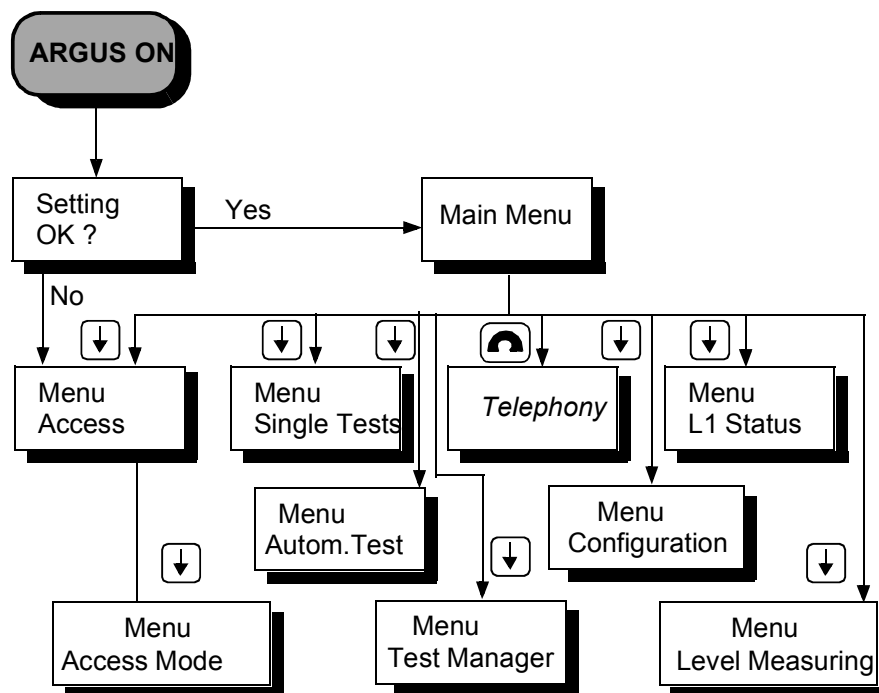
┌──────────────────────┐
│   *Access* Menu   │
└──────────────────────┘

Selection of the physical access:

• **Basic Rate Interface**

• **U Interface**

• **Analog (a/b) Interface**

• **Automatic**

automatic detection of the interface used

• **Line test**

This tests the terminating resistors for the cabling of a four-wire bus. Additionally, the test also detects errors in the cabling e.g. broken wires, short-circuits and crossed wires.

┌──────────────────────┐
│ *Access Mode* Menu │
└──────────────────────┘

The *Access Mode* menu opens automatically once the physical access is selected (in the *Access menu)*.

Operation on a BRI (S-_{Bus}) Access

- **TE Automatic (TE-Simulation automatically)**

- **TE P-P (TE-Simulation point-to-point)**

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

- **NT P-P (NT-Simulation point-to-point)**

- **NT P-MP (TE-Simulation point-to-multipoint)**

- **S-Bus Monitor**

  The ARGUS records all of the D-channel signals and passes them to the serial   interface   or   the infrared interface. Layer 1 will not be actively affected by the monitor function.

- **BRI Recorder**

  The ARGUS records all of the D-channel signals on the BRI access   and saves them in the internal Flash memory. Layer 1 will not be affected by the Recording function.

- **Permanent circuit**

- for telephony, BERT, loopbox

  Operation on a U-interface access

- **TE Automatic (TE-Simulation automatically)**

- **TE P-P (TE-Simulation point-to-point)**

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

- **Permanent circuit**

  for telephony, BERT, loopbox

  Operation on an analog access

- **Analog terminal**

- **Analog (a/b) Monitor**

  High impedance tap without influencing the interface

  Single Tests Menu

- **Supplementary Services**

  Supports, for 1TR6 , automatic query of the available supplementary services as well as, for DSS1, manual selection of - and then automatically run - tests of the

most important supplementary services.

- **Service Tests**

    Tests all of the important services by setting up a call to itself. To perform this test completely, there must be at least 2 B-channels available.

- **Bit Error Test**

    Performs a simple bit error test, which can be run as either an extended call to itself, to a loopbox or "end-to-end".
    During the test, the ARGUS shows the bit errors and the remaining measurement time in seconds. The test results, the bit error rate, will be presented in exponential form. Additionally, the results will be evaluated in accordance with ITU-T G.821 and G.826.
    With permanent circuits and dialup connections, the same type of BERT can be run simultaneously on the second B-channel of a BRI.

- **X.31 Test**

    Performs a X.31 test in the D-channel that checks all TEI values from 0 - 63. The TEIs released for the X.25 service will be shown on the ARGUS.
    The ARGUS checks the released TEIs to determine whether there is access to the X.25 network.

- **CF Interrogation**

    The ARGUS checks whether call diversions are active in the exchange for the access under test (either CFU, CFNR or CFB). All currently setup call diversions will be shown on the ARGUS (maximum of 10) and can, where needed, be deactivated.

- **Connection**

    The ARGUS displays the number dialed, the charges , other information (e.g. SUB, T.o.n etc.) plus   the   B-channel used.
    In the case of the service *Telephony*, the speech channel will be switched onto either the integrated handset or an optional headset.

- **Time measurement**

    The ARGUS measures the setup time, the propagation time of the data and the interchannel delay.

Test Manager Menu

It is possible to simultaneously and independently run multiple tests (or connections). All of the tests that have been started will be administered by the Test Manager.

Automatic Tests

- **Start**

  The ARGUS executes the test(s) automatically.

- **View**

  The ARGUS saves the results of several test series and presents the test results on the display.

- **Sending data to a PC**

  The test data saved on the ARGUS will be sent to the connected PC (when WINplus is started). WINplus presents the measured data in a clear test log.

- **Printing**

  With a special (optional) cable, it is also possible to print a simplified test report on a Centronics printer.

Settings Menu

- **Trace mode**

  The ARGUS passes the recorded D-channel data to the connected PC or saves it in the internal FLASH memory.

- **Enter numbers**

  Enter a maximum of ten (24 place) call numbers in the speed dialing memory. The first number in the speed-

dialing memory must be the own call number of the access under test. This call number will be needed later for the service test as well as for use in all outgoing calls as your own call number (CGPN or OAD).

- **ISDN**

  Settings in ISDN:

  - L1 permanent?
  Determines, whether Layer 1 should be permanently active for a BRI connection in NT mode.
  (only when the ARGUS is operated in NT mode on a BRI access).

  - Protocol
  Manually switch between the 1TR6, DSS1, CorNetN, CorNetT and QSIG protocols.

  - Alerting mode
  Setting to display numbers dialed after an incoming call is setup.

  - Clock mode
  Here, you can select where - regardless of whether in TE or NT operating mode - the clock for the ISDN access is generated.

  - BRI termination
  Options for the terminating resistor for the BRI access regardless of whether in TE or NT operating mode.

  - Call parameter
  Two different parameters can be set for a call setup (in ISDN):
    - **T**ype **o**f **N**umber (TON) for the CGN or CDN element of a SETUP signal
    - Numbering plan (NP) for the CGN or CDN element of a SETUP signal

  - Call accepted

Sets, which calls the ARGUS should signal on a P-MP access: own MSN or all

- **BERT**

  Options for the BERT

  - BERT time

  Set the duration of the BERT in minutes.

  - HRX value

  Set the HRX value (hypothetical reference connection see ITU-T G.821)

  - Error level

  Enter the error level for the automatic Good/Bad evaluation of the bit error test

  - Bit pattern

  Selection of the bit pattern used in the bit error test

- **Analog config.**

  Options for an analog access

  - Analog dial

  Specifies the analog dialing mode: DTMF or pulse dialing

  - Analog CLIP

  Set the transfer procedure used to pass the call number: FSK or DTMF

  - Analog message

  Specify the display of received messages.

  - AOC pulse

  Set the country-specific advice of charge pulse used on the analog access (12 or 16 kHz)

  - DTMF parameter

  The ARGUS can set the parameters *Level*, *Duration* and *Interval* of the DTMF signals generated during analog operation.

  - FLASH time

  Set the duration of the FLASH time (40 ms to 1

second)

- **ARGUS config.**

  Settings for the ARGUS

  - Menu language
    Select the language to be used in the menus

  - LCD contrast
    The contrast setting for the display

  - Date / Time
    Enter the date and time. The time is kept by a built-in real time clock.

  - Handset
    Select the internal handset or an external headset

  - Printer
    Setup the printer used for the print function

  - Alarm
    Activates or deactivates the ARGUS's alarm signal (e.g.in the event of an error)

  - Baud rate
    Sets the maximum baud rate (used in linking the ARGUS to a PC)

  - PC Access
    The data can be transferred to the PC via the serial interface or cordlessly via the IrDa interface.

- **Reset**

  Resets all of the settings to the original factory (default) settings

> *Level   Measuring*

- **Level measurement on a BRI or a U-Interface access**

- **Measures the signal level of the remote end on a BRI**

- **Level measurement on an analog access**

- **Load test of the U-Interface at different levels**

> ## *L1 Status* Menu

The ARGUS displays the current status of the Layer 1 on a BRI access .

> ## *Telephony*

Simplified telephoning using the telephone key. Pressing the telephone key twice seizes the exchange line. Once the call number is entered the call will be setup.

6 Menus

6.1 Automatic Access Test

Using the included cable, connect the ARGUS to the access to be tested.

Once the ARGUS is switched on, the starting window will open displaying the access and mode parameters selected last:

```
ARGUS10 2.10
Setting OK?
BRI TEs
  No        Yes
```
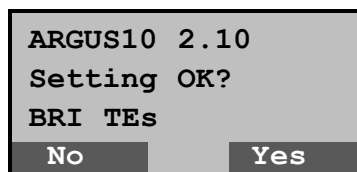
Displayed in the first line:
The software version number: 2.10 (in the example)
Country code: _ (=General), E (=Spain), F (= France), D (=Germany)

Displayed in the third line:

Type of access: BRI, U-interface, PRI or analog

Operation mode: NTs = NT Simulation Slave Mode
                    (see Chap. 6.9.2.4 Clock mode page 120)
                    NTm = NT Simulation Master Mode
                    TEs = TE Simulation Slave Mode
                    TEm = TE Simulation Master Mode
                    Perman.swit.
                    Monitor
                    Terminal
                        (only with an analog (a/b) access)
                    Line Test

Displayed in the fourth line:

The fourth line displays the current assignment of the three softkeys below.

If you press on **"Yes"** (= softkey on the right), the displayed parameters will be accepted and the ARGUS will be initialized.

The softkey in the middle has no function in this state.

If you press on "**No**" (=softkey on the left), changes to the displayed parameters will be discarded and the Access menu will be opened:

```
Connections:
→BRI
  U interface   ↓
  ┗━      ↓      ✓
```
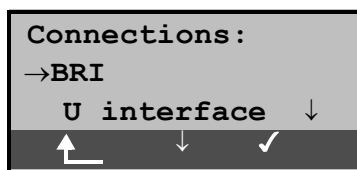
With the ↓ ↑-keys, specify which type of physical access is to be tested.

If *"Automatic"* is selected at this point, the ARGUS will automatically determine the physical access (BRI, U-Interface or analog). In this case, the ARGUS sets BRI and U-Interface accesses to TE-mode(see Chap. 6.4.1 page 31).

⚠ In this case, the Access Mode menu will not open, therefore functions such as S0-Monitor, S0-Recorder and Permanent Circuit are not available.

The selected type of access will be marked on the left edge of the display with an arrow → . Press the confirmation key or the softkey on the right < ✓ > to confirm the selected type of access (see Chap. 6.3 Keys page 28).

Alternatively at this point, you can also select the line test and, by pressing the softkey <✓> on the right, directly start it (see Chap. 6.4.2 page 32).

The *Access Mode***menu will open automatically**(see Chap. 6.5 page 36)**.**

```
Access Mode:
→TE-automatic
  TE P-P          ↓
  ┗━      ↓      ✓
```
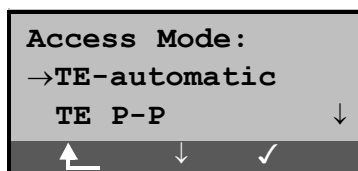
Using the ↓ ↑-Keys, select the desired access mode.

The selected access mode will be marked on the left edge of the display with an arrow → (in the example: TE-automatic).

Press the confirmation key or the softkey on the right <✓> to confirm the selected type of access.
Initializing the ARGUS :

- Operating the ARGUS on a BRI (S-Bus) or U-interface access or operation as a BRI (S$_0$) NT simulator:

Once the access and access mode parameters have been selected or accepted,   While Layer 1 is being setup, the L1 LED above the display will blink. If an error occurs, the message *No Net* will be displayed.

As soon as Layer 1 is successfully setup, LED L1 will light continuously.

When the ARGUS is operated on a U interface, it can take up to 2.5 minutes to activate Layer 1.

As soon as (and as long as) Layer 2 is successfully setup, LED 2 will also light.

If no error occurs, the ARGUS will display the successfully found access and access mode in the third line. Additionally, a qualitative assessment of the level will be displayed.

The ARGUS will, regardless of whether it is in TE or NT mode, automatically determine the protocol and attempt to setup Layer 3 (LED L3 lights). At the same time, the B-channel test will be started and the results will be displayed.

The ARGUS will then idle in the Main menu's status display.

Status display example:

```
ARGUS10 BRI
B12      Level: OK
TEs    P-MP    DSS1
       Menu RESTART
```

The test found that it is a BRI multiple device access using the DSS1 protocol.
The bus configuration is displayed in the third line:
P-P   = point-to-point
P-MP   = point-to-multipoint

In the example both B-channels are available.
B12   both channels are available
B1-   only B-channel 1 is available
B-2-   only B-channel 2 is available
B--   no B-channel available

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

In the example, the level is in order (level can only be evaluated on a BRI access):

OK the level is in order

<< the level is too low

>> the level is too high

-- no level

The ARGUS is in TE Slave Mode.

On a bilingual access, the ARGUS uses the DSS1 protocol and thus behaves as a "DSS1 terminal".
You can manually switch the ARGUS to the 1TR6 protocol using the *Protocol* function in the *Configuration/ISDN* menu (see "Select the D-channel protocol" on page 118).

- Operating the ARGUS on an analog access

The following will be displayed:

```
ARGUS10 analog


        MENU   RESTART
```
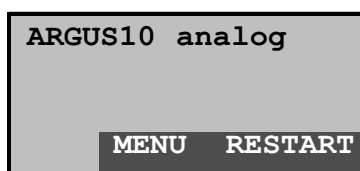
6.2 Status display

The ARGUS automatically determines the configuration of the access and the protocol used and inserts both parameters in the remaining tests. Thus manual configuration of the ARGUS is unnecessary. However, it is possible to manually change the protocol using the *Configuration* menu (see Chap. 6.9.2.2 Select the D-channel protocol page 118).

The status of the access under test (U interface, BRI or analog) is always displayed in the first line.

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

To repeat the B-channel test, press the **<RESTART>** softkey on the right.
If the test cannot be executed without errors (e.g. because the access was unplugged), the ARGUS will, depending on the class of error (see "Suppl. Services Tests – Error messages" on page 81), reinitialize or show an error message.

If you press the **<MENU>** softkey, the ARGUS will return the Main menu.

6.3 Keys

The ARGUS is in largest part operated with the two ↓ ↑ - Keys, the confirmation key ✓ and the three softkeys.

In the status display, the <MENU> softkey will return the ARGUS to the Main menu, which includes of a list of all of the available menus.
In the remaining manual, the softkeys are represented by their respective labels placed in brackets **< >**, thus in the sample above the softkey would simply be <MENU>.

The < ✓ > softkey serves the same function as the ✓ confirmation key and the <↓ > softkey performs the same function as the corresponding arrow key on the ARGUS keypad.

Once the list is open, you can scroll through the available menus with the <↓> Key:

- **Single Tests**
- **Test Manager**
- **Automatic Tests**
- **Level Measuring**
- **L1 Status**
- **Configuration**
- **Access**

A ↓ displayed after a menu indicates that this menu has further entries, which can be scrolled through using the <↓> Key.*.*
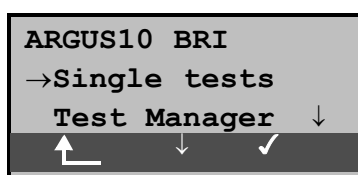
```
ARGUS10 BRI
→Single tests
 Test Manager   ↓
```

With the <✓>, you can open the menu currently marked with the → (in the sample *Single tests)*.

```
Single Tests
→Supp.serv.test
 Service test    ↓
```

The name of the currently opened menu will be displayed in the first line. Below this are the available functions. A ↓ on the right side of the display indicates that you can scroll

through additional functions with the <↓> Key.

With the <✓>, you can open the menu currently marked with the → (in the sample *Single Tests)*.

With ↰ you can jump from the current display back to the previous level.

Using the digit keys, you can start important ARGUS functions directly, regardless of the currently active menu level.

Number 2 Key Start Service Test
Number 3 Key Start Supplemental Service Test
Number 4 Key Start Auto. Test
Number 6 Key Start Test Manager
Number 7 Key Entry of your own and remote
                call numbers in the speed-dialing memory
8 Key   Trace ON/OFF
Number 9 Key Start Bit Error Rate Test (BERT)

⚠ If a function is called where the ARGUS expects the entry of a digit, pressing a number key will be interpreted as the expected input.

6.4 Menu: Access

Opening theAccess menu:

```
ARGUS10 BRI
B12    Level: OK
TEs   P-MP   DSS1
    MENU  RESTART
```

```
ARGUS10 BRI
→Access
--------------↓
  ↰      ↓     ✓
```
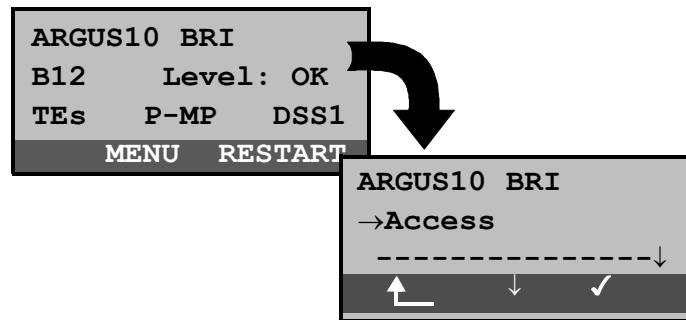
	Operation
\<RESTART\>	Repeat B-channel test
\< MENU \>	Open the *Main menu*
\< ↓ \>	Select the *Access* menu
\< ✓ \>	Open the *Access* menu
↰	Return to the status display

Throughout the remaining manual, under each display, you will find a table that describes the operation of the ARGUS in the current situation.

On the left side of the table, you will find all of the ARGUS keys that are available for the user to press in the current state (e.g. ↓ for the ↓ Key or < ↓ > for the corresponding softkey).

On the right side of the table, you will find an explanation of the function of each key in this context.

means that at this point the ARGUS expects the user to enter data on the numeric keypad

6.4.1 Selection of the physical access

In the Access menu, the user must select the type of physical access to which the ARGUS is connected. When the ARGUS is restarted, the settings used last will be suggested as the default.

If **Automatic** is selected, a fully-automatic process will be started: The ARGUS will automatically recognize a BRI, $U_{interface}$ or analog access. In the case of a BRI or U interface access, the ARGUS will be set in the TE mode and the access mode (PP or P-MP) will be determined automatically. The ARGUS will determine which D-channel protocol is used on the BRI or U interface access. After the level was measured (only for an ARGUS 22 on a BRI access) the ARGU will return to the Main menu.

```
Access
→BRI
  U interface    ↓
    ↰      ↓      ✓
```
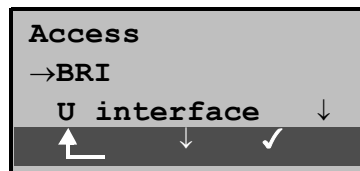
Operation	
< ↓ >	Select desired access
< ✓ >	Confirm
	When the BRI, U interface, or analog interface is selected, the Access Mode menu will open automatically.
↰	Return to the Main menu

6.4.2 Line Test

The ARGUS tests the terminating resistors for the cabling of a four-wire bus. Additionally, the test also detects errors in the cabling e.g. any broken wires, short-circuits and crossed wires.

⚠️ Unplug the NT and all terminal equipment from the bus, before performing a line test!

If the ARGUS detects an operator error (Line test on a fed bus), it will emit a continuous acoustic signal. In this case, to prevent the destruction of the ARGUS, the line test will **not** be started.

Test sequence:

To perform a thorough test of the lines, the test must be done in 2 steps.

First step:

Use the test adapter to connect the ARGUS to the lines to be tested. In this step, the ARGUS will determine whether or not there is a short circuit or a terminating resistor and whether there is a fault between the terminating resistor – if there is one – and the test adapter.
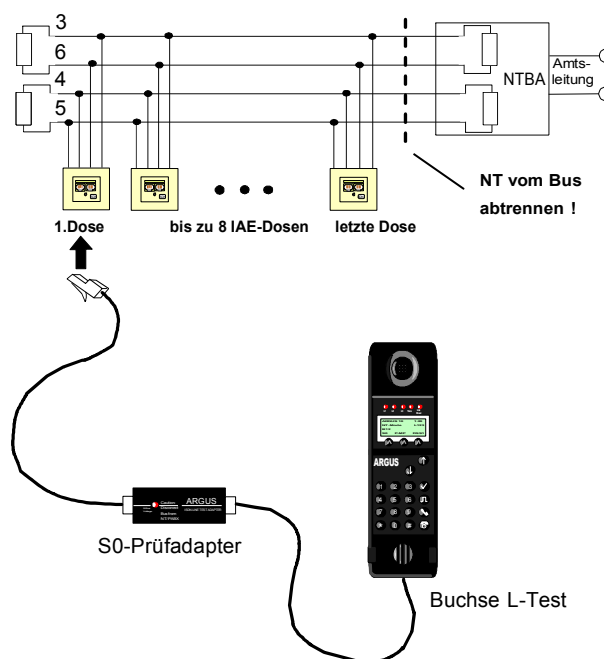
Possible test results:

- The ARGUS has detected a short-circuit: Clear the fault and repeat the test

- The ARGUS reports that the resistance is wrong: Repeat the test from another socket, if necessary remove the terminating resistor(s)

- The ARGUS reports that the line is OK: Continue test with step 2

Second step:

Connect the test adapter to the jack, which was tested as OK in the first step. Connect the ARGUS via its *L-Test* connector to the next jack on the bus.
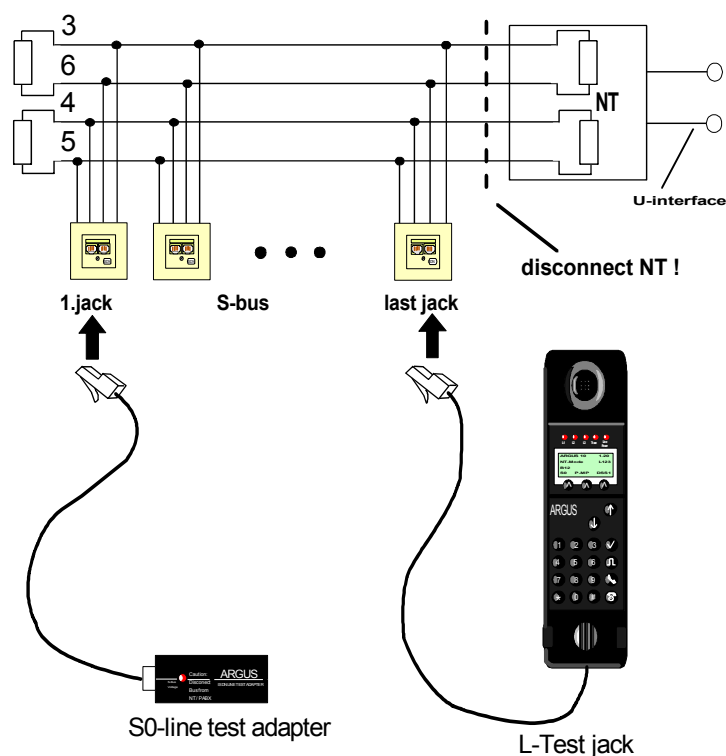
Possible test results:

- The ARGUS reports broken connections or crossed wires: Clear the fault and repeat the test beginning with the first step.

- The ARGUS reports that the line is OK: Connect the ARGUS (L-Test jack) to each of the sockets on the bus one after the other.

Test steps on the ARGUS:

```
Access
→Line test
 ---------------↓
 ↰      ↓      ✓
```

```
ARGUS10 BRI

Line test
        MENU   START
```
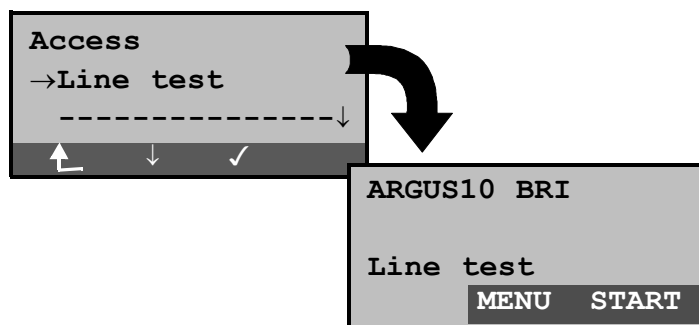
	Operation
< MENU >	Opens a list with the following menus: Access, Automatic Tests, Configuration, Start L-Test and Level Measuring.
	The *Autom.Test* menu only has functions for displaying measured data and transferring it to a PC. In this menu, you cannot start an automatic test series(see Chap. 6.8.1 Starting the Automatic Test page 109).
< START >	**Start the Line Test**

Sample test results – Line Test:

```
Line test
Line OK
Termination 100Ω
ABORT        NEW
```

No errors occurred.

```
Line test
Crossed wires:
             3><6
ABORT        NEW
```

Wires 3 and 6 are crossed.

If the message "Crossed wires: termination wrong" appears, the measurement conditions with

respect to the location of the fault or to the complexity of the fault are unfavorable.

In this case, you should change the measurement conditions in the following manner:
Remove the terminating resistors from the bus and repeat the test.

Frequently it is enough to simply swap the test adapter and the ARGUS.

Comments about the test results:

- The bus can first be considered to be free of defects, when all of the sockets have been tested as OK.

- Short-circuits are reported as a resistance value < 10 Ω.

- Crossed wires and broken connections between the test adapter and the terminating resistor cannot be found.

- The displayed test results are either for just the bus lines between the ARGUS and the test adapter in the case of cross-wires and broken connections or for the entire bus in the event of short-circuits and terminations.

6.5 Menu: Access Mode

The Access Mode menu is **not** selectable from the Main menu. It opens automatically once the physical access is selected in the Access menu.

```
Access Mode
→TE mode
  NT P-P     ↓
  ▲     ↓     ✓
```
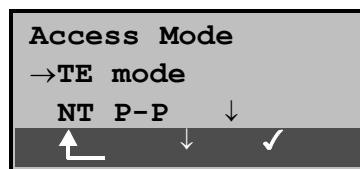
	Operation
< ↓ >	Select the desired *mode*.
< ✓ >	Confirm
▲	Return to the *Access* menu

6.5.1 Operation on a BRI access

The following settings are possible:

6.5.1.1 TE-Simulation mode

TE automatic
On a BRI access, the access mode (PP or P-MP) will be determined automatically. The ARGUS will then jump to the Main menu.

TE P-P or TE P-MP
Afterwards, the access and the protocol stack will be initialized in accordance with the selected setting. The ARGUS will then jump to the Main menu.

6.5.1.2 NT-Simulation mode P-P or P-MP

NT P-P or NT P-MP
Afterwards, the access and the protocol stack will be initialized in accordance with the selected setting. The ARGUS will then jump to the Main menu.

6.5.1.3 Permanent circuit

Besides dial-up connections to any subscriber, ISDN also supports the use of permanent circuits switched to a specific remote location.

These permanent circuits are available after setting up Layer 1, in other words after synchronizing both terminals by exchanging HDLC-frames.

The location where the clock is generated can be selected on the ARGUS(see Chap. 6.9.2.4 Clock mode page 120).
As a quick test of a permanent circuit, you can simply call the opposite end using a selected B-channel. However, for a more revealing test of a permanent circuit, you should perform a bit error rate test.
Both ends of the permanent circuit must use the same channel.

■ **Telephony on permanent circuits**

The function can be started with the ☎-Key or via the selection *Phone / connec.* in the *Single tests* menu (see Chap. 6.6.1 page 53).
After the B-channel for the permanent circuit is selected, the telephone connection will be setup automatically.

```
Permanent circuit
Telephony    B01
Durat.    13:45:59
ABORT   TM
```

	Operation
`<Abort  (on hook)>`	Terminate permanent circuit
`< TM >`	Call the Test Manager (see "Menu: Test Manager" on page 100)

Besides the function Telephony, the ARGUS also shows the B-channel used (second line in display) and the duration of the permanent circuit (third line).

■ **BERT on permanent circuits**

A number of variations are possible in testing permanent

circuits with the bit error rate test.

In the simplest case, a B-channel loop will be set up at the remote end.

After selecting *BERT start (*menu *Single tests /* submenu *Bit error test /* function *BERT start : see "BERT start" on page 87)* and selection of the channel to be tested (B-channel or D-channel), the ARGUS will send the test pattern, receive it back and evaluate it accordingly.

The display during and after the bit error rate test as well as the operation are in largest part similar to that of a BERT with dial-up connections (see Chap. 6.6.5 Bit error test page 85). The only difference is that it is not necessary to select a call number or service.

In the case of a BRI_0- access in end-to-end mode (see "Bit error test" on page 85 and on page 92 "Bert wait"), it is also possible to run a BERT in the D-channel.
In this case, a *channel select* window will open:

```
┌─────────────────────────┐
│ Channel select          │
│ →D-channel              │
│   B-channel        ↓    │
│ ABORT     ↓      ✓      │
└─────────────────────────┘
```

	Operation
< ↓ >	Selecting a *channel*
< ✓ >	Confirm the selected channel and start the test. When selecting a *B-channel*, the *B-channel select* window will open to allow you to choose the desired B-channel.
<ABORT >	Close window and discard any selection that was made

The ARGUS displays the following during the test:
the channel used: D for D-channel
the remaining test period in hours:minutes:seconds:
24min:12sec

the number of bit errors that have occurred: 00002
the synchronicity of the bit pattern: Synchronous

```
BERT              D
00:24:12      00002
Synchronous
ABORT   TM   ERROR
```

	Operation
< ERROR >	Injects an "artificially generated" bit error (to check the reliability of the test)
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)
<ABORT >	Test - interrupting

■ **Loopbox on permanent circuits**

It is possible to activate a loopbox (see "B-channel loop" on page 93).

On a BRI access, the loopbox is permanently setup for both B-channels but **not** for the D-channel.

```
Permanent circuit
Loopbox active
Durat.   12:45:59
AM
```

	Operation
<ABORT >	End loopbox activation

The ARGUS shows how long the loopbox has been active on third line in the display.

6.5.1.4 BRI Monitor

The ARGUS accepts all of the D-channel signals from the BRI access and sends these D-channel signals over the serial interface or via the IrDa interface to a PC on which ARGUS WINplus or WINAnalyse must be running. The bus and Layer 1 are not influenced by the monitoring.

```
Access Mode
→BRI Monitor
  BRI Recorder  ↓
   ↰       ↓      ✓
```

```
ARGUS10 BRI
Level OK OK
Monitor
         MENU   START
```
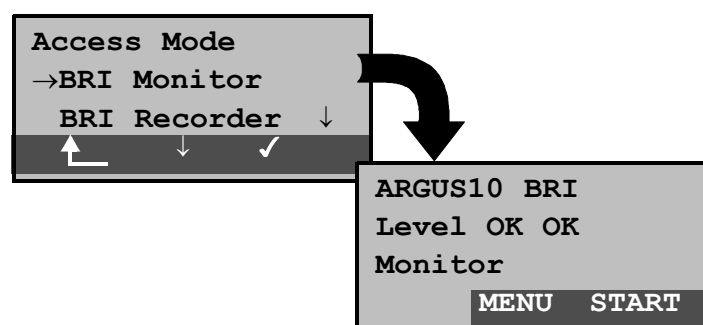
After starting the *Monitor* function, the ARGUS will first be in Monitor mode (the monitor is not yet active): the second line shows the evaluation of the level on the NT-side (first OK or << (too low), >> (too high), _ (no level) and TE-side (second OK).

	Operation
< **MENU** >	Opens a list with the following menus: *Start Monitor*, *Access*, *Automatic. Tests*, *Configuration* ,*Level measuring* and *L1 status.*
	The *Autom. Test* menu only has functions for displaying measurement data or transferring it to a PC. In monitor mode, you cannot start an automatic test series (see Chap. 6.8.1 page 109).
< **START** >	**Start Monitor** , automatically opens the associated display window

```
Monitor
Signals:          25
Time:       00:02:59
ABORT
```

< **ABORT** > Deactivate the function and return to the "Monitor mode" display (not active)

When the monitor function is active, the ARGUS counts the number of incoming signals and presents this number in the second line of the display. The amount of time that has passed since the monitor was started is displayed in third line. The Trace LED is on.

The recorded D-channel signals will be sent via the serial interface or the IrDa interface to the PC, which must be running either ARGUS WINplus or ARGUS WINAnalyse.

■ Parallel call display in the BRI Monitor mode

When the Monitor mode is active, the ARGUS will search all of the D-channels signals sent for a SETUP. As soon as a SETUP is found, the *CALL* softkey will appear in the Monitor window.

```
Monitor
Signals:          25
Time:       00:02:59
ABORT        CALL
```

Operation

< CALL > The ARGUS displays the data for the (incoming or outgoing) call. The ARGUS will automatically process the last SETUP received.

```
N->U        FaxG3
125670         B01
to:   02351901720↓
ABORT
```

In the first line of the display, you will find the call direction

(**Ne**t -> **U**ser, bzw. **U**ser -> **Ne**t) and the service (in the example *FaxG3*). In the second line, your own call number (in the example *125670*) and the B-channel used (here: *1*) will be displayed. The destination number is displayed in the third line.

	Operation
< ↓ >	The sub-address, User-User-Info, DSP messages (if existent), Type of number (T.o.n) and Numbering Plan (NP) will be displayed in this order.
<ABORT >	Once you leave the *Parallel Call Display* function, the ARGUS will be in the Monitoring (**not active**) mode.
<Counter >	The ARGUS switches to the **active** Monitor window. Now, if you press <CALL>, the ARGUS will again display the call parameters.

6.5.1.5 BRI Recorder

In the Recorder mode, the ARGUS passively monitors the connected BRI access.

The ARGUS records all of the D-channel signals sent in both directions without affecting the access or Layer 1.

Unlike in the Monitor mode, the recorded D-channel signals will be saved in the ARGUS's internal FLASH memory and not sent to a PC.

The storage is organized as a ring buffer, i.e. as soon as the FLASH memory is full, the ARGUS will automatically overwrite the oldest data.

Display when operated on a BRI access:

```
Access Mode
→BRI Recorder
  Permanent swit↓
   ↑⌐      ↓      ✓
```

```
ARGUS10 BRI
Level OK OK
BRI Recording
           MENU   START
```

```
Access Mode
→BRI Recorder
  Permanent swit↓
   ↑⌐      ↓      ✓
```

```
ARGUS25   BRI
Level OK OK
BRI Recording
           MENU   START
```
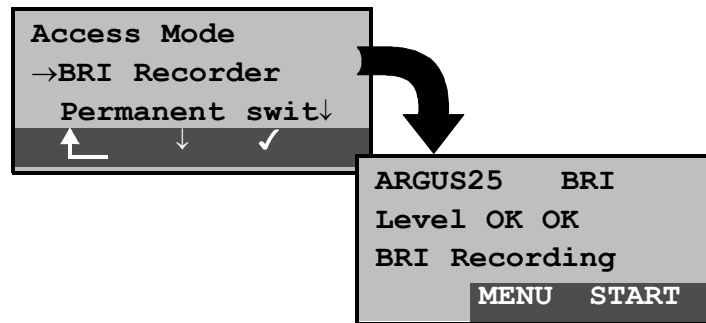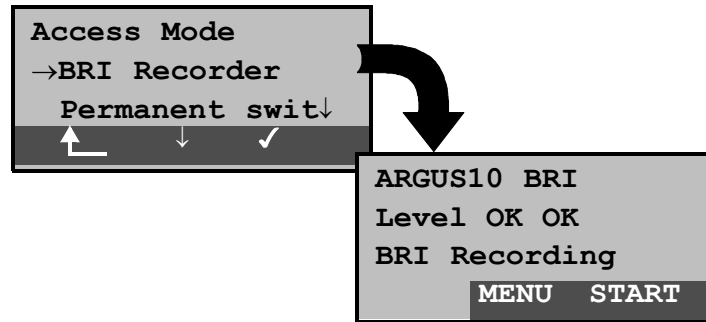
Display when operated on a PRI access:

```
Access Mode
→PRI Recorder
  Permanent swit↓
   ↑⌐      ↓      ✓
```

```
ARGUS25   PRI

PRI recording
           MENU   START
```
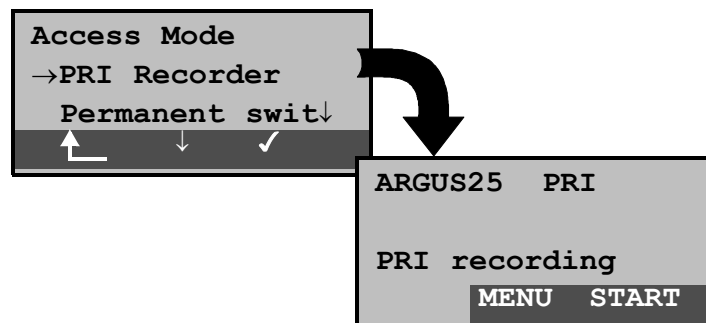
Operation

< ↓ >	Select the *BRI Recorder* .
< ✓ >	Start the *BRI Recorder* function. The ARGUS is now in the "Recorder" mode (Monitoring is **not** yet active!) and will check the levels on the NT and TE sides of the . Displayed in the second line: Level on the NT-side (**<<** too low, **>>** too high, OK, ___ no level), level on TE-side (**<<** too low, **>>** too high, OK, ___ no level)
↑⌐	Return to the Main menu

< **MENU** >	Opens a list of the available functions and menus: Start Recording, PC load all, PC load session, Reset Flash, Info Flash, Autom. Tests, Level measuring, L1 status, Configuration and Access.
< **START** >	**Start Recording** , automatically opens the associated display window

The *Autom. Test* menu only has functions for displaying measurement data or transferring it to a PC. In this menu, you cannot start an automatic test series(see Chap. 6.8.1 page 109).

In the BRI recording mode, the L1 status menu is not available.

■ **Active Recording Function**

When the Recording function is active, the *Trace* LED will flash. The ARGUS displays the number of signals received and the duration of the recording in hours:mínutes:seconds.

```
Recording      BRI
Signals:       23
Time:    00:12:54
ABORT
```

During the recording, the ARGUS also displays incoming and outgoing calls (see "n Parallel call display in the BRI Monitor mode" on page 41).

```
Recording     PRI
Signals:       23
Time:    00:12:54
 ABORT
```

■ **Flash Data Management**

In the Recording mode, several functions are available to manage the data recorded and saved in the FLASH memory:
- PC load all
- PC load session
- Reset Flash
- Info Flash

• *PC load all*

With the *PC load all* function, all of the contents of the Flash memory will be downloaded via the serial or IrDa interface to the PC, which must be running either WINplus or WINanalyse.
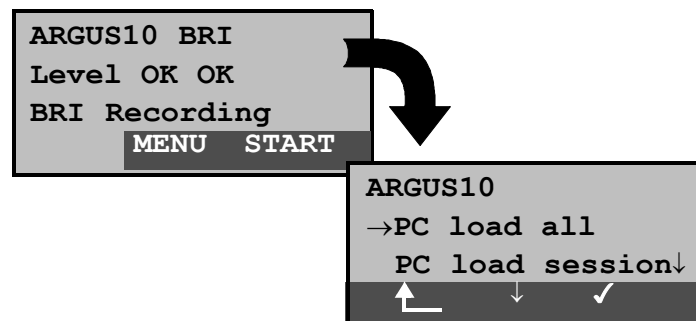
```
ARGUS10 BRI
Level OK OK
BRI Recording
      MENU   START
```

```
ARGUS10
→PC load all
  PC load session↓
  ↰      ↓      ✓
```

	Operation
< MENU >	Calls up the functions (or submenus) that the ARGUS supports in Recording mode.
< ↓ >	Select *PC load all*
< ✓ >	The download to the PC begins.
↰	Return to the not active Recording mode.

```
PC load all

45 % done
ABORT
```

Operation

< ABORT>   The download is stopped. Return to the menu.

Once the loading is successfully completed, the following display will open automatically:

```
PC load session
Loading done
Delete Flash?
ABORT       DELETE
```

Operation

< DELETE>   The contents of the FLASH memory will be deleted.

< ABORT>   The contents of the FLASH memory will not be deleted. Return to the menu.

• *PC load session*

In the ARGUS, the storage in the internal Flash is organized as a ring buffer, which can hold the data from a series of several sessions (i.e. independent trace recordings). At the start of each session, the date and time will be written as a string in the ring buffer.

The *PC load session* function transfers all of the data session-by-session to the PC on which either WINplus or WINanalyse must be running. The time and date that the session was started will be displayed in WINplus/ WINanalyse.
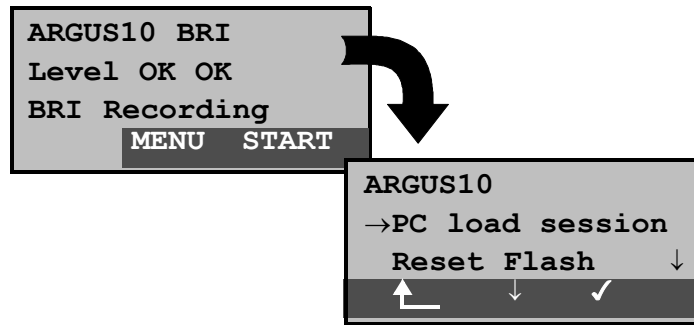
```
ARGUS10 BRI
Level OK OK
BRI Recording
      MENU   START
```

```
            ARGUS10
           →PC load session
            Reset Flash    ↓
            ↰        ↓      ✓
```

Operation

< MENU >   Calls up the functions (or submenus) that the ARGUS supports in Recording mode.

< ↓ >   *Select PC load session*

< ✓ >   The loading of the individual sessions will start.

↰   Return to the not active Recording mode.

```
PC load session

45 % done
ABORT
```

.   **Operation**

< ABORT>   Stop loading the session. Return to the menu.

After a session is transferred, the following will be displayed:

```
PC load session
Session done
Another session?
ABORT      CONT.
```

Operation

< CONT.>   The next session will be downloaded to the PC.

< ABORT>   Stop the loading and return to the menu.

Once the loading is successfully completed, the following
display will open automatically:

```
PC load session
Loading done
Delete Flash?
 ABORT        DELETE
```

	Operation
< DELETE>	The contents of the FLASH memory will be deleted.
< ABORT>	The contents of the FLASH memory will not be deleted. Return to the menu.

• **Reset Flash**

The *Reset Flash* function will delete the contents of the data
Flash memory at any time.

```
ARGUS10
→Reset Flash
  Info Flash     ↓
   ↰     ↓      ✓
```

```
Reset Flash

Delete Flash?
 ABORT      DELETE
```
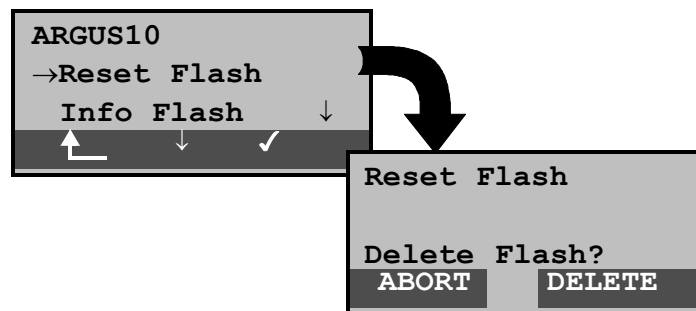
	Operation
< ↓ >	Select *Reset Flash*
< ✓ >	Start the *Reset Flash* function
↰	Return to the not active Recording mode.

< DELETE>	The contents of the FLASH memory will be deleted. The procedure can take several seconds. The ARGUS will show the progress of the detetion as the percentage done. It is not possible to stop the process of deletion. As soon as the entire FLASH memory is erased, the ARGUS will automatically return to the next higher menu.
< ABORT>	Return to the menu; the contents of the FLASH memory will not be deleted.

• **Info Flash**

Using the *Info Flash* function, you can check the status of the data in the FLASH memory:
- The number of saved sessions
  (displayed in the second line)
- Free memory in MB and in percent
  (displayed in the third line)

```
ARGUS10
→Info Flash
  Automatic tests ↓
    ↰      ↓      ✓
```

```
Info Flash
Sessions: 45
Free 2.0MB  50%
              MENU
```
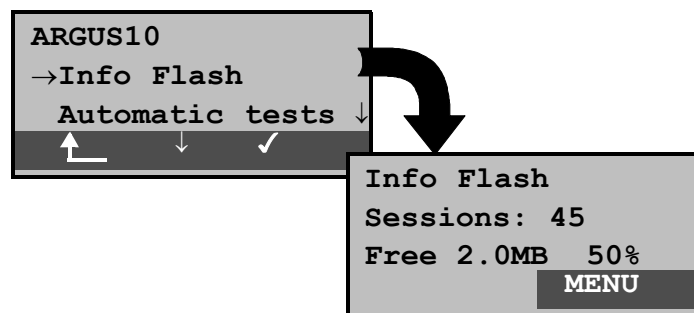
	Operation
< ↓ >	Select *Info Flash*
< ✓ >	Call up information about the status of the data in the Flash memory.
↰	Return to the not active Recording mode.
< MENU>	Continue to the menu

6.5.2 Operation on a U interface access

```
Access Mode:
→TE P-MP
  Permanent swit↓
   ⬑        ↓        ✓
```
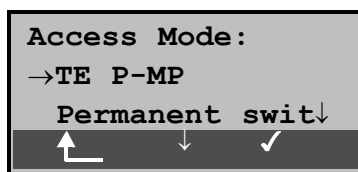
6.5.2.1 TE-Simulation mode

TE automatic
The ARGUS automatically determines the access mode (PP or P-MP). The ARGUS will then jump to the Main menu.

TE P-P or TE P-MP
Afterwards, the access and the protocol stack will be initialized in accordance with the selected setting. The ARGUS will then jump to the Main menu.

6.5.2.2 Permanent circuit

similar to that with a BRI access

6.5.3 Operation on an analog access

```
Access Mode
→a/b terminal
  a/b monitor
   ⬑        ↓        ✓
```
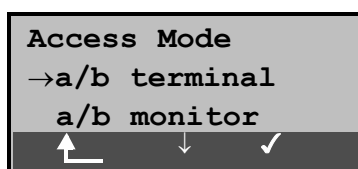
6.5.3.1 a/b terminal

The Argus behaves like an a/b (analog) terminal. The ARGUS will then jump to the Main menu.

6.5.3.2 a/b monitor

Essentially, the a/b (analog) monitor provides a high impedance tap that does not influence the interface. You can listen to the line with the integrated handset without having the ARGUS send on or otherwise influence the interface.

```
ARGUS10 a/b

Monitor
         MENU   START
```

Operation

< **MENU** > Opens the menu list:
Access, Automatic Tests, Configuration, Level and Start Monitor.
The *Autom. Test* menu only has functions for displaying measurement data or transferring it to a PC. In this menu, you cannot start an automatic test series(see Chap. 6.8.1 page 109).

< **START** > **Start Monitor**, automatically opens the associated display window

```
a/b monitor
02351907070
DTMF: 2346578   ↓
ABORT         DELETE
```

Operation

↓-Key Display further information
(e.g., transferred charges)

< DELETE> The display will be cleared.

< ABORT> Quits the *a/b Monitor* function.

If the access supports CLIP, the caller's number will be displayed on the second line.
The DTMF-characters dialed by both telephone subscribers will be displayed on third line.
Any additional DTMF-characters will be appended to the line, which will shift left for each character once it is full.

An incoming call will be signalled acoustically.

6.6 Menu: Single Tests

Opens the Singletest menu:

```
ARGUS10 BRI
B12     Level: OK
TEs    P-MP   DSS1
    MENU  RESTART
```

```
ARGUS10 BRI
→Single tests
  Automatic Test  ↓
    ↰      ↓     ✓
```
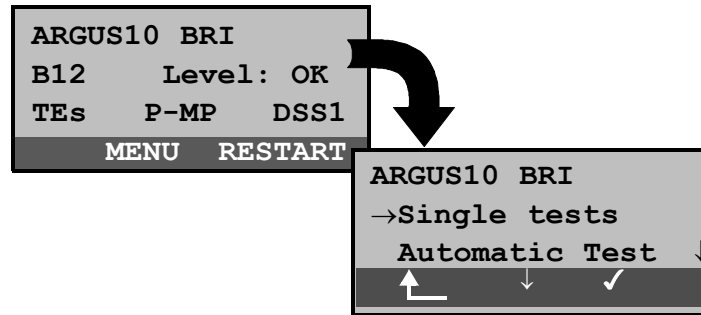
	Operation
<RESTART>	Repeat B-channel test
< MENU >	Open the *Main menu*
< ↓ >	Select the *Single tests* menu
< ✓ >	Open the *Single tests* menu
↰	Return to the status display

Open the functions in the Single tests menu:

```
Single Tests
→Supp.serv.test
  Service test   ↓
    ↰      ↓     ✓
```
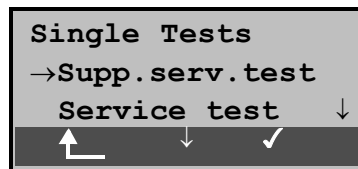
	Operation
↰	Return to the Main menu
< ↓ >	Mark the desired function
< ✓ >	Open the function marked with the →

6.6.1 Connection

6.6.1.1 Setting up an ISDN connection

a) The ARGUS can setup a connection for the following services:

- Tel. analog
- Fax G3
- Tel. ISDN (3.1 kHz)
- Fax G4
- Tel. 7kHz
- UDI 64kBit/s
- Voice
- Teletext
- 7kHz Audio
- Videoconference 1
- Videotext
- Videoconference 2

b) In the case of a telephone connection, you can either use the integrated handset or attach an optional external handset.

c) When an ISDN connection is setup, pressing the number keys (0-9) or the * or # will generate and send the corresponding DTMF tones .

■ **Procedureoutgoing call (ISDN)**

```
┌─────────────────────────┐
│ Single Tests            │
│→Phone / connec.         │
│  Time measuring         │
│ ┌─────┬─────┬─────┐     │
│ │ ↰   │  ↓  │  ✓  │     │
└─────────────────────────┘
```

	Operation
< ↓ >	Select *Phone / connec.*
< ✓ >	Confirm the selection and the *Enter numbers* window will open
↰	Return to the Main menu
Alternative: ↘-Key	Regardless of the currently active menu level, the ARGUS will begin to setup a connection. The window, *Enter numbers*, will now open.

• **Select or enter a call number**

The *Enter numbers* window will open automatically. Here you can choose between overlap and en-bloc signaling. When overlap signaling is chosen, the digits will be individually dialed as the numberkeys are pressed. In en-

block signaling, the complete dialing information will be sent in one block.

Display for en-bloc signaling:

```
Enter numbers
Overlap sending  ↓


              DEL
```

```
Enter numbers
Destination no.1↓
02351907070

              DEL
```

	Operation
< ✓ >	Select *Overlap* signalling. Overlap is used as the default to permit the simplest access to the dialing tone
or	In the case of overlap signaling, the *Select service* dialog opens immediately.
-Key	Select the entry mask *Select service* and the *B-channel select* will be skipped. The ARGUS will immediately display the *Outg.call* window.
	Return to the *Single tests* menu
↓ -Key	Select en-block: The speed-dialing memory, which can be used to store and dial your own plus up to 8 other call numbers, will open automatically (see "Saving Call Numbers" on page 150).
	Only with en-bloc signaling:
< ↓ >	Scroll to the desired call number
	or
	enter the new call number.
< DEL >	Delete individual digits
	Return to the *Single tests* menu

⟨ ✓ ⟩ or 📞-Key	The *Select service* window opens Select the entry mask *Select service* and the *B-channel select* will be skipped. The ARGUS will immediately display the *Outg.call* window.

⚠ The extension is separated from the access number by a #. For an outgoing call, the ARGUS uses the entire call number (without #) as the number called (CDPN or DAD) and, for the calling number, only the extension (DSS1-CGPN or 1TR6-OAD).

A "#" at the beginning of a call number is treated as a valid character. A '#' at the end of the own call number instructs the ARGUS to not send the caller's number for outgoing calls (CGPN or OAD).

An example:
02351 / 9070-20 is entered as 023519070#20.

Call numbers can be deleted digit for digit with the < DEL>-Key (DELete).

⚠ **Simplified overlap signaling using the telephone key:**
Regardless of the currently open menu, you can quickly and easily place a call: press the telephone key twice. The ARGUS will jump to the Overlap/ Connect function (in the Single tests menu). Press the telephone-key again (you will hear the dialing tone). The call number can now be entered and dialed digit-by-digit. The connection will be setup.

- **Selectservice**

```
Select service
→Tel.ISDN
  Tel.7kHz        ↓
ABORT     ↓      ✓
```
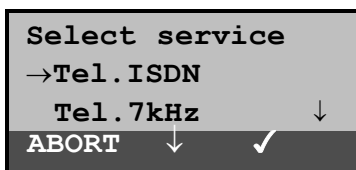
	Operation
< ↓ >	Select the *Service*
< ✓ >	Confirm the *Service* selected and the *B-channel select* entry dialog will open
<ABORT >	Return to the *Single tests* menu

- **B-channel selecten**

```
B-channel select
B-ch:       02
Ch. available.
ABORT        DEL
```

	Operation
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩* ⑩ ⑩#	Enter the *B-channel* (by default, the last B-channel used will be suggested) If you enter an *****, a B-channel that is free will be selected.
< DEL >	Delete the *B-channel* digit-by-digit
< ✓ >	Confirm your selection and the *Outg.call* window will open
<ABORT >	Return to the *Single tests* menu

In the third line, the ARGUS will indicate whether the selected B-channel is available on the access being tested.

• **Connection*.***

```
Outgo.call   Tel.
90700           B02
to: 01191
ABORT
```

	Operation
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩* ⓪ ⑩#	In overlap signaling mode, the call number can only be entered and dialed digit-by-digit (third line)
<ABORT >	Return to the *Single tests* menu

Example display:

First line: Service: *Telephony* (TEL.)

Second line:*Own number* (90700),
                  B-channel used (B02)

Third line: *Number dialed* (01191)

The connection is setup on B-channel 2 status:

```
Connect.     Tel.
90700           B02
to: 01191        ↓
ABORT    TM
```

	Operation
↓ -Key	Display additional call data, e.g., charges
< ABORT >	Disconnect Return to the *Single tests* menu
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)

- **Display additional call data**

If the ARGUS displays a ↓ on the right on the third line, additional information can be viewed by simply pressing a button (τηε ↓−key) :

- **Subaddress**

The sub-address of the caller (second line) and the dialed sub-address will be displayed.

```
Connect.     Tel.
SUB 808076
to: 01191        ↓
ABORT    TM
```

- **User-User Information**

```
Connect.     Tel.
UUS: HELLO
                 ↓
ABORT    TM
```

- **Display Information**
- **Type of number (T.o.n.)**
- **Numbering Plan (NP)**
- **Advice of charge**

The up-to-date AOC information will be presented on the third line of the display as it is received. With the < ↓>, you can scroll through additional information (if there are

	Operation
< ABORT >	Disconnect Return to the *Single tests* menu
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)
↓ -Key	There are other displays

any).

```
Connect.       Tel.
Advice of charge:
Units: 24    ↓
ABORT    TM
```

If the charges are not given in units (the standard in Germany), but rather directly as currency (e.g., in Switzerland and in Austria), the ARGUS will show the current amount in the currency.

If, in DSS1, the call charges are not provided in accordance with the ETS 300 182 standard, rather in the form of the information element DISPLAY (DSP), the DISPLAY message's character string will be displayed.

■ **Procedure for an Incoming Call (ISDN)**

An incoming call can be taken at any time even when a test (e.g. BERT) is in process (see "Starting Several Tests" on page 101).
The ARGUS will signal an incoming call with an audible tone and a message on thedisplay.

```
In.call        Tel.
02351907070    B01
to: 90700       ↓
REJECT   ACCEPT
```

	Operation
<ACCEPT> or 📞-Key	Accept the incoming call
<REJECT>	Reject the incoming call
↓ -Key	Additional information is available (optional: indicated by the ↓ on the display) and can be displayed (e.g., SUB, UUS)

In the example above, the call has been placed from the call number 02351/907070. It is a telephone call. The connection was made using B-channel 1:

The 16-digit call number (DDI) will be displayed in its entirety, as long as the "Alerting mode" in the "Parameter" menu has been set to "manual" (see Chap. 6.9.2.3 Alerting mode page 119).

On a P-MP access, you can use the *Call acceptance* (see "Call Acceptance" on page 125) function to configure the ARGUS to only signal incoming calls which are addressed to the MSN that corresponds to your own call number. This function can only be used when your own call number has been entered into the ARGUS's speed-dialing memory (see "Saving Call Numbers" on page 150) and the incoming call has a destination MSN.

After a call is taken,the followingdisplay will appear:

```
Connect.      Tel.
02351907070   B01
to: 90700       ↓
ABORT    TM
```

	Operation
< ABORT >	Disconnect Return to the *Single tests* menu
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)

A telephone connection to the subscriber with the call number 02351907070 now exists on B-channel 1.
Your own number is 90700.

⚠️ If an external handset has been connected (see "Handset" on page 144), the following will be displayed when the call is accepted:

```
Connect.      Tel.
02351907070   B01
to: 90700       ↓
ABORT    TM
```

	Operation
<Handset>	Switches to the internal handset (necessary in order to take a call, if no headset is connected.)

< ABORT >	Disconnect Return to the *Single tests* menu
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)

Generating Advice of Charge information in NT mode:

If the ARGUS is in NT mode, the ARGUS will – for incoming calls – send advice of charges in accordance with DSS1 as units and as currency (in Euro).

6.6.1.2 Clearing down an ISDN connection

To clear (disconnect) the connection: <ABORT>or

📞-Key

When the ARGUS is clearing the connection or when it has been disconnected, it will display the following:

```
Call clearing
Normal clearing
Loc: User
CONT.
```

	Operation
< CONT. >	Return to the *Single tests* menu

The second line in the display will show the cause (see the table below) of the disconnect.

In the third line, the ARGUS shows the location of the party that initiated the disconnection or where the fault (causing the disconnect) occurred.

If the charges are sent at the end of the connection, the charges will be displayed accordingly.

The connection has now been cleared-down and the B-channel is released.

The following causes are shown in clear text:

Cause	Display	Explanation
255	Active clearing	*User actively initiated the disconnection*
Long 0	Normal clearing	*Cause element with Long 0 is mostly used by 1TR6*
01	Unalloc. number	*"No access under this call number" is signaled*
16	Norm. clearing	*Normal disconnect*
17	User busy	*The number called is busy*

18	No user respond	*No answer from the number called*
19	Call.time XX	*Call time too long*
21	Call reject	*The call is actively rejected*
28	Wrong number	*Wrong call number format or call number is incomplete*
31	Norm. clearing	*Unspecified "normal class" (Dummy)*
34	No B-chan.avail.	*No circuit / B-channel available*
44	Req.chan.unavail	*Requested B-channel not available*
50	Req.fac.not subs	*Requested supplementary service (facility) not subscribed*
57	BC not authoriz.	*Requested bearer capability is not enabled*
63	Srv./opt.n.avail	*Unspecified for "Service not available" or "Option not available"*
69	Req.fac.not impl.	*Requested facility is not supported*
88	Incompat. Dest.	*Incompatible destination*
102	Timer expired	*Error handling routine started due to time-out*
111	Protocol error	*Unspecified for "protocol error class"*
127	Interworking err	*Unspecified for "interworking class"*

Other causes are not shown in clear text, rather as decimal codes (see Appendix B and C).

6.6.1.3 Operation on an analog (a/b) access

■ Procedure for an Outgoing Call (analog)

The ARGUS sets up a connection to another terminal.
If the remote terminal is a telephone, you can use the integrated handset or an optional external headset to hold a conversation with the remote party.

The charges due will be displayed, if the information is available for the access under test.
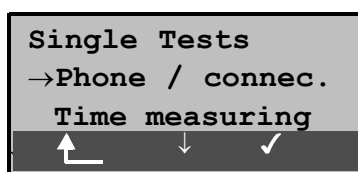
```
 Single Tests
→Phone / connec.
  Time measuring
    ↑⌐    ↓    ✓
```

	Operation
< ↓ >	Select *Phone / connec.*
< ✓ >	Confirm the selection and the *Enter numbers* window will open
↑⌐	Return to the Main menu

```
 Enter numbers
 Overlap sending  ↓

 ABORT  ↓     ✓
```
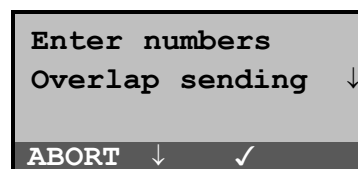
	Operation
< ↓ >	Select overlap or en-bloc signaling
< ✓ >	Confirm your selection and continue to the next display
<ABORT >	Return to the *Single tests* menu

Only with en-bloc signaling:

```
Enter numbers
Destination no. 1
↓
 02351907070
```

	Operation
1 2 3 4 5 6 7 8 9 * 0 #	Enter the number digit-by-digit. The last number dialed will always be used as the default (simplified last number redial)
< DEL >	Delete the number digit-by-digit
< ✓ >	Confirm the number and continue to the next display
↓ -Key or ↑-Key	Scroll through the stored numbers
<ABORT >	Return to the *Single tests* menu

In "**overlap signaling** ", the call is started immediately, the dial tone is audible and the ARGUS is displaying its dialing window. In contrast to en-bloc signaling, you can now enter the call number digit-by-digit using the numeric keypad.

```
Telephony analog
to: 02351907070
 AOC:      45
ABORT        ⊓_
```

	Operation
< ABORT >	Disconnect Return to the *Single tests* menu
< ⊓_ >	Generate a FLASH signal

As soon as the remote party answers, a voice connection will be set up.

The charges will be displayed in the third line, if the access supports this feature.

■ **Procedure for an Incoming Call (analog)**

The ARGUS signals an incoming call both audibly and on the display.

```
In.call          a/b
02351907070


              ACCEPT
```
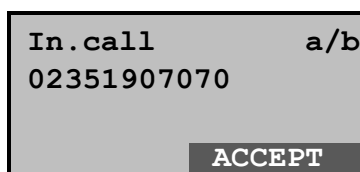
	Operation
< ACCEPT > or 📞-Key	Accept the incoming call

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

After acceptingthe call:

```
In.call          a/b
02351907070


                  ⎍
```
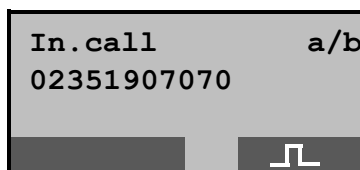
	Operation
<ABORT>	Disconnect and return to the *Single tests* menu
< ⎍ >	Generate a FLASH signal

6.6.2 Time measuring

The ARGUS can measure three different times on a access:
connection setup time, the propagation delay of the data and
the difference between the propagation delays for the data
on two B-channels. Time measurements on a BRI or U
interface access are only possible in TE mode.

```
Single Tests
→Time measuring
---------------↓
   ↰      ↓      ✓
```
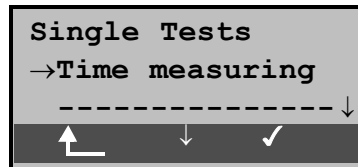
	Operation
↰	Return to the status display
< ↓ >	Select *Time measuring*
< ✓ >	Open the *Time measuring* function

6.6.2.1 Connection setup time

The ARGUS places an outgoing call and measures the time
between sending the SETUP and receiving the ALERT or
CONN.
After the *Connection setup time* function is started, you must
enter the call number, the service and the B-channel (see
"Setting up an ISDN connection" on page 53). The ARGUS
disconnects automatically as soon as the measurement is
completed.

```
Time measuring
→Conn. up time
 B-channel delay ↓
   ↰      ↓      ✓
```

```
Conn. up time
0.458 s    ALERT

ABORT
```

	Operation
↰	Return to the *Single tests* menu
< ↓ >	Select *Conn.up time*
< ✓ >	Open the *Conn.up time* function
	In the second line of the display, the ARGUS will show the measured time in seconds (millisecond exact) and the received L3 message, which terminated the measurement time.
< ABORT>	Quits the *Conn.up time function,* the ARGUS returns to the *Time measuring* menu

If the ARGUS cannot perform the measurement, e.g. because the call number entered was wrong or no B-channel was free, the corresponding cause will be displayed.

6.6.2.2 B-channel delay

The ARGUS places a call to itself (self call) or to a remote loopbox and measures the propagation delay for the data in the selected B-channel. The propagation delay is given in multiples of the time required for sending one byte at 64 kBit/s. (The time for sending 1 byte at 64 kBit/s = approx. 125 µs.)

After the *B-channel delay* function is started, you must enter the call number, the service and the B-channel (see "Setting up an ISDN connection" on page 53). The ARGUS disconnects automatically as soon as the measurement is completed.

```
Time measuring
→B-channel delay
 Interchan.del.↓
  ↰      ↓      ✓
```

```
B-channel delay
 3687 BIT
 34.54 ms
 ABORT
```
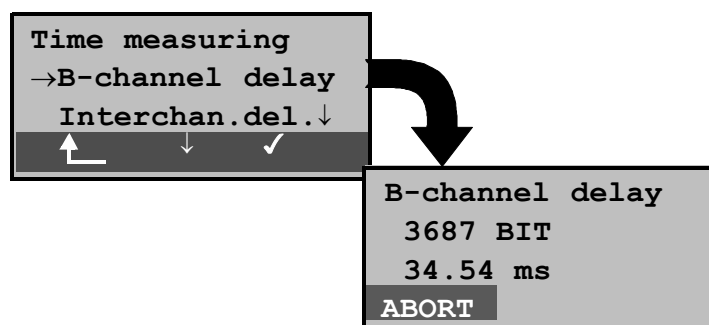
	Operation
↑⌐	Return to the *Single tests* menu
< ↓ >	Select *B-channel delay*
< ✓ >	Open the *B-channel delay* function
	The ARGUS displays the delay in bits (on the second line) and in milliseconds (on the third line).
< ABORT>	Quits the *B-channel delay function,* the ARGUS returns to the *Time measuring* menu

If the ARGUS cannot perform the measurement, e.g. because the call number entered was wrong or no B-channel was free, the corresponding cause will be displayed.

When it is connected to a loopbox, if the ARGUS does not receive the data back within 13 seconds, it will display the message "No LOOP".

6.6.2.3 Interchannel delay

The ARGUS establishes two separate connections to a remote loopbox. The loopbox sends the respective B-channel data back on the same channel. The ARGUS measures the propagation delay for the data on each of the B-channels and determines the difference between the two propagation delays (interchannel delay).

The difference in the propagation delay (interchannel delay) is given in multiples of the time required for sending one byte at 64 kBit/s.

(The time for sending 1 byte at 64 kBit/s = approx. 125 µs.)

After the *Interchannel delay* function is started, you must enter the call number, the service and the B-channel (see "Setting up an ISDN connection" on page 53).

The ARGUS disconnects automatically as soon as the measurement is completed.

```
Time measuring
→Interchan.delay
 --------------↓
  ↑_      ↓      ✓
```

```
Interchan.delay
 27 Bit
 00.41 ms
 ABORT
```
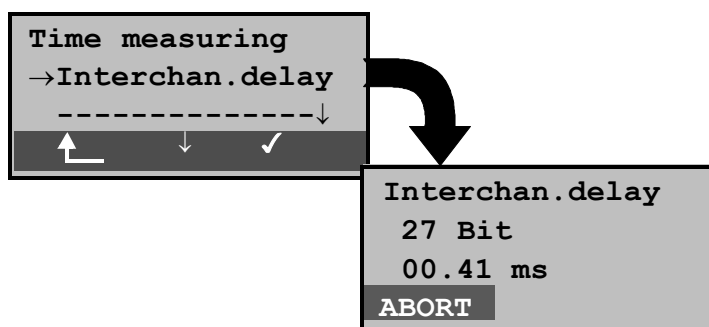
	Operation
↑_	Return to the *Single tests* menu
< ↓ >	Select *Interchan.delay*
< ✓ >	Open the *Interchan.delay* function
	The ARGUS shows the difference in the propagation delays in bits and in milliseconds.
< ABORT>	Quit the *Interchan.delay* function The ARGUS returns to the *Time measuring* menu.

If the ARGUS cannot perform the measurement, e.g. because the call number entered was wrong or no B-channel was free, the corresponding cause will be displayed.

When it is connected to a loopbox, if the ARGUS does not receive the data back within 13 seconds, it will display the message "No LOOP".

6.6.3 Suppl.serv.tests DSS1

The ARGUS checks, which supplementary services are supported by the access being tested.

6.6.3.1 Suppl. Services Test with 1TR6

(only BRI or U interface)

Description

The ARGUS checks, which of the services listed below are supported by the exchange for the BRIor U-interface access (running the 1TR6 protocol) that is being tested:

Sperre	Blocking enabled for outgoing calls
AWS1	Call forwarding type 1 enabled (continuously)
AWS2	Call forwarding type 2 enabled (case by case)
Anschluss GBG	Access belongs to a Closed Users Group
Geb.anzeige	Display of charges is setup
Rufnummern-Id	Setup call number identification - against malicious calls

```
 Single Tests
→Supp.serv.test
  Service test    ↓
    ↰       ↓      ✓
```
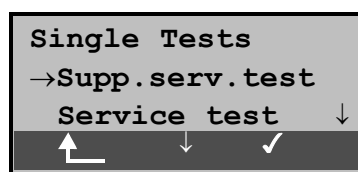
	Operation
↰	Return to the status display
< ↓ >	Select the *Supplementary service test*
< ✓ >	Open the *Supplementary service test* menu

```
Suppl.serv.test



ABORT
```

```
Suppl.serv.test
Sperre          +
AWS           - ↓
CONT.
```
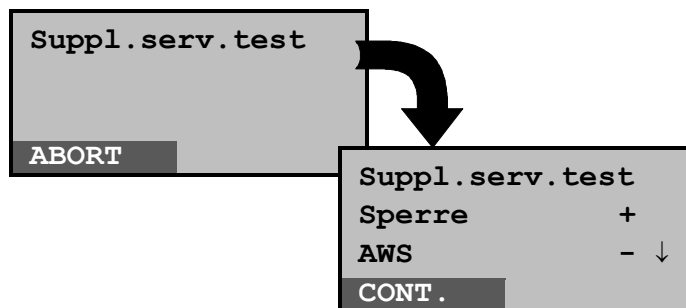
	Operation
<ABORT >	Abort the test Return to the *Single tests* menu As soon as the supplemental services interrogation is finished, the ARGUS will display the results in the second and third lines of the display:
↓ -Key	Scroll through the test results + means that the suppl.service is enabled - means that the suppl.service is not enabled
< CONT. >	Return to the *Single tests* menu

6.6.3.2 Suppl.service interrogation in DSS1

Currently, the ARGUS can individually test the following DSS1 supplementary services:

On a BRI access:

TP	Terminal Portability	Moving the terminal on the bus
HOLD	Hold	Hold/Broker
CLIP	Calling Line Identification Presentation	Display the caller's number
CLIR	Calling Line Identification Restriction	Suppress the caller's number
COLP	Connected Line Identification Presentation	Display the call number of the called subscriber with whom one is connected
COLR	Connected Line Identification Restriction	Suppress the number of the subscriber with whom one is connected
DDI	Direct dialling in	Direct dialling in to an extension on a PBX
CFU	Call Forwarding Unconditional	Forward all calls
CFB	Call Forwarding Busy	Forward calls when busy
CFNR	Call Forwarding No Reply	Forward calls when no answer
CW	Call Waiting	Call waiting
CCBS	Completion of Calls to Busy Subscriber	Automatic callback if party called is busy
CCBS-T	Completion of Calls to Busy Subscriber	Automatic callback if party called is busy (**on P-P**)
CCNR	Call Complete No Response	Automatic recall, if called party does not answer
CCNR-T	Call Complete No Response	Automatic recall, if called party does not answer (**on P-P**)
MCID	Malicious Call Identification	Identification of malicious callers (call tracing)
3pty	Three party	Three party conference
ECT	Explicit Call Transfer	Call transfer or directed call forwarding

AOC	Advice of Charge	Advice of charges
SUB	Sub-addressing	Sub-addressing is possible
UUS	User-to-User Signalling	Transfer of user data

On a PRI access:

On a PRI access, the following supplementary services will be tested:

> **TP, HOLD, CLIP, CLIR, COLP, COLR, CFU, CFB CFNR, CFNR-T, CW, CCBS, CCBS-T, MCID, AOC, SUB, UUS**

```
Single Tests
→Supp.serv.test
 Service test    ↓
 ⬑        ↓      ✓
```

```
Enter numbers
Own number
0235190700
ABORT        DEL
```

	Operation
⬑	Return to the *Main menu*
< ✓ >	Select the *Supplementary service test*
< ↓ >	Confirm your selection The window, *Enter numbers*, will now open.
[keypad]	Enter your **Own number**; the suppl.services test is performed in part with a self call.
< DEL >	Delete individual digits
< ✓ >	Confirm
<ABORT >	Abort the test

Select service:

Select the service, which should be used for the entire suppl. services test

```
Select service:
→Tel.ISDN
  Tel.7kHz        ↓
ABORT              ✓
```

	Operation
↓ -Key	Select the *Service*
< ✓ >	Confirm the *Service* and the *B-channel select* entry dialog will open
<ABORT >	Abort the test

Select Test:

```
Suppl.serv.test
→TP test
  HOLD test       ↓
  ↱      ↓      ✓
```
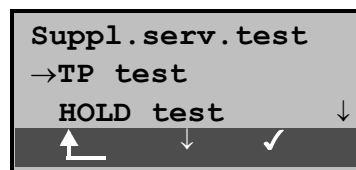
	Operation
< ↓ >	Select a test (e.g. *TP test)*
< ✓ >	Start the test
↱	Return to the *Single tests* menu

■ TP Test

The ARGUS tests the TP (Terminal Portability) supplementary service by making a self call.

```
 Suppl.serv.tests
DSS1
  TP test      +
             MENU
```
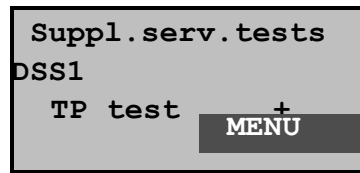
	Operation
	The test results are displayed in the second line:
	+ = TP possible on this access
< MENU >	- = TP not possible on this access
	Return to the *Suppl.serv.test* menu, where you can select the next type of test

■ HOLD Test

For this test, the ARGUS will make a self call.

Result: +   =   HOLD is possible on this access

          -   =   HOLD is not possible on this access

■ CLIP Test (CLIP / CLIR / COLP / COLR)

For this test, the ARGUS will make up to three self calls one after the other. In this test, the ARGUS checks whether the 4 supplementary services CLIP, CLIR, COLP and COLR are supported on the access under test.

The test will be performed automatically for all four supplementary services.
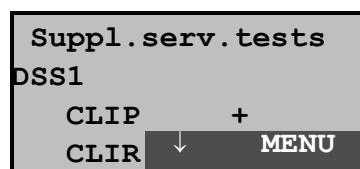
```
 Suppl.serv.tests
DSS1
  CLIP       +
  CLIR   ↓   MENU
```

	Operation
< ↓ >	Scroll through the test results
< MENU >	Return to the *Suppl.serv.test* menu

Test results:

CLIP

Will the calling subscriber's number be displayed at the called subscriber?

- = no   += yes

CLIR

Will the display of calling subscriber's number at the called subscriber be suppressed or is it possible to temporarily suppress the display?

- = no   += yes   * = no statement,

since CLIP is not setup

COLP

Will the call number of the subscriber who answered be displayed on the caller's phone?

- = no   += yes

COLR

Will the display of the call number of the subscriber who answered be suppressed on the caller's phone or is it possible to temporarily suppress the display?

- = no   += yes   * = no statement,

since COLP is not setup

The suppl. services CLIP and CLIR as well as COLP and COLR

will be tested in pairs. If CLIR or COLR is setup permanently, it is **not** possible to make a clear assessment.

■ **DDI Test**

Test results:

Can a caller directly dial in to an extension on the PBX access under test?

- = no   += yes

■ **CF Test (CFU / CFB / CFNR)**

This test checks whether the 3 supplementary services CFU, CFB and CFNR are supported on the access under test. The test is automatically performed for all three supplementary services.

⚠ The CF test attempts to setup a call diversion to the call number that is in the speed-dialing memory location for "destination no. 1". The CF test cannot be performed, if this location does not contain a valid call number to which it is possible to divert a call.
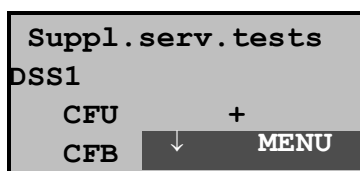
```
Suppl.serv.tests
DSS1
   CFU        +
   CFB    ↓    MENU
```

Operation

< ↓ >   Scroll through the test results

< MENU >   Return to the *Suppl.serv.test* menu

Test results:

CFU

Can this access immediately forward an incoming call?

- = no   += yes

CFB

Can this access forward an incoming call when it is busy; in other words does it support Call Forwarding Busy?

- = no   += yes

CFNR

Can this access forward an incoming call when it is not answered?

- = no   += yes

■ **CW Test**

Test results:

Does the access under test support call waiting?

- = no   += yes

■ **CCBS or CCBS-T Test on a P-P Access**

Test results:

Will the access under test automatically recall a remote subscriber, if the number called was busy?

- = no   += yes

■ **CCNR or CCNR-T Test on a P-P Access**

Test results:

Will the access under test automatically recall a remote subscriber if the call was not answered?

- = no   += yes

■ **MCID Test**

Test results:

Does the access tested allow identification of malicious callers (call tracing)?

- = no   += yes

■ **3pty Test**

Test results:

Does the access under test support a three-party conference call?

For this test, you need the assistance of a remote subscriber, whose call number must be entered.

- = no   += yes

■ **ECT Test**

Test results:

Is an explicit call transfer supported by the access under test?

For this test, you need the assistance of a remote subscriber, whose call number must be entered.

- = no   += yes

■ **AOC Test**

The ARGUS checks whether the charges can be sent to the access under test. The test uses a call to oneself to check both AOC-D (AOC during a call) and AOC-E (AOC at the end of a call).

Test results:

Does the access support AOC?
- = no   += yes

■ **SUB Test**

A call is made to oneself and answered to check the transfer of the sub-address in both directions.

Test results:

Are sub-addresses supported on the access under test?
- = no   += yes

■ **UUS Test**

Test results:

Does the access under test support the transfer of user data?
- = no   += yes

6.6.3.3 Suppl. Services Tests – Error messages

If an error occurs during a suppl.serv.test or if it is not possible to setup a connection, the ARGUS will display the corresponding error code (second line in display) plus the error class in clear text (third line in the display).

```
Suppl.serv.tests
Error:        28
Wrong number
```

In the example, an error with the code 28 has occurred. The error belongs to the error class "wrong or invalid number".
In the table below, you will find that this is an error from the network and that it reports that the call number was incomplete or in the wrong call number format (see "CAUSE-Messages – DSS1 Protocol" on page 166).

Distributing the error codes into error classes:

Error class	Description	Cause (from network) 1 TR6	DSS1	Cause ARGUS internal
A	No or another access	__	__	201,204,205, 210,220
B	Wrong or invalid number	53, 56	1,2,3,18,21 22,28,88	152,161,162, 199
C	One or more B-channels busy	10,33,59	17,34,47	___
D	Wrong service	3	49,57,58,63 65,70,79	___

For further information regarding error codes: "ARGUS Error Messages" on page 170, "CAUSE-Messages – DSS1 Protocol" on page 166 and "CAUSE-Messages – 1TR6 Protocol" on page 168.

6.6.4 Service check

The ARGUS checks, which of the following services are supported by the access under test:

- Tel. analog
- Tel. ISDN (3.1 kHz)
- Tel. 7kHz
- Speech
- 7kHz Audio
- Videotext

- Fax G3
- Fax G4
- UDI 64kBit/s
- Teletext
- Videoconference 1
- Videoconference 2

The test runs automatically.

For each service, the ARGUS will place a call to itself (to the access under test). However, the call will not be answered so no charges will be incurred.

```
Single Tests
→Service check
  BERT test       ↓
```

```
Enter numbers
Own number
↓
0235190700
```

	Operation
⬑	Return to the *Main menu*
< ✓ >	Select *Service check*
< ↓ >	Confirm your selection
The window, *Enter numbers*, will now open:
①②③ ④⑤⑥ ⑦⑧⑨ ⑴*⑩#	Enter your **Own number**, the *Service check* is performed using a self call.
< DEL >	Delete individual digits
< ✓ >	Confirm
<ABORT >	Return to the *Single tests* menu

⚠ There are PBXs that use separate call numbers for incoming and outgoing calls.
In this case, for the Service checks, you can enter a **"remote"** call number that corresponds to the "own" number that is not stored in the ARGUS.

If the Service check should extend outside of the local exchange, it is possible to perform the Service check in an **end-to-end mode**.
In this case, you **must** enter the remote call number for a second terminal device.

The ARGUS will then automatically check whether the remote terminal can accept the call under the various services – in other words, whether it is "compatible" with these services.

In the test results, the second part (second +, - or *) refers to the answer from the **remote** exchange.

Once the test is completed, the ARGUS will display the results:

```
Service Tests
Tel.analog + +
Tel.ISDN   + + ↓
          ↓    MENU
```

	Operation
< ↓ >	Scroll through the test results
< MENU >	Return to the *Single tests* menu

Interpreting the test results:

The ARGUS makes a distinction between outgoing calls (the first +, - or *) and incoming calls (the second +, - or *).

+   Service supported

-   Service not supported

*   result not definite
The reason that it is not possible to make a definite statement is given in the adjacent error code.

Displayed	Description
+ +	The self call functions OK or the remote end can take the call for this service

+ -   Call was sent successfully, however, it was rejected on the remote end due to missing authorization. (Error class D in a B-channel message e.g. in a SETUP_ACK or CALL_SENT)

-   An outgoing call with this service is not possible (Error class D without a B-channel message)

+ *   Call was sent successfully, the call back or call to the remote end failed (e.g., remote end busy or no B-channel available for the call back). (Error class B, C or E in a B-channel message)

*   Wrong number, no B-channel available or other error (Error class B, C or E without a B-channel message)

If the outgoing call is not successful, it is **not** possible to make a statement about an incoming call. Therefore, you will never see "- +" or "- *" on the display.

Example:

```
 ┌─────────────────────────┐
 │ Service Tests           │
 │ Fax G4      +  *63      │
 │ UDI 64kBit + + ↓        │
 │           ↓    MENU     │
 └─────────────────────────┘
```
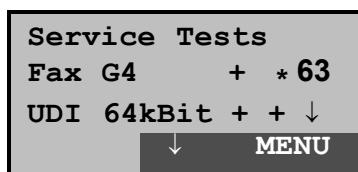
- For outgoing, the Fax G4 service is OK. No statement is possible about incoming.

  The error code 63 gives the coded cause of the error (see the table in the Appendix).

  In this case, it is recommended that you have someone place a call to the access under test using this service.

- The UDI 64kBit service is possible in both directions.

If an error of error class A occurs (see "Suppl. Services Tests – Error messages" on page 81) the Service test will be aborted.

An error of any other error class will coded in decimal (in the example above 63), assigned to the respective service and then displayed.

6.6.5 Bit error test

The bit error rate test (BERT = Bit Error Rate Test) serves to check the transmission quality of the access circuit.

As a rule, the network operator will guarantee an average error rate of 1×10^{-7}, in other words in long-term operation 1 bit error in 10 million transmitted bits. A higher bit error rate will be especially noticeable in transmitting data.

The application program detects the errors in the data blocks transmitted and requests that the remote partner send them again, which reduces the effective throughput of the ISDN connection.

In the bit error test, the tester establishes an ISDN connection to a remote tester or places a call to itself, sends a standardized (quasi-) random number string and compares the received data with that which was sent. The individual bit errors are summed and depending on the test procedure and equipment evaluated in accordance with the ITU Guidelines G.821 and G.826.

Since the bit error test checks both B-channels in both directions at the same time, both B-channels are required.
The duration of the BERT can be set in the *Configuration/ BERT* (see "BERT - duration" on page 127) menu (default setting = 1 minute).

As a rule, the quality of the network operator's access circuits is quite good. Therefore, no bit errors should occur in a 1-minute test.

However, if an error occurs, the test should be repeated with a measurement time of 15 minutes to achieve higher statistical precision. If more than 10 bit errors occur during this 15-minute test (call to oneself), the access circuit is too heavily distorted.

Contact the network operator or the supplier of the PBX equipment and ask them to test your access circuit.

The BERT can be performed in three different ways:

1. BERT in an extended call to oneself

A remote number is not needed, since the ISDN connection is setup to oneself. In this case, the ARGUS requires two B-channels for the test.

2. BERT with a loopbox

A loopbox (e.g., another member of the ARGUS family of testers at the remote end) is required.
The test uses one B-channel.

3. BERT end-to-end

This test requires a waiting remote tester such as an ARGUS in the *BERT wait mode* (see Chap. 6.6.5.2 page 92)*.* A bit pattern is sent to this tester.
Independent of the received bit pattern, the remote tester uses the same algorithm to generate the bit-pattern that it sends back.
Therefore, both directions are tested independently.

6.6.5.1 BERT start

```
Single Tests
→Bit error test
 X.31 test        ↓
      ↑_    ↓    ✓
```
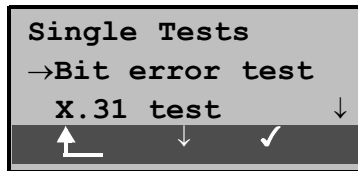
	Operation
↑_	Return to the status display
< ↓ >	Select the *Bit error test*
< ✓ >	Open the *Bit error test* menu

```
Bit Error Test
→BERT start
 BERT wait        ↓
      ↑_    ↓    ✓
```
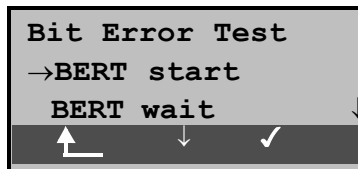
	Operation
↑_	Return to the *Single tests* menu
< ↓ >	Select *BERT start*
< ✓ >	Confirm your selection The window, *Enter numbers*, will now open.
①②③ ④⑤⑥ ⑦⑧⑨ ⓲⓪⌗	Enter your **Own number** to perform the BERT in an extended call to oneself (2 B-channels). or a **remote number** for a BERT to a loopbox (1 B-channel) or end-to-end
< ✓ >	Confirm call number The *Select service* window will now open.
< ↓ >	Select the service under which the connection should be setup
< ✓ >	Confirm the selection and the *B-channel select* dialog will open.
< ↓ >	Select B-channel for connection (enter an * to select any free B-channel)

< ✓ >	Start the bit error test
<ABORT >	Return to the *Single tests* menu

After the ARGUS has setup the connection and synchronized the send and receive directions, it will display the B-channel used (line 1: here B02) , the remaining test time in hours:minutes:seconds, the number of bit errors that have occurred (line 2) and the synchronicity of the bit pattern (line 3 - synchronous or asynchronous).

```
BERT              B02
15:45:42           3
Synchronous
ABORT   TM   ERROR
```

Operation

< ERROR >	Injects an "artificially generated" bit error, which can demonstrate the reliability of the measurements when running end-to-end tests
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)
<ABORT >	Abort the bit error test

⚠ When a bit error is detected, this will be signaled by a brief alarm; in the event that the synchronisation is lost, a constant alarm will sound.

The measurement time for the BERT can be specified with the *Configuration* function (see Chap. 6.9.3.1 BERT - duration page 127).

After the test is done, the ARGUS will display the cause on the second line and the location which initiated the disconnect will be shown on the third line.
If the test ran normally, the ARGUS will display "Active clearing" on this line. *.*

```
Call clearing
Active clearing
Loc.: user    ↓
CONT.
```

Operation

< CONT. >   Display the test results

```
BERT          B02
Result:10309kB
10        9.7E-07 OK
MENU     TM     MORE
```

Operation

< MORE >   Display additional test results

< MENU >   Return to the Bit error test menu

< TM >   Call the Test Manager (see "Menu: Test Manager" on page 100)

Display results:

First line: B-channel used (in the example B-channel 2)

Second line: Transferred data in kBits (in the example 10309 kBits)

Third line: Number of the bit errors that have occurred (in the example 10)
                Bit error rate (in the example $9.7 \cdot 10^{-7}$ (= 0.00000097))
                The evaluation of the results depends on the error threshold that you set (see "BERT - Setting the Error Level" on page 129).
                OK = bit error rate is less than the error threshold (set by the user) and NO = bit error rate is above the error threshold.

Furthermore, it is possible to display more characteristic

values (<MORE> softkey), the ARGUS determines the following in accordance with the ITU-T G.821 and G.826:

HRX   (G821 and G826)
Defines the hypothetical reference connection
The HRX for G.826 cannot be set separately, it corresponds to the HRX for G.821.

EFS   *Error Free Seconds* (G.821)
All the seconds in which no error occurred.

ES821 *Errored Seconds* (G.821)
All the seconds in which one or more errors occurred.

SES821 *Severely Errored Seconds* (G.821)
All the seconds in which the bit error rate is $>10^{-3}$.
In one second, 64,000 bits are transferred, thus **B**it**ER**ror=10^{-3} equates to 64 bit errors.

US   *Unavailable Seconds* (G.821)
All the sequentially adjacent seconds (at least 9 sec) in which **BER**$>10^{-3}$.

AS   *Available Seconds* (G.821)
All the sequentially adjacent seconds (at least 9 sec) in which **BER**$<10^{-3}$.

DM   *Degraded Minutes* (G.821)
All the minutes in which the bit error rate is $>10^{-6}$. In one minute, 3,840,000 bits are transferred, thus a BER = 10^{-6} corresponds to 3.84 bit errors (3 errors = NO (no DMs), 4 errors = OK (DM)).

LOS   *Loss of Synchronisation*
Synchronisation is lost at an error rate > or = 20% within a second. The absolute number of synchronisation losses will be shown.

EB   *Errored Block* (G.826)
Block with one or more errors

ES826 *Errored Second Rate* (G.826)
Seconds with at least one block error

SES826 *Severely Errored Second Rate* (G.826)
Seconds with many errors, i.e. more than 30% of the blocks have errors or at least one SDP (see below)

BBE   *Background Block Error Rate* (G.826)

Background block error rate: The ratio of the defective blocks to the total number of blocks in the measured period without counting the SES blocks

SDP *Severely disturbed Period* (G.826)
Severely disturbed period due to the occurrence of errors (LOS,LOF,AIS,.....) or an "out of service" BER $>= 10^{-2}$.

All the values are displayedin % (percentages).

```
BERT            B02
HRX G821:  15% OK
HRX G826   15% ↓
MENU      TM
```

	Operation
< MENU >	Return to the *Bit error test* menu
↓ -Key	Scroll through the test results
<SIMPLE>	Return to the display of the "Simple" evaluation
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)

The ARGUS evaluates whether the test results satisfy the limits specified in the CCITT G.821 and G.826 under consideration of the defined hypothetical reference connection HRX (displaying OK or NO).

6.6.5.2 Bert wait

For this operation mode, it is necessary to use the *BERT start* function in an end-to-end test.

The ARGUS first waits for a call and then sets up the connection.
During the connection, the received bit pattern will be evaluated and an additional independent bit pattern will be sent.

```
Bit Error Test
→BERT wait
  B-channel loop  ↓
  ↰        ↓       ✓
```

```
BERT
Wait active

ABORT  TM
```
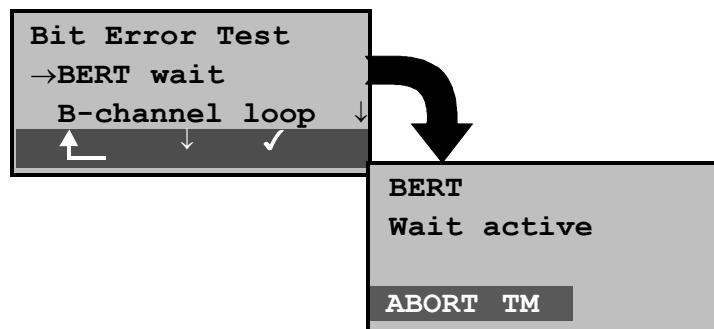
	Operation
< ↓ >	Select *BERT wait*
< ✓ >	Start the *BERT wait* function The ARGUS is in the active *BERT wait* mode.
↰	Return to the *Bit error test* menu
< TM >	Call the Test Manager (see "Menu: Test Manager" on page 100)
< ABORT>	Stop the *BERT wait* function

The ARGUS displays that will appear are the same as those in *Chapter 6.6.5.1 BERT start* .

The time shown is the current amount of time that *BERT wait* has run.

6.6.5.3 B-channel loop

When the B-channel loop function is active, the ARGUS will automatically take an incoming call for any service and switch a loop back in the B-channel that is specified by the exchange.

The received bit pattern will be sent back to the caller/sender.

```
Bit Error Test
→B-channel loop      )
 BERT start          ↓
  ↰       ↓       ✓
```

```
B-channel loop
Wait active

ABORT  TM
```

	Operation
↰	Return to the *Single tests* menu
< ↓ >	Select *B-channel loop*
< ✓ >	Start the *B-channel loop* function The ARGUS is waiting for a call. An incoming call will be taken immediately and switched in a loop to the appropriate B-channel. The ARGUS displays the call number and the B-channel used in the second line.
< TM >	Calls the Test Manager see "Menu: Test Manager" on page 100
< ABORT>	Quit the *B-channel loop* function

The "B-LOOP connect." window, which is similar to the normal connection window, will open:

```
┌─────────────────────────┐
│ B-LOOP         Tel.     │
│  235190700              │
│ B01                     │
│  to: 907070          ↓  │
└─────────────────────────┘
```

Operation	
↓ -Key	Display additional information (e.g. UUS…)
< TM >	Calls the Test Manager see "Menu: Test Manager" on page 100
< ABORT>	**Disconnect** B-channel loop

A second B-channel loop connection can be started via the Test Manager (see "Starting Several Tests" on page 101).

6.6.6 X.31 Test

The X.31 test consists of two steps:

First step: The ARGUS tests whether it is possible to access the X.25 service via the D-channel on the access under test.

The ARGUS sequentially checks all the TEIs from 0 to 63. All the TEIs with which the X.31 service is possible on Layer 2, will be shown on the display.

Second step: For each TEI with which X.31 is possible on Layer 2, a CALL_REQ packet will be sent and then the ARGUS will wait for an answer.

Beforehand, the ARGUS will request the entry of the X.25 access number, which will be saved in speed-dialling memory under *X.31 test number* ("Saving Call Numbers" on page 150).

With the entry of the X.25 access number, you can - if you wish - select a logical channel (LCN) other than the default. For this purpose, append a "#" plus desired the LCN to the access number (default: LCN = 1).

```
 Single Tests
→X.31 Test
 CF interrogation
   ⬑      ↓      ✓
```

```
 X.31 TEI test
 TEI:03 02  +    ✎
 ABORT      NEW
```

	Operation
< ↓ >	Select *X.31 test*
< ✓ >	Confirm your selection
⬑	Return to the *Main menu*
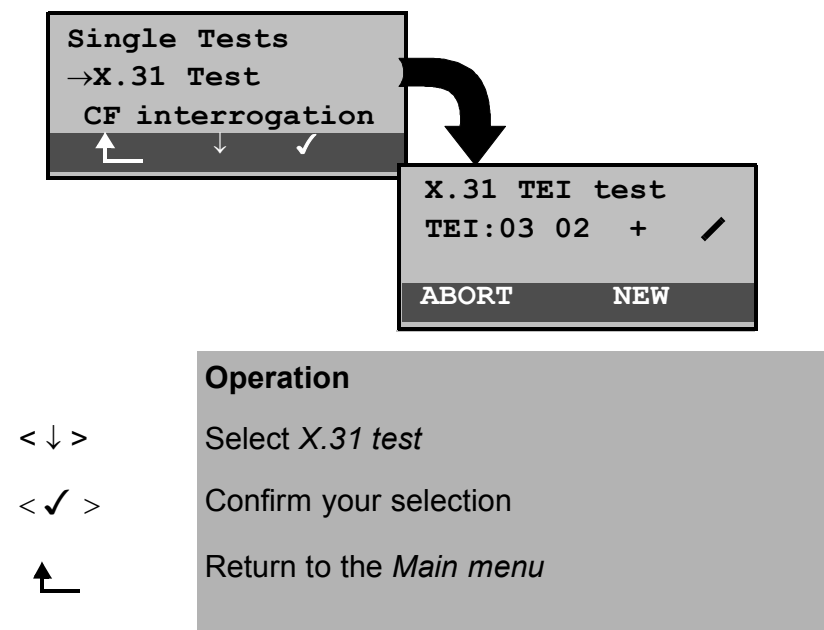
	The test can take up to 4 minutes during which the ARGUS will display a rotating bar. In the second line, beginning at the left, you will find the just tested TEI and its result: + = X.31 is available for this TEI - = X.31 is not available for this TEI
`<ABORT >`	Stop the test and return to the *Single tests* menu
`< NEW >`	Repeat the X.31 test

After the test sequence is completed, the ARGUS will show whether the X.31 service is available for Layer 3 for the TEIs found in Step 1.

```
X.31 TEI test
TEI:02 + +
TEI:03 + - 13 67
MENU        ↓      NEW
```

	Operation
`< ↓ >`	Scroll through the test results
`< MENU >`	Return to the *Single tests* menu
`< NEW >`	Repeat the X.31 test

Test results:

TEI 02 = the first valid TEI value is 02.

+ + = Both test steps were successful

+ -   = 1. test step successful, second step not. In this case, the ARGUS will display the relevant X.31 cause for the failure (in the example above: 13) and an associated diagnostic code (in the example: 67), if there is one.
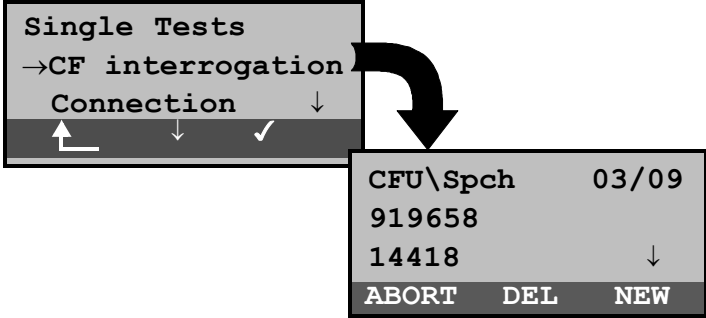
If the X.31 service is not available, the ARGUS will show the message "`X.31(D)n. impl.`".

6.6.7 CF interrogation (only on a BRI access)

The ARGUS will check whether a call diversion is setup in the exchange for the access under test.
After the test, the ARGUS will show the type of diversion (CFU, CFNR or CFB) and the call diversion's service. The display is limited to a maximum of 10 call diversions for all of the MSNs.

Any call diversion setup in the exchange can be cleared with the ARGUS.

```
┌──────────────────────────┐
│ Single Tests             │
│→CF interrogation         │
│  Connection        ↓     │
│  ▲__      ↓      ✓        │
└──────────────────────────┘
          ┌──────────────────────────┐
          │ CFU\Spch         03/09    │
          │ 919658                    │
          │ 14418              ↓      │
          │ ABORT    DEL     NEW      │
          └──────────────────────────┘
```

	Operation
< ↓ >	Select *CF interrogation*
< ✓ >	Confirm your selection
▲__	Return to the *Main menu*
	The test can take a few seconds, during which a bar will rotate on the display.
↓ -Key	Scroll through the test results
< DEL >	Clear the displayed call diversion
< NEW >	Repeat the CF interrogation

Example test results:

1. line:	This is a CFU call diversion for the Speech service (Spch see the table page 99) It is the third call diversion shown of a total of 9 found.
2. line:	Diversion to own number (in the example: 919658)
3. line:	Destination number for the diversion (in the example: 14418)

Clearing a call diversion

After you press `<DEL>`, a query will appear asking whether you are sure.

```
CFU\Spch      03/09
919658
Are you sure?
ABORT     DELETE
```

	Operation
< DELETE >	The ARGUS clears the displayed call diversion in the exchange.
<ABORT >	Abort the process; the displayed call diversion will not be cleared

When the diversion is cleared correctly in the exchange, the following will be displayed:

```
CF
deactivated

CONT.
```

If the call diversion could not be cleared, the ARGUS will report:

```
CF
not changeable

CONT.
```

Some PBXs or exchanges do not permit the use of the mechanism used (by the ARGUS) for the CF test for all MSNs or they return a negative acknowledgement of the CF interrogation, implying that no CF was setup.

Therefore, in the event of a negative acknowledgement, the ARGUS will request that you enter your **own** MSN.

The CF interrogation will be repeated **MSN-specific**.

Naturally, in this case, the results of the CF test only apply for the entered MSN and **not** for the entire access.

Abbreviations used for the services and service groups on the display:

Basic Service	Abbreviation
All services	`All`
Voice (speech)	`Spch`
Unrestricted digital information	`UDI`
Audio 3.1 kHz	`A3k1H`
Audio 7 kHz	`A7khz`
Telephony 3.1 kHz	`Tel31`
Teletext	`TTX`
Fax Group 4	`FaxG4`
Video syntax based	`ViSyB`
Video Telephony	`ViTel`
Telefax Groups 2/3	`FaxG3`
Telephony 7 kHz	`Tel7`
Data Comm. 64kBit	`DFU`
Unknown Basic Service	`Unkno`

6.7 Menu: Test Manager

The ARGUS can simultaneously start   twotests or "connections" fully independently of each other.
As an example, a BERT can be run at the same time that you make a phone call. The individual tests or "connections" use resources.

All of the tests that have been started will be administered by the Test Manager. Using the Test Manager you can start new tests, switch between tests running in parallel or terminate all of the tests that are currently running.

Calling the Test Manager in the Main menu:

```
ARGUS10 BRI
→Test Manager
  Automatic tests
  ↑        ↓        ✓
```

```
Tests      -/00 B--
→Start new one
  Cancel all ↓
  ↑        ↓        ✓
```
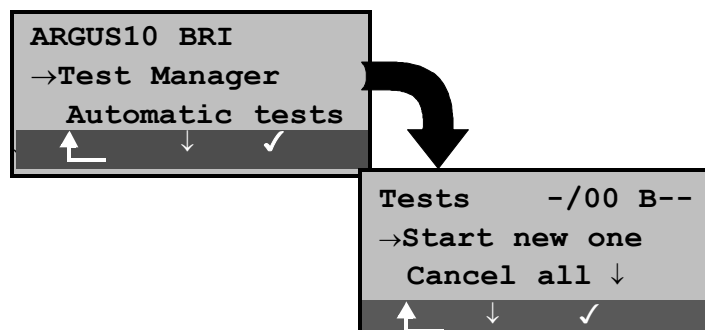
	Operation
< ↓ >	Select the *Test Manager* menu
< ✓ >	Confirm your selection
↰	Return to the status display
< ↓ >	Select the desired menu item e.g. *Start new one* The ARGUS displays the number of the selected test, the number of tests started and the B-channel used by the selected test. (-/00 B--)
< ✓ >	Confirm
↰	Return to the Main menu

⚠ If the ARGUS is in the Connections or Single tests menu or one of their functions, the Test Manager can be opened using the **6-Key** or via the < TM >softkey.

6.7.1 Starting Several Tests

■ **Starting a new test or connection during an existing connection**

The ARGUS has an existing connection (see Chap. 6.6.1.1 Setting up an ISDN connection page 53). Open the Test Manager (6-Key or < TM >).

	Operation
< ↓ >	Select the *Start new one* function
< ✓ >	The ARGUS jumps to the status display
⬏	Returns to the existing connection
	The ARGUS jumps to the Main menu from which you can start other tests as usual.

```
ARGUS10 BRI
→Single tests
 Automatic Test  ↓
  ⬏       ↓      ✓
```
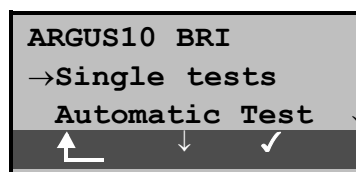
Start another test, e.g. the bit error test from the Single tests / Bit error test menu (see Chap. 6.6.5.1 BERT start page 87) . Similar to Chap. 6.6.5.1, the ARGUS will perform a bit error test independent of the currently existing connection.

```
BERT          B02
15:45:42       3
Synchronous
ABORT   TM   ERROR
```
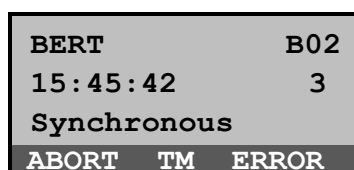
	Operation
< TM >	The ARGUS jumps to the Test Manager

<ABORT >	Cancels the bit error test and displays the BERT results. In the BERT results window, press the <TM> softkey to return to the Test Manager.

■ **Cancelling the Test**

If a test (or connection) is cancelled, the ARGUS will return to the Test Manager if there are any other tests (or connections) running in the background.

All of the existing connections (and/or tests) will be displayed by the Test Manager:

```
Tests      1/03 B02
→BERT
  BERT            ↓
    ↰      ↓     ✓
```
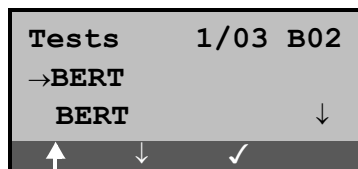
	Operation
< ↓ >	Scrolls through all of the existing connections or tests. The ARGUS displays the B-channel used for the just selected test (in the example a BERT) in the first line. Example: The marked BERT is the first test started (**1**/...) of the two currently running tests (.../**02** ...) and it uses B-channel 2 (....... **B02**)
< ✓ >	The ARGUS will jump to the marked test.
↰	The ARGUS will return to the point from which the Test Manager was called (e.g. to a test running in parallel). If this is not reasonable, because e.g. no other test is running, the ARGUS will return to the Main menu.

⚠ Some tests use so many resources that they cannot be run in every combination with other tests. In this case, the ARGUS will display the message "Test not possible at this time".

Test/ Connection	Number of times that this test/connection can be started at the same time	It is possible to change to another test
Incoming call	2	Yes
Outgoing call	2	Yes
BERT	2	Yes
LOOP	2	Yes
Service Tests	1	No
Suppl.serv.test	1	No
Time measuring *Setting up call*	1	No
Time measurement *B-channel delay*	1	No
Time measurement *Interchannel delay*	1	No
X.31 Test	1	No
CF Interrogation	1	No
Auto. Test	1 When the Auto. Test is running all of the resources are in use and no other tests or connections are possible	No
BRI level	1	No
BRI level, remote end	1	No
U voltage	1	No

U power	1	No
a/b voltage	1	No

■ **Accepting an incoming call/connection during a running test**

The ARGUS signals an incoming call with a corresponding message on the display and an audible signal (see Chap. 6.6.1.1 Setting up an ISDN connection page 53).

The incoming call can be accepted without influencing the currently running test. If the functions *B-channel loop* or *BERT wait* are active, the call will be accepted automatically.

The manner that multiple connections are handled is illustrated in the following example of an incoming call that arrives during a BERT, but it is identical for all other tests.

The ARGUS is performing a bit error test as an incoming call is signaled on the display:

```
In.call          Tel.
02351907070      B01
to: 90700         ↓
REJECT   ACCEPT
```

	Operation
<REJECT>	Reject the incoming call The ARGUS returns to the running test (in the example: to the BERT)
<ACCEPT>	Accept the incoming call. The ARGUS will then jump to the "Connections" dialog. The connection is active and in the foreground. The BERT continues to runs in the background and can be viewed via the Test Manager (6-Key).

6 -Key	The ARGUS jumps to the Test Manager

```
Tests      1/03 B02
→BERT
  Incom. connect.↓
  ↰      ↓      ✓
```

Operation

< ↓ >	Select the *BERT*
< ✓ >	The ARGUS jumps to the BERT
↰	The ARGUS will then return to the "Connections" dialog.

⚠ If available, the internal handset will be assigned to the currently started (voice) connection. There is no support for switching the handset to another voice call. The assignment of the handset to a given connection is also retained in the background.

6.7.2 Switching Between Tests

First call the Test Manager.

```
Tests     2/03 B02
→BERT
 LOOP BOX       ↓
   ↰       ↓    ✓
```
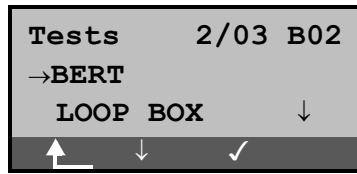
Operation

< ↓ >   Mark the test (connection) that you wish to switch to

< ✓ >   The ARGUS will jump to the selected test.

↰   The ARGUS will return to the point from which the Test Manager was called

6.7.3 Cancel all

First call the Test Manager.

```
Tests     0/02 B--
→Cancel all
 Start new one  ↓
   ↰       ↓    ✓
```
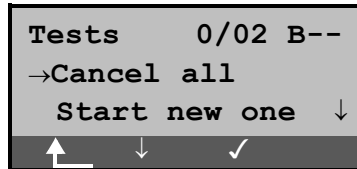
Operation

< ↓ >   Select *Cancel all*

< ✓ >   The ARGUS will cancel all of the currently running tests/connections and then return to the Main menu.

↰   The ARGUS will return to the point from which the Test Manager was called

6.8 Menu: Automatic Test

The ARGUS executes a test sequence automatically.

The test results will be shown in the display.
With the special optional cable (RJ45 to Centronics connector), you can print out a simple test report on a Centronics printer.

The test results can also be saved on a PC and then be viewed and printed as a comprehensive test report

The ARGUS automatically performs the following sequence of tests:

**On a BRI or U-interface access
(ARGUS in TE Mode)**

- Level Measuring
- Service Tests
- BERT in an extended call to oneself
- Suppl.serv.test (tests the supplementary services)
- X.31 Test
- CF Interrogation

On an ISDN permanent circuit

- Level Measuring
- BERT in end-to-end mode (e.g. with a loopbox on the remote end)

The test results and the time will be saved in the ARGUS together with the date (assuming the exchange sent it via the D-channel).
Additionally, settings such as your own plus a remote call number will also be saved.
The test results are stored in non-volatile memory and are not lost when the ARGUS is switched off.

The ARGUS can save the results of several test series (records 1,2,3...).

Each function in the *Automatic test* menu refers to one of the test series saved as a record.

Therefore, the first step will open a dialog in which you must select the desired data record.

```
ARGUS10 BRI
→Automatic Test
 Level measuring ↓
  ⬆⌐      ↓      ✓
```

```
Automatic Test
→1. 24.12. 17:45
 2. 31.12. 23:5↓
  ⬆⌐      ↓      ✓
```

	Operation
< ↓ >	Select *Automatic Test* menu
< ✓ >	Confirm your selection
⬆⌐	Return to the status display
< ↓ >	Select record: Each data record (holding the results of a saved test) is identified by a sequential number plus the date and time "Free" data records have only a number.
< ✓ >	Confirm A menu with various functions for processing the selected data record will open automatically.
⬆⌐	Return to the Main menu

If function key 4 is pressed at any place in the menu to start an automatic test, a data record will be selected automatically and the Automatic test will begin immediately. The result will saved in the first data record that is free (e.g. No.3 when two test series are already saved).

If all of the records are used, the ARGUS will return to the "Autom. Test" menu and request permission to overwrite the oldest test results.

6.8.1 Starting the Automatic Test

```
┌─────────────────────────┐
│ Autom.Test    No.2      │
│ →Start                  │
│   View      ↓           │
│   ▲┘        ↓      ✓     │
└─────────────────────────┘
```
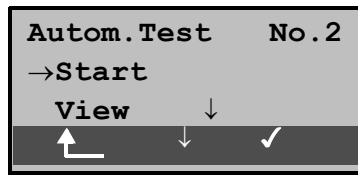
	Operation
< ↓ >	Select *Start*
< ✓ >	Confirm your selection
▲┘	Return to the *Autom. Test*
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ✱ ⓪ #	Enter your **Own number** *Only on accesses with the DSS1 protocol:* also enter a **remote call number**
< ✓ >	Confirm
< ↓ >	Select service (will be used for the suppl.serv.test)
< ✓ >	Start test

⚠ Before running a BERT, check and, if necessary, modify the measurement time and error level (threshold) (see Chap. 6.9.3.1 BERT - duration page 127)..

```
┌─────────────────────────┐
│ Service Tests           │
│ Fax G3      + + ╱        │
│                         │
│ ABORT                   │
└─────────────────────────┘
```
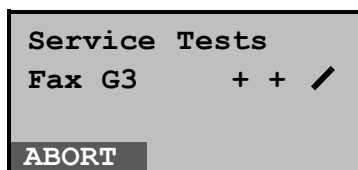
During the test series, the first three lines in the display will reflect the test currently being run. If the test series is canceled (< ABORT> softkey) the following menu will open:

```
┌─────────────────────────┐
│ Autom.Test    No.2      │
│ →Interrupt test         │
│   Stop cur. test   ↓    │
│ CONT.         ↓      ✓   │
└─────────────────────────┘
```
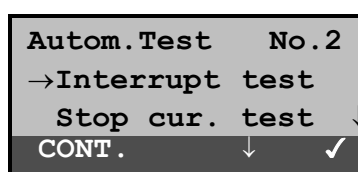
In this menu, you have the option of aborting the entire

currently running series of tests or skipping individual test segments (e.g. service check).

■ **Cancelling the Test**

An automatic test series can be terminated before it is finished:

```
Autom.Test   No.2
→Interrupt test
  Stop cur. test  ↓
  CONT.         ↓    ✓
```
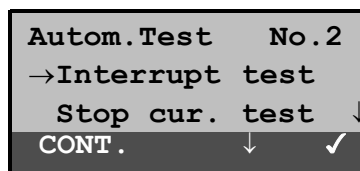
	Operation
< ↓ >	Select *Interrupt test*
< ✓ >	Confirm that the test should be stopped
< CONT. >	Continue the test series

⚠ If the automatic test is interrupted, the test results gathered up to this point will **not** be saved.
Any "old" data stored under this data record number from a prior test will be retained.

■ Test point – skipping

Individual test points can be skipped in the following manner:

```
Autom.Test   No.2
→Stop cur.test
  Select Continue
 CONT.        ↓      ✓
```
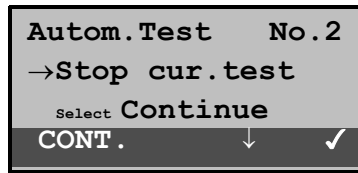
	Operation
< ↓ >	Select *Stop cur. test*
< ✓ >	The test currently being performed will be skipped (e.g. BERT) and the next test in the sequence will start.
< CONT. >	In this case, the interrupted test (e.g. BERT) will be repeated and the test series resumed.

■ Continue test

If you have interrupted a test series with **<ABORT>**, the interrupted series can be resumed. In this case, the interrupted test (e.g. BERT) will be repeated.

```
Autom.Test    No.2
→Continue test
 Interrupt test
 CONT.        ↓      ✓
```
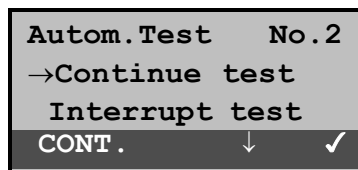
	Operation
< ↓ >	Select *Continue test*
< ✓ >	In this case, the interrupted test (e.g. BERT) will be repeated and the test series resumed.
< CONT. >	The interrupted test will be repeated and the test sequence will continue.

6.8.2 Display result

The ARGUS displays the result of the automatic test .

```
Autom.Test   No.2
→Display result
  Test data to PC
 [↰]         [✓]
```

```
Autom.Test    No.2
B12
U0 P-P  TE  DSS1
ABORT        ✓
```
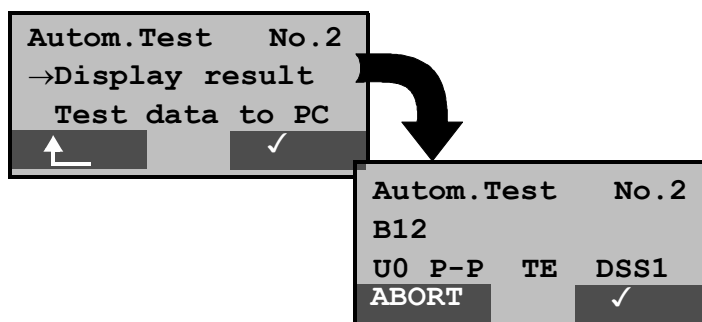
	Operation
< ↓ >	Select *Display result*
< ✓ >	Confirm your selection
↰	Return to the *Autom. Test*
< ✓ >	Continue to the next results window
<ABORT>	Return to the *Autom. Test No.x*

The results of the individual tests will be displayed in the following order:

For: *BRI or U*	*ISDN perm. circuits.*
- Status	Status
- Level measuring	Level measuring
- Service test	BERT
- BERT	
- Suppl.serv.test	
- X.31 test	
- CF Interrogation	

```
Autom.Test   No.2
Tel.ISDN  +*123
Fax G3    ++    ↓
ABORT      CONT.
```
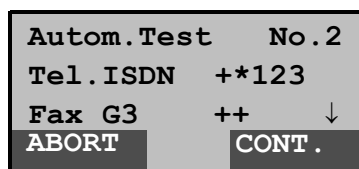
	Operation
< ↓ >	Scroll through the test results
< CONT.>	Jump to the results of the next single test
< ABORT>	Return to the *Autom. Test No.2*

The interpretation of the test results is described in the individual sections (e.g. in Chapter 6.6.4 Service check page 82) .

6.8.3 Sending test data to a PC

To visualize and archive the test results on the PC, the data records can be transferred to the PC via the serial interface using the included cable (connect the cable between the ARGUS "L-Test" jack ---- PC's serial interface) or wireless using the IrDa interface (see "PC Access" on page 149).

Connect the ARGUS to your PC.

■   **Procedure on the PC**

Start *ARGUS WINplus* on the PC.
First select the data record, which should be transferred to the PC (in the following example Test No.2) and then start the transfer of data:

```
Autom.Test    No.2
→Test data to PC
  Print data    ↓
 ⬏              ✓
```
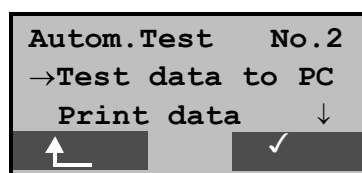
	Operation
< ↓ >	Select *Test data to PC*
< ✓ >	Start transfer of data to PC
⬏	Return to the *Autom. Test*

6.8.4 Printing the test results (optional)

With a special (optional) cable, it is also possible to print a simplified test report on a Centronics printer.

Plug the matching end of the special cable into the *L-Test* jack on the ARGUS. Plug the Centronics connector into the printer.

Now select the data record that you wish to output on the connected Centronics printer (in the following example Test No.2).

```
Autom.Test    No.2
→Print data
  Start
   ⬑            ✓
```
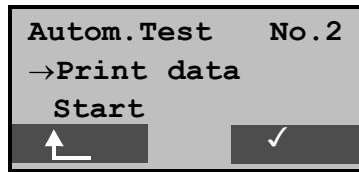
	Operation
< ↓ >	Select *Print data*
< ✓ >	Start printing
⬑	Return to the *Autom. Tests*

While printing, the following will be shown on the display:

```
Autom.Test    No.2
Printing         ╱
ABORT
```
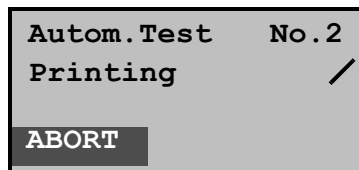
	Operation
< ABORT >	Quit printing

If an error occurs while printing, the ARGUS will show "No reply" in the second line of the display; if the data is transferred properly "Transfer OK" will be displayed.

6.9 Menu: Configuration

```
ARGUS10 BRI
→Configuration
  Level measuring ↓
  ┗         ↓      ✓
```

```
Configuration
→Trace mode
  ISDN           ↓
  ┗      ↓      ✓
```
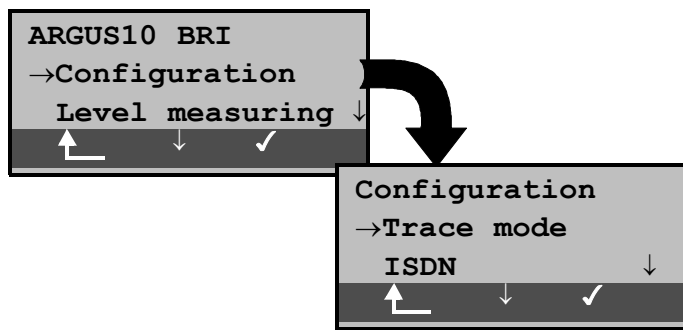
	Operation
< ↓ >	Select *Configuration*
< ✓ >	Open the *Configuration* menu
┗	Return to the status display

6.9.1 Trace mode

The ARGUS passes the recorded D-channel data to the connected PC or saves it in the internal FLASH memory.

```
Configuration
→Trace mode
  ISDN           ↓
  ┗      ↓      ✓
```

```
Trace mode
→Off
  PC access    ↓
  ABORT   ↓    ✓
```
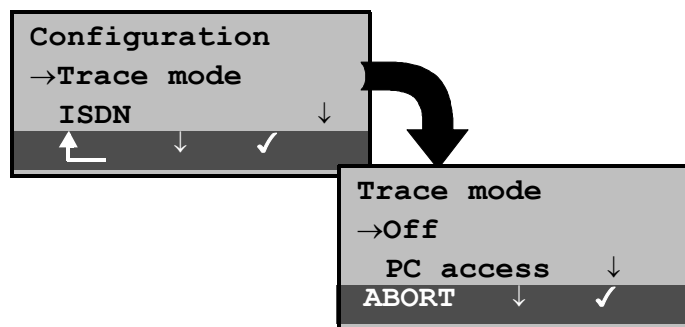
	Operation
< ↓ >	Select the *Trace mode*
< ✓ >	Open the *Trace mode* function
┗	Return to the Main menu
< ↓ >	Select the Trace mode
< ✓ >	Accept settings and return to the *Configuration* menu

`<ABORT >`	Return to the *Configuration* menu without making the changes

⚠ The *Trace mode* setting is only saved temporarily. In other words, Trace mode is always off when the ARGUS is first switched on.

With the setting *Trace mode "On, PC"* , the ARGUS remains active, and sends all of its own D-channel messages and those that it receives from the network to the PC.

When the trace mode is active, the LED labeled "Trace" will be on continuously. If the ARGUS cannot send the data to the PC without errors, the LED will flash at 5Hz (5 times per sec).

In the *Trace mode "On, Recording"*, the ARGUS remains active, but saves the D-channel messages in the internal Flash memory. This trace mode setting is indicated by a slowly flashing the LED (once per sec).

⚠ The D-channel data saved in the FLASH can be loaded to the PC in the "Recorder" mode (see "BRI Recorder" on page 42).

6.9.2 Configuration: ISDN

```
Configuration
→ISDN
  BERT            ↓
  ↰      ↓     ✓
```
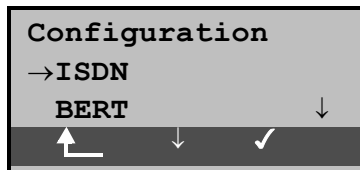
	Operation
< ↓ >	Select the *ISDN config.* submenu
< ✓ >	Open the *ISDN config.* submenu
↰	Return to the Main menu

6.9.2.1 Layer 1 permanent (only on a BRI)

On the ARGUS, you can make Layer 1 (L1) on a **BRI connection in NT mode** permanently active.

```
ISDN config.
→L1 permanent?
  Protocol        ↓
  ↰      ↓     ✓
```

```
L1 permanent?
→No
  Yes                ↓
ABORT      ↓      ✓
```
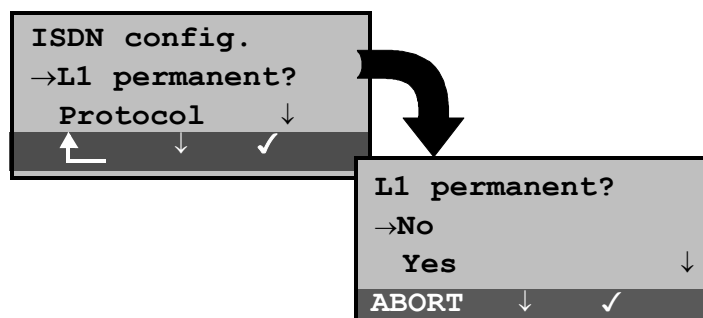
	Operation
< ↓ >	*L1 permanent?* select
< ✓ >	Confirm your selection
↰	Return to the *Configuration* menu
< ↓ >	Select the desired L1 mode.
< ✓ >	Accept settings and return to the *ISDN config.* submenu
<ABORT >	Return to the *ISDN config.* submenu without changing the setting.

6.9.2.2 Select the D-channel protocol

Normally, the ARGUS will use the automatically recognized Layer 3 D-channel protocol.

However, since it is not possible to automatically recognise every protocol, the ARGUS allows you to manually select the protocol:

```
ISDN config.
→Protocol
  Alerting mode ↓
  ↰        ↓      ✓
```

```
    Protocol
  →1TR6
    DSS1              ↓
  ABORT     ↓      ✓
```
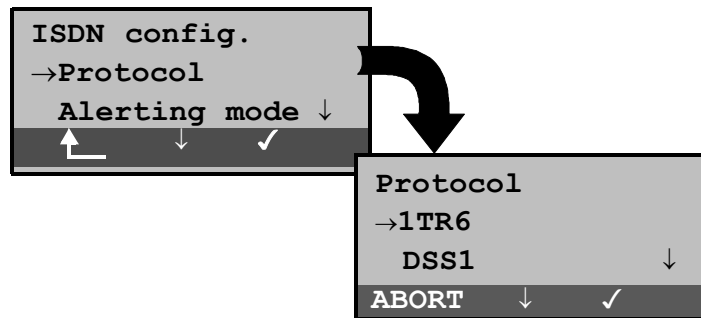
	Operation
< ↓ >	Select the *Protocol*
< ✓ >	Confirm your selection
↰	Return to the *Configuration* menu
< ↓ >	Select the Layer 3 protocol
< ✓ >	Accept settings and return to the *ISDN config.* menu
<ABORT >	Return to the *ISDN config.* menu without changing the setting.

⚠   This setting will not be saved permanently, rather only applies for the current measurement. If the ARGUS is switched off, the setting will be lost.

6.9.2.3 Alerting mode

You can specify whether, for an incoming call on a BRI point-to-point access, the ARGUS should only display the access number without extension or the complete number with extension.

If you **select *Manual***, the extension can be displayed (An incoming call will be signaled. The ARGUS will send the Layer 3 message "Alert" when it accepts the call. The digits of the extension that have been sent by this point will be displayed.).

With the *Manual* setting, an incoming call must be answered within 20 seconds or it will be lost. Furthermore, you should not that the remote subscriber will not hear a ringing tone.

If you select ***Automatic***, the ARGUS will only display the access number without extension or, depending on the configuration of the access in the exchange, it may not display the number called at all.

```
ISDN config.
→Alerting mode
 Clock mode  ↓
    ↰      ↓    ✓
```

```
Alerting mode
→Manual
  Automatic        ↓
ABORT    ↓     ✓
```

	Operation
< ↓ >	Select the *Alerting mode*
< ✓ >	Confirm your selection
↰	Return to the *Configuration* menu
< ↓ >	Select the desired alerting mode.
< ✓ >	Accept settings and return to the *ISDN config.* submenu
<ABORT >	Return to the *ISDN config.* menu without changing the setting.

6.9.2.4 Clock mode

When the ARGUS is operated on a BRI access, you can specify where the clock is generated (regardless of whether the operation mode is TE or NT).

You can either specify that the ARGUS generates the clock (is Master) or that it is the slave of a clock generated at the other end.

In NT-Simulation, the ARGUS is by default *Master*. For a TE-Simulation or a permanent circuit, the default setting is *Slave*.

```
ISDN config.
→Clock mode
   Line resistor   ↓
   ↑        ↓       ✓
```

```
Clock mode
→Master
   Slave          ↓
ABORT    ↓      ✓
```
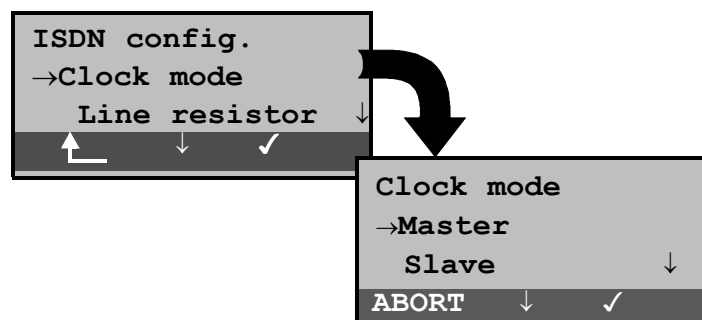
	Operation
< ↓ >	Select the *Clock mode*
< ✓ >	Open the *Clock mode* function
↑	Return to the *Configuration* menu
< ↓ >	Select the desired clock mode
< ✓ >	Accept settings and return to the *ISDN config.* menu
<ABORT >	Return to the *ISDN config.* menu without changing the clock mode.

⚠ This setting will not be saved permanently, rather only applies for the current measurement. If the ARGUS is switched off, the setting will be lost.

6.9.2.5 BRI termination
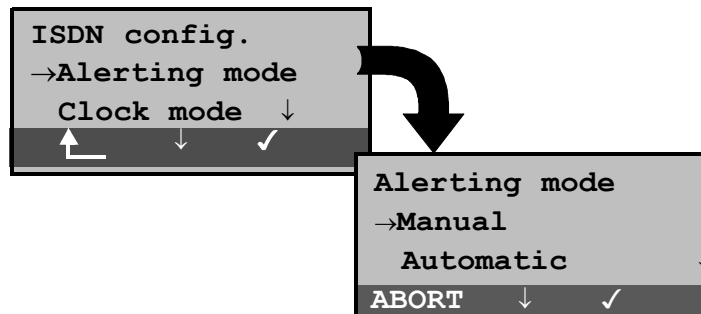
Independent of the operation mode (TE or NT), a terminating resistor can be switched in for the BRI access.

No terminating resistor will be switched in when the Argus is in TE-Simulation mode or on a permanent circuit. In the NT-Simulation mode, the terminating resistors are initially switched on.

```
ISDN config.
→BRI termination
     ↓
  ↱      ↓      ✓
```

```
BRI termination
→ On
  Off              ↓
ABORT     ↓      ✓
```

```
ISDN config.
→Line resistor
  U coding        ↓
  ↱      ↓      ✓
```

```
Line resistor
→ On
  Off              ↓
ABORT     ↓      ✓
```
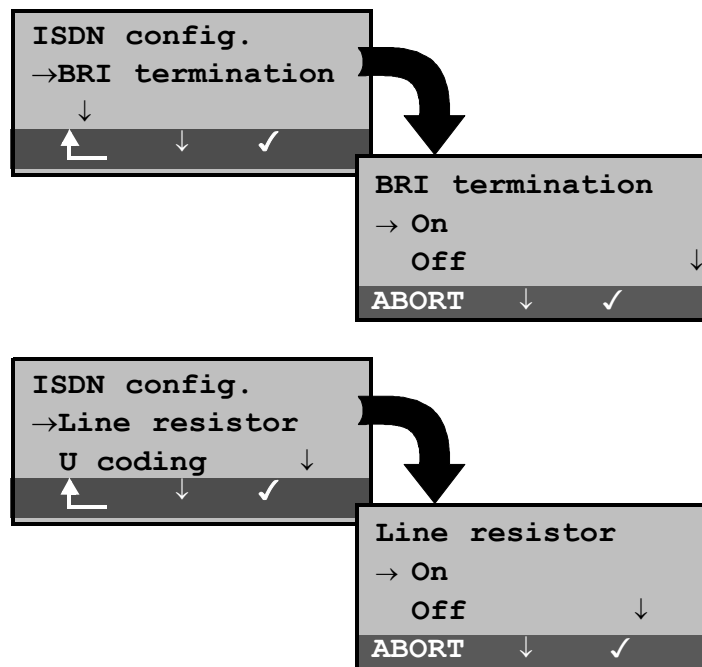
	Operation
< ↓ >	Select *BRI termination*
< ✓ >	Open *BRI termination*
↱	Return to the *Configuration* menu
< ↓ >	Select *On* or *Off*
< ✓ >	Accept settings and return to the *ISDN config.* submenu
<ABORT >	Return to the *ISDN config.* menu without changing the setting.

⚠ This setting will not be saved permanently If the ARGUS is switched off, the setting will be lost.

.   .

	Operation
< ↓ >	Select *PRI termination*
< ✓ >	Open the *PRI termination* function
⬏	Return to the *Configuration* menu
< ↓ >	Select the *value of the terminating resistor*
< ✓ >	Accept settings and return to the *ISDN config.* submenu
<ABORT >	Return to the *ISDN config.* menu without changing the setting.

6.9.2.6 Call Parameter

Two different parameters can be set for (ISDN) calls generated on both the network-side (ARGUS in NT mode) and on the user-side (ARGUS in TE mode):

- **T**ype **O**f **N**umber (TON) for the CGN (=CGPN) or CDN (=CDPN) element of a SETUP signal

- The **N**umbering **P**lan (NP) for the CGN (=CGPN) or CDN (=CDPN) element of a SETUP signal

```
ISDN config.
→Call parameter
  Call acceptance↓
  ⬆      ↓      ✓
```

```
Call parameter
→ Net CGN TON
  Net CGN NP    ↓
  ⬆      ↓      ✓
```

	Operation
< ↓ >	Select *Call parameter*
< ✓ >	Open the *Call parameter* menu
⬆	Return to the *Configuration* menu
< ↓ >	Select desired function: • **Network-side: Net CGN TON /Net CDN TON** **User-side: User CGN TON /User CDN TON** Set the **T**ype **O**f **N**umber (TON) for the CGN or CDN element of a SETUP signal • **Network-side: Net CGN NP /Net CDN NP** **User-side: User CGN NP /User CDN NP** Set the **N**umbering **P**lan (NP) for the CGN or CDN element of a SETUP signal
< ✓ >	Open the selected function
⬆	Return to the *ISDN config.* menu

```
Net CGN TON
→Unknown
  International ↓
ABORT      ↓      ✓
```

	Operation
< ↓ >	Select the desired setting
< ✓ >	Accept settings and return to the *Call parameter* menu
<ABORT >	Return to the *Call parameter* menu without making any changes

Possible settings:

For TON: unknown, international, national, network spec., subscriber, abbreviated.

For NP: unknown, ISDN/telephony , data, telex, national stand., private

6.9.2.7 Call Acceptance

In TE mode on a P-MP access, the ARGUS can either signal all incoming calls or just those calls whose destination address matches the MSN of the access under test.

The function is only available, when your own call number has been saved in the speed-dialling memory under "own number" (see Chap. 6.9.6 Saving Call Numbers page 150) and the incoming call has a destination MSN.

```
ISDN config.
→Call acceptance
  -------------- ↓
   ↑       ↓    ✓
```

```
Call acceptance
→ Only own MSN
   All MSNs
ABORT    ↓     ✓
```

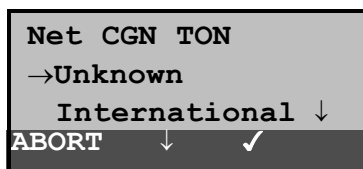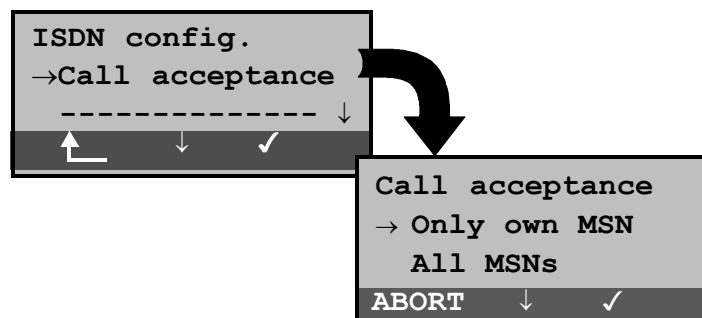|	**Operation**
< ↓ >	Select *Call acceptance*
< ✓ >	Open the *Call acceptance* function
↑_	Return to the *Configuration* menu
< ↓ >	Select the desired setting: ***Only own MSN***: The ARGUS signals the incoming call, if its destination MSN matches your "own" number. ***All MSNs:*** The ARGUS signals all calls
< ✓ >	Accept settings and return to the *ISDN config.* submenu
<ABORT >	Return to the *ISDN config.* menu without changing the setting.

By default, this is set to *All MSNs*.

This setting will be saved permanently.

6.9.3 Configuration: BERT

```
Configuration
→BERT
  Analog              ↓
  ↑        ↓        ✓
```
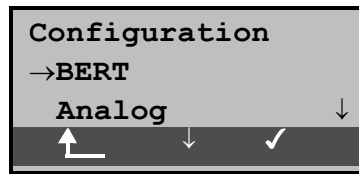
	Operation
< ↓ >	Select the *BERT* submenu
< ✓ >	Open the *BERT* submenu
↑	Return to the Main menu

6.9.3.1 BERT - duration

The default setting for the duration of the bit error rate test is 1 minute. The measurement time may be set to a maximum of up to 99:59 (99 hours and 59 minutes) or an unlimited time (by entering 00:00).

> ⚠ If you select an unlimited measurement time, the test will **not** stop automatically, rather it must be stopped by the user (see Chap. 6.6.5.1 page 87).

```
BERT config.
→BERT time
 HRX value      ↓
   ↰      ↓      ✓
```

```
BERT time
00:12

ABORT    DEL      ✓
```
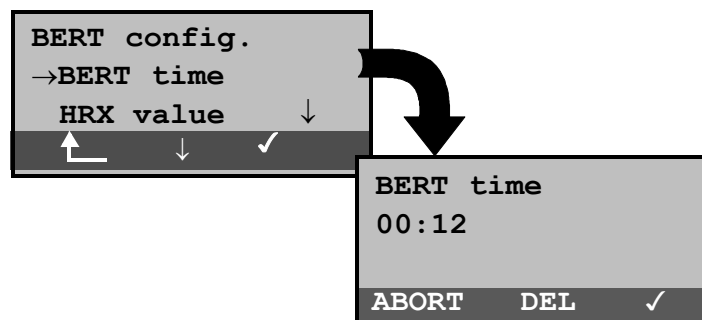
	Operation
< ↓ >	Select *BERT time*
< ✓ >	Open the *BERT time* function
↰	Return to the *Configuration* menu
< DEL >	Delete the digit before the cursor
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑊ ⓪ ⌗	Enter the desired duration of the bit error rate test
< ✓ >	Accept settings and return to the menu *BERT config.*
<ABORT>	Return to the *BERT config.* menu without changing the time.

6.9.3.2 HRX value

Here the HRX value is set in % (**H**ypothetical **R**eference**C**onnections ITU-T G.821):

```
BERT config.
→HRX value
 Error level
    ↰      ↓      ✓
```

```
HRX value
48 %

ABORT    DEL      ✓
```
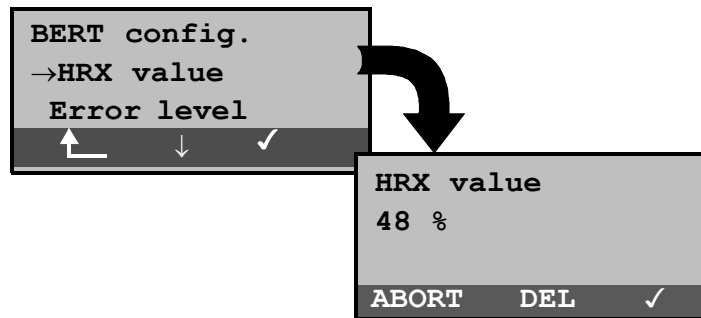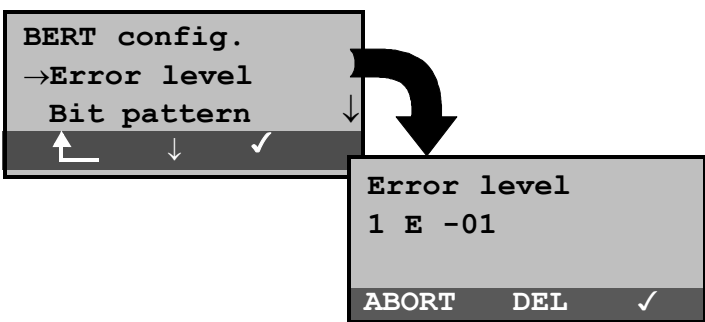
	Operation
< ↓ >	Select *HRX value*
< ✓ >	Open the *HRX value* function
↰	Return to the *Configuration* menu
< DEL >	Delete the digit before the cursor
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑧ ⓪ ⌗	Enter the desired HRX value Values from 0 to 100 %
< ✓ >	Accept the HRX value and return to the *BERT config.* menu.
<ABORT>	Return to the *BERT config.* menu without changing the HRX value.

6.9.3.3 BERT - Setting the Error Level

The default threshold (error level) is 10^{-06}. That means that, in the event that the bit error rate is less than 10^{-06} (one error in 10^6 = 1,000,000 sent bits), the bit error test will be evaluated as OK.

If the bit error rate is greater than the error level value, the ARGUS will display NO. This parameter can be set to any value from 01 (= 10^{-01}) to 99 (= 10^{-99}).

```
BERT config.
→Error level
  Bit pattern        ↓
   ▲_       ↓      ✓
```

```
Error level
1 E -01

ABORT    DEL     ✓
```

	Operation
< ↓ >	Select *Error level*
< ✓ >	Open *Error level* function
▲_	Return to the *Configuration* menu
< DEL >	Delete the digit before the cursor
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ⓧ ⓿ ⌗	Enter desired value for the error level: 01 (= 10^{-01}) to 99 (= 10^{-99})
< ✓ >	Accept settings and return to the *BERT config.* menu.
<ABORT>	Return to the *BERT config.* menu without changing the setting.

6.9.3.4 Selecting the BERT bit pattern

There are two predefined bit patterns available. Additionally, it is also possible to enter a 16 bit long pattern of your choice in binary.

The default pattern is 2^{15}-1.

```
BERT config.
→Bit pattern
----------------↓
  ⬑      ↓      ✓
```

```
Bit pattern
→ 2^11-1
  2^15-1          ↓
ABORT    ↓      ✓
```
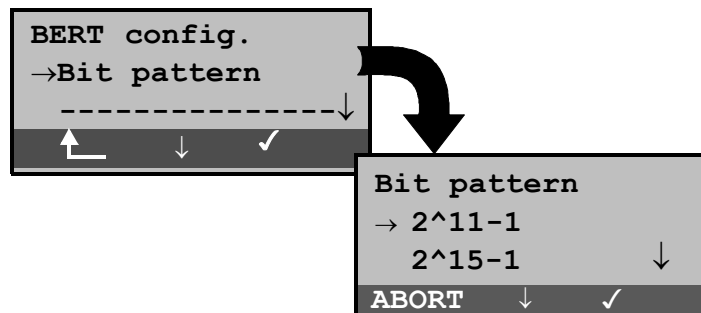
	Operation
< ↓ >	Select the *Bit pattern* function
< ✓ >	Open the *Bit pattern* function
⬑	Return to the *Configuration* menu
< ↓ >	Select the desired bit pattern
< ✓ >	Accept settings and return to the *BERT config.* menu.
<ABORT >	Return to the *BERT config.* menu without changing the settings.

If a "user defined" bit pattern is selected, an entry mask will be displayed.
A 16 bit long pattern can be entered here in binary.
In the BERT, the ARGUS will then either send this bit pattern cyclically or compare it with the received bit pattern.

```
Bit pattern
Enter:
0011010000111001
ABORT        ←        ✓
```

Operation

< ← >   Moves the cursor to the left. The digit selected by the cursor can be directly overwritten.

①②③
④⑤⑥   Enter the desired bit pattern in binary
⑦⑧⑨
✳⓪#

< ✓ >   Accept the bit pattern and return to the *BERT config.* menu. .
The entered bit pattern will be stored in the non-volatile memory (EEPROM), so that it will still be available after the ARGUS has been switched off and back on.

<ABORT >   Return to the *BERT config.* menu without changing the bit pattern.

6.9.4 Configuration: Analog

```
Configuration
→Analog
  ARGUS        ↓
     ↑__    ↓     ✓
```
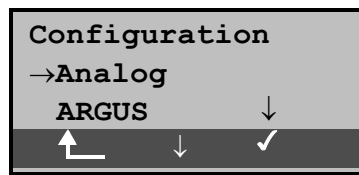
	Operation
< ↓ >	Select the *Analog config.* submenu
< ✓ >	Open the *Analog config.* submenu
↑__	Return to the Main menu

6.9.4.1 Analog dial mode

On an analog access, there are two methods available for dialing (DTMF and pulse dialing):

```
Analog config.
→Analog dial
  Analog CLIP ↓
     ↑__    ↓     ✓
```

```
Analog dial mode
→DTMF
  Pulse mode
ABORT    ↓     ✓
```
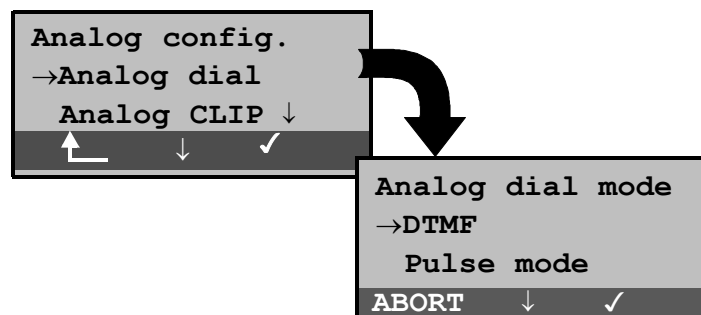
	Operation
< ↓ >	Select the *Analog dial mode* function *.*
< ✓ >	Open the *Analog dial mode* function
↑__	Return to the *Configuration* menu
< ↓ >	Mark the desired dialing mode.
< ✓ >	Confirm the entry and return to the *Analog config.* menu.
<ABORT >	Return to the *Analog config.* menu without changing the dialing mode.

6.9.4.2 Analog CLIP

With the ARGUS, you can choose from two different methods for transferring the call number on an analog access:

- **FSK** CLIP via a method similar to a modem: for Germany as well as some other parts of Europe
- **DTMF** CLIP via DTMF: for Scandinavia and the Netherlands The ARGUS will automatically detect that a CLIP was sent using DTMF *with the polarity reversal* and will set itself accordingly (e.g. Netherlands).

```
Analog config.
→Analog CLIP
  DTMF parameter↓
   ↰        ↓      ✓
```

```
Analog CLIP
→FSK
  DTMF                 ↓
ABORT       ↓       ✓
```
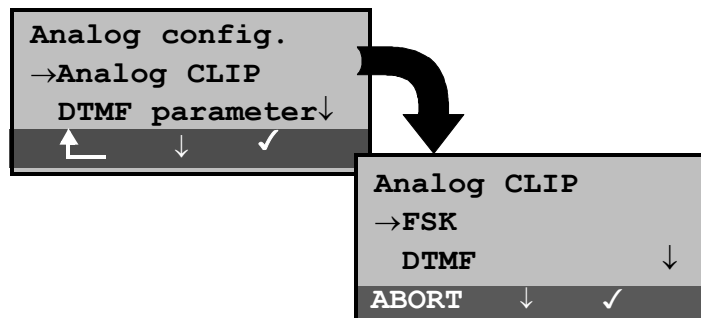
	Operation
< ↓ >	Select the *Analog CLIP* function
< ✓ >	Open the *Analog CLIP* function
↰	Return to the *Configuration* menu
< ↓ >	Select the desired CLIP method
< ✓ >	Confirm the entry and return to the *Analog config.* menu
<ABORT >	Return to the *Analog config.* menu without changing the selected setting.

6.9.4.3 Analog message

The ARGUS can interpret messages received on an analog access (assuming that they are known and free of errors) or transparently display them.

```
Analog config.
→Analog message
  AOC pulse
  ↑      ↓      ✓
```

```
Analog message
→Interpret
  Transparent    ↓
ABORT     ↓      ✓
```
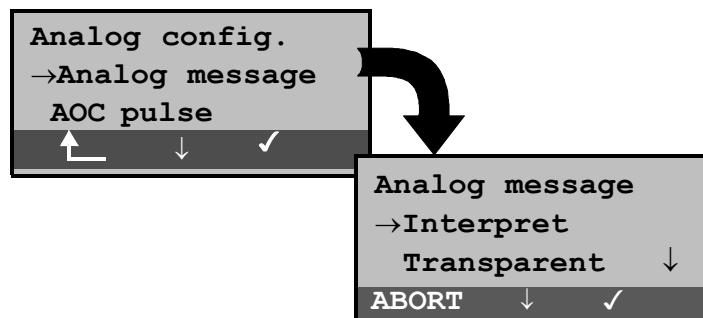
	Operation
< ↓ >	Select the *Analog message* function
< ✓ >	Open the *Analog message* function
↑	Return to the *Configuration* menu
< ↓ >	Select the desired setting
< ✓ >	Confirm the entry and return to the *Analog config.* menu
<ABORT >	Return to the *Analog config.* menu without changing the selected setting.

6.9.4.4 AOC pulse

On an analog access, the country-specific AOC pulse can be selected (12 or 16 kHz).

```
Analog config.
→AOC pulse
  DTMF parameter↓
  ⬆      ↓      ✓
```

```
        AOC pulse
        → 12 kHz
          16 kHz
        ABORT    ↓      ✓
```
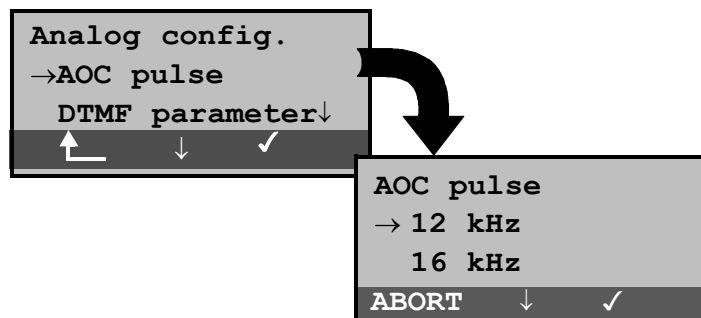
	Operation
< ↓ >	Select the *AOC pulse*
< ✓ >	Confirm your selection
⬆	Return to the *Configuration* menu
< ↓ >	Select *12kHz* or *16kHz*
< ✓ >	Confirm the entry and return to the *Analog config.* menu
<ABORT>	Return to the *Analog config.* menu without changing the selected setting.

6.9.4.5 DTMF parameter

The ARGUS can set the parameters *Level*, *Duration* and *Interval* of the DTMF signals that are generated during analog operation.

```
Analog config.
→DTMF parameter
  FLASH time      ↓
   ↰        ↓      ✓
              DTMF parameter
              →Level
                Time          ↓
                 ↰       ↓       ✓
```
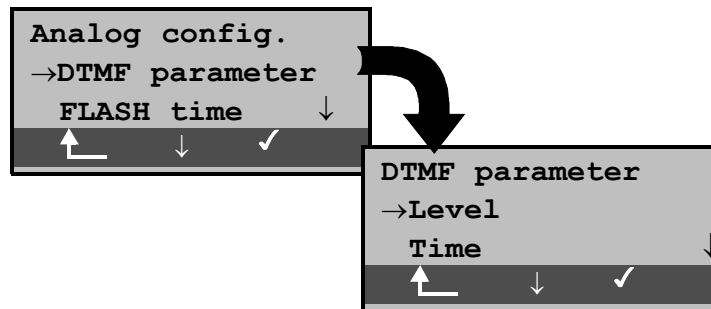
Operation	
< ↓ >	Select the *DTMF parameter* function
< ✓ >	Open the *DTMF parameter* function
↰	Return to the *Configuration* menu

Setting the DTMF level:

The default value is 0dB. The level can take a value between -21dB and +12 dB and can be raised or lowered by 3dB.

```
DTMF parameter
→ Level
  Time            ↓
   ↰       ↓       ✓
              DTMF level
                0 db

              ABORT    ↑      ✓
```
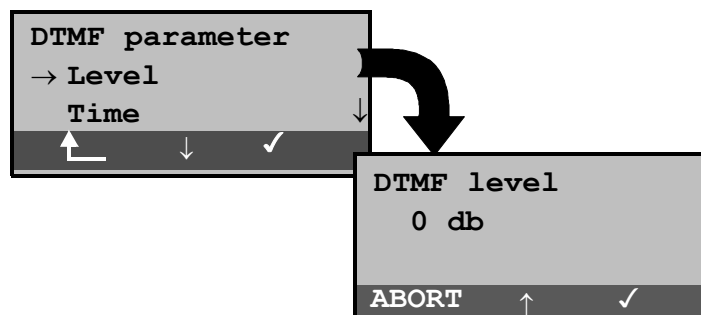
Operation	
< ↓ >	Select the *Level* function
< ✓ >	Confirm your selection
↰	Return to the *Analog config.* menu
↓ -Key	To lower the level by 3dB

< ↑ > or ↑-Key	To raise the level by 3dB
< ✓ >	Accept settings and return to the *DTMF parameter* submenu
<ABORT>	Return to the *DTMF parameter* submenu without making the changes

Setting the duration of the DTMF signal:

The default setting is 80ms. The duration of the signal can take a value between 40ms and 1s. The duration can be raised or lowered using the arrow keys as follows:

In the range 40...200ms	in 10ms increments
In the range 200...300ms	in 20ms increments
In the range 300...1000ms	in 100ms increments

When the upper limit is reached (1000ms), the softkey < ↑ > will automatically change to a < ↓ > and vice versa when the lower limit (40ms) is reached.

```
DTMF parameter
→Time
 Interval ↓
 ↰      ↓      ✓
```

```
              DTMF time
                80 ms
              ABORT   ↑      ✓
```
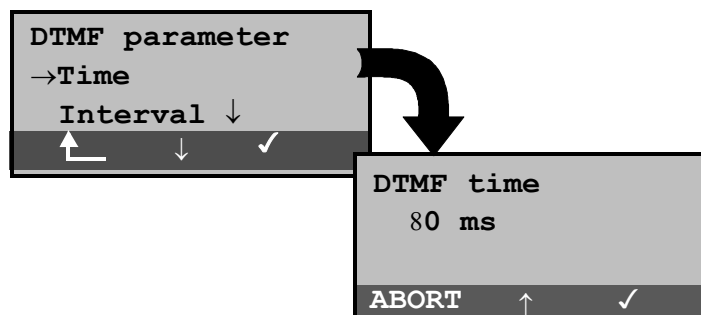
	Operation
< ↓ >	Select the *Time*
< ✓ >	Confirm your selection
↰	Return to the *Analog config.* menu
↓ -Key	Lower the duration
< ↑ > or ↑-Key	Increase the duration
< ✓ >	Accept settings and return to the *DTMF parameter* submenu
<ABORT>	Return to the *DTMF parameter* submenu without making the changes

Setting the interval between two DTMF characters:

The default value is 80ms. The interval between two DTMF characters can take a value between 40ms and 1s. The interval can be raised or lowered by using the arrow keys as follows:

In the range   40...200ms   in 10ms increments
In the range   200...300ms   in 20ms increments
In the range   300...1000ms   in 100ms increments

When the upper limit is reached (1000ms), the softkey < ↑ > will automatically change to a < ↓ > and vice versa when the lower limit (40ms) is reached.

```
DTMF parameter
→Interval
  Defaults ↓
   ⌐        ↓       ✓
```

```
DTMF interval
  40 ms

ABORT      ↑        ✓
```
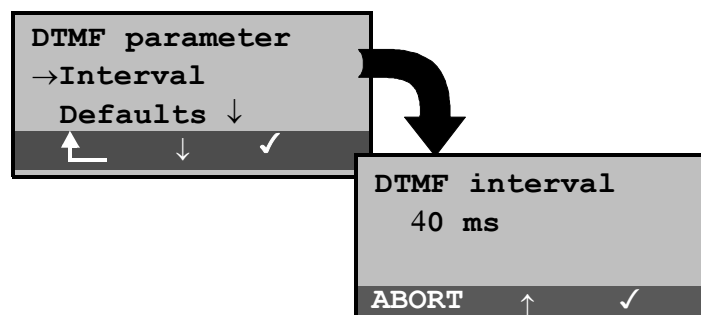
	Operation
< ↓ >	Select the ***DTMF interval*** *function*
< ✓ >	Confirm your selection
⌐	Return to the *Analog config.* menu
↓ -Key	Lower the *DTMF interval*
< ↑ > or ↑ -Key	Raise the *DTMF interval*
< ✓ >	Accept settings and return to the *DTMF parameter* submenu
<ABORT>	Return to the *DTMF parameter* submenu without making the changes

Restore the defaults:

The following defaults can be restored at any time:

- Level = 0 dB
- Time = 80 ms
- Interval = 80 ms

```
DTMF parameter
→Defaults
---------------↓
  ⬑      ↓     ✓
```

```
DTMF parameter
Reset to
default values
CONT.
```
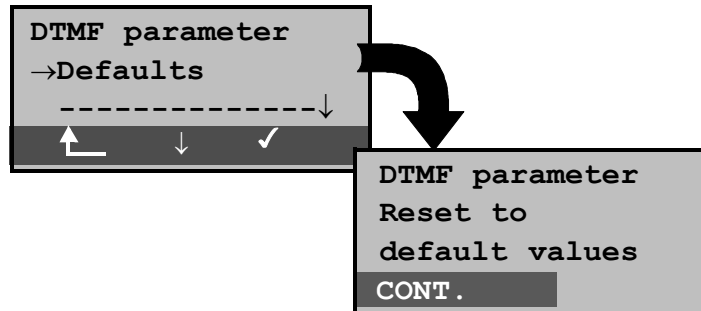
	Operation
< ↓ >	Select the *Defaults* function
< ✓ >	Confirm your selection
⬑	Return to the *Analog config.* menu
<Continue >	Reset to default settings and return to the *DTMF parameter* menu

6.9.4.6 FLASH time

With this selection, you can set the length of a flash in analog operation. The FLASH time can take a value between 40ms and 1s. It can be raised or lowered using the arrow keys as follows:

In the range   40...200ms   in 10ms increments
In the range   200...300ms   in 20ms increments
In the range   300...1000ms   in 100ms increments

When the upper limit is reached (1000ms), the softkey < ↑ > will automatically change to a < ↓ > and vice versa when the lower limit (40ms) is reached.

```
Analog config.
→FLASH time
 ---------------↓
   ↰      ↓      ✓
```

```
FLASH time
  40 ms

ABORT    ↑        ✓
```
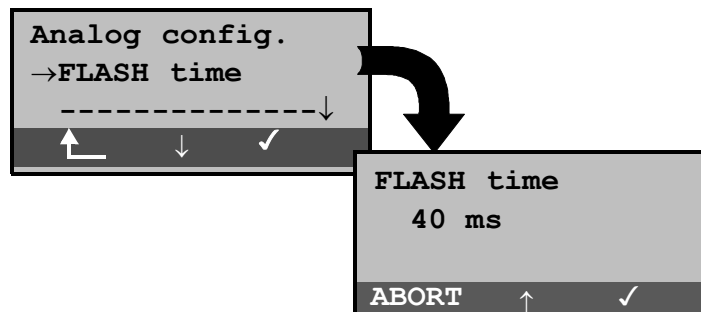
	Operation
< ↓ >	Select *FLASH time* function
< ✓ >	Confirm your selection
↰	Return to the *Configuration* menu
↓ -Key	Reduce FLASH time
< ↑ > or ↑-Key	Increase FLASH time
< ✓ >	Confirm the entry and continue to the *Analog config.* menu.
<ABORT>	Return to the *Analog config.* menu without changing the selected setting.

6.9.5 Configuration: ARGUS

```
Configuration
→ARGUS
  Numbers    ↓
    ↑__     ↓     ✓
```
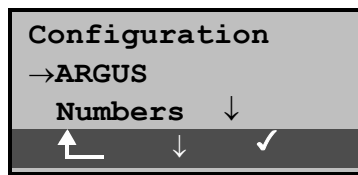
Operation

< ↓ >   Select the *ARGUS* submenu

< ✓ >   Open the *ARGUS* submenu

↑__   Return to the Main menu

6.9.5.1 Selecting the menu language

```
ARGUS config.
→Menu language
  LCD contrast   ↓
    ↑__     ↓     ✓
```

```
Menu language
→German
  English
ABORT    ↓     ✓
```
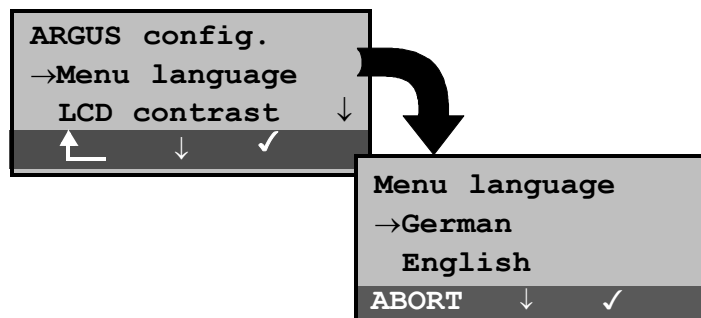
Operation

< ↓ >   Select the *Menu language* function

< ✓ >   Open the *Menu language* function

↑__   Return to the *Configuration* menu

< ↓ >   Select the desired language

< ✓ >   Confirm the selection and return to the *ARGUS config.* menu.

<ABORT >   Return to the *ARGUS config.* menu without changing the setting.

6.9.5.2 Setting the display contrast

The contrast of the ARGUS display can be adjusted to suit the individual user. The contrast can be adjusted in 16 steps.
In the third line, the display shows a vertical arrow, which shows the current setting on a scale from low to high contrast.

```
ARGUS config.
→LCD contrast
  Date / time   ↓
  ↰        ↓     ✓
```

```
LCD contrast
low-----high
       ↑
ABORT         ✓
```
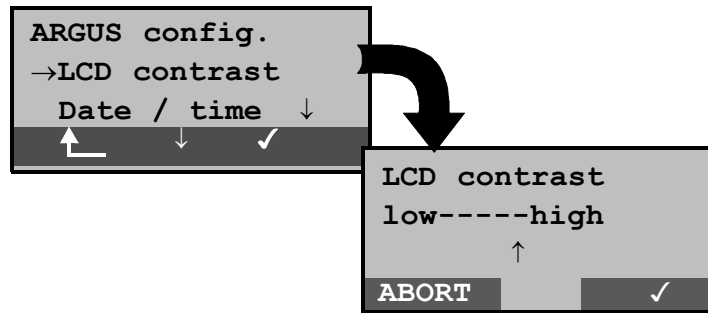
	Operation
< ↓ >	Select the *LCD contrast* function
< ✓ >	Open the *LCD contrast* function
↰	Return to the *Configuration* menu
↓ -Key	Decrease contrast
↑ -Key	Increase contrast
< ✓ >	Change the LCD contrast and return to the *ARGUS config.* menu.
<ABORT >	Return to the *ARGUS config.* menu. without changing the setting.

6.9.5.3 Date / Time

Any date and time can be entered. The ARGUS will use these settings on the D-channel in the NT mode of operation and in the **automatic test**.

```
ARGUS config.
→Date / time
  Handset        ↓
    ↰      ↓     ✓
```

```
Enter date / time
Date: 24.4.01
Time:  16:30
ABORT   DEL    ✓
```
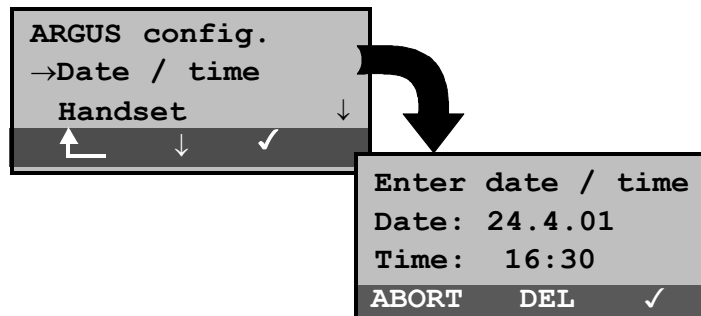
	Operation
< ↓ >	Select the *Date / time* function
< ✓ >	Open the *Date / time* function
↰	Return to the *Configuration* menu
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑧ ⓪ ⑧	Enter the desired date
↓ -Key	Switch to the Time line
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑧ ⓪ ⑧	Enter the desired time
<DEL>	Delete the digit before the cursor
< ✓ >	Confirm the entries and return to the *ARGUS config.* menu.
<ABORT>	Return to the *ARGUS config.* menu. without changing the setting.

The entered date will be saved in the ARGUS and will be suggested as the default the next time that the *Enter date/ time* function is used.

The entered time will be continuously updated by the ARGUS's real time clock as long as the power is not switched off.

When the power is switched off (the ARGUS switched off without batteries), the clock will run a few more weeks on its internal supply. When the backup supply is exhausted, the

time will be undefined.

6.9.5.4 Handset

The ARGUS makes a distinction between the integrated handset and an external headset:

```
ARGUS config.
→Handset
  Alarm bell      ↓
  ↑       ↓       ✓
```

```
Handset
→Internal
  Extern/Headset
ABORT    ↓      ✓
```
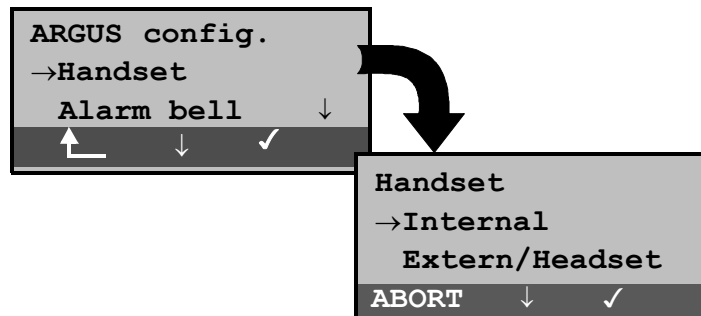
	Operation
< ↓ >	Select the *Handset* function
< ✓ >	Open the *Handset* function
↑	Return to the *Configuration* menu
< ↓ >	Select the desired handset
< ✓ >	Confirm the setting and return to the *ARGUS config.* menu
<ABORT >	Return to the *ARGUS config.* menu. without changing the setting.

With the softkey, an existing connection can be switched back and forth between an external headset and the integrated handset (see "Setting up an ISDN connection" on page 53).

6.9.5.5 Printer

This function is used to set the printer options. The default is
EPSON LQ.

```
┌─────────────────────────┐
│ ARGUS config.           │
│ →Printer                │
│   Alarm bell        ↓   │
│  ▲_        ↓       ✓   │
└─────────────────────────┘
            ┌──────────────────────────┐
            │ Printer                  │
            │ →HP-Printer              │
            │   EPSON-LQ-Mode      ↓   │
            │ ABORT      ↓       ✓   │
            └──────────────────────────┘
```
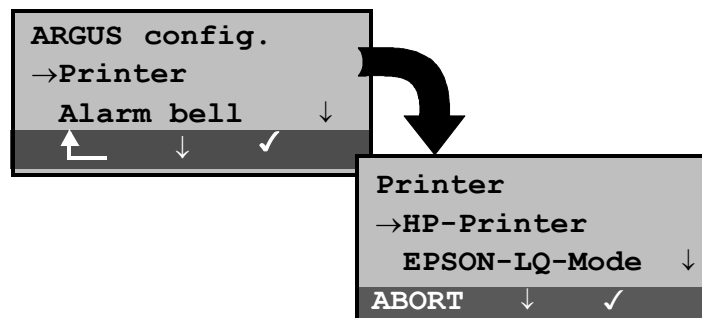
	Operation
< ↓ >	Select the *Printer* function
< ✓ >	Open the *Printer* function
▲_	Return to the *Configuration* menu
< ↓ >	Select desired printer
< ✓ >	Confirm the setting and return to the *ARGUS config.* menu
<ABORT >	Return to the *ARGUS config.* menu. without changing the setting.

If you wish to use a printer that is not compatible with either
the HP-Printer or the EPSON LQ, select the *ESC sequence.*

An entry mask will open in which you can enter an ESC-
sequence character-by-character, which will permit the
optimum adaptation to your printer.

Up to 9 different ESC sequences can be entered and saved
in the EEPROM in the ARGUS so that these will still be
available after the ARGUS has been switched off and then
back on.

```
ESC sequence 1
Enter:
#14#78#89#128
EXIT   DEL      ✓
```

Operation

< DEL >   Delete the digit before the cursor

🔘 🔘 🔘   Enter the ESC sequence (see the information
🔘 🔘 🔘   from the manufacturer of your printer) in
🔘 🔘 🔘   decimal format. The character codes are
🔘 🔘 🔘   each separated by a "#".

< ✓ >   Save the entered ESC sequence in
              EEPROM. The display is setup for the entry
              of the next ESC sequence.

<EXIT>   Return to the *ARGUS config. menu*

6.9.5.6 Alarm bell

The ARGUS signals with an alarm in a variety of situations, e.g. when a bit error occurs in a BERT. With the *Alarm bell* function, you can suppress all audible alarms.

```
ARGUS config.
→Alarm bell
 -------------- ↓
   ↰      ↓      ✓
```

```
Alarm bell
→On
  Off              ↓
ABORT    ↓      ✓
```
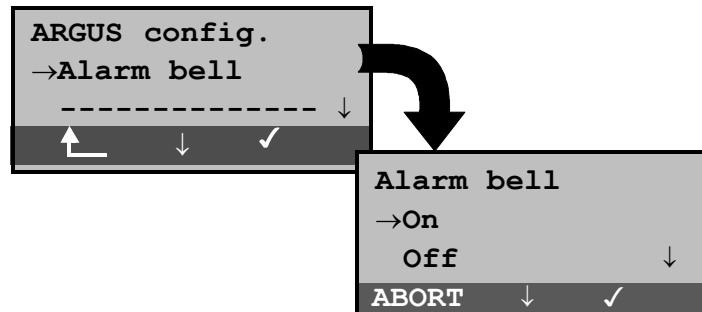
	Operation
< ↓ >	Select the *Alarm bell* function
< ✓ >	Open the *Alarm bell* function
↰	Return to the Configuration menu
< ↓ >	Select the desired setting
< ✓ >	Confirm the setting and return to the *ARGUS config.* menu
<ABORT>	Return to the *ARGUS config.* menu. without changing the setting.

This setting is not lost when the ARGUS is switched off and back on again.

6.9.5.7 Baud rate

There is a selection of baud rates available for use when
connecting the ARGUS to a PC.
The default setting is 57600 baud.

```
ARGUS config.
→Baud rate
  Handset          ↓
  ↰        ↓        ✓
```

```
Baud rate
→max 57600
  max 38400         ↓
ABORT    ↓        ✓
```

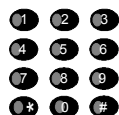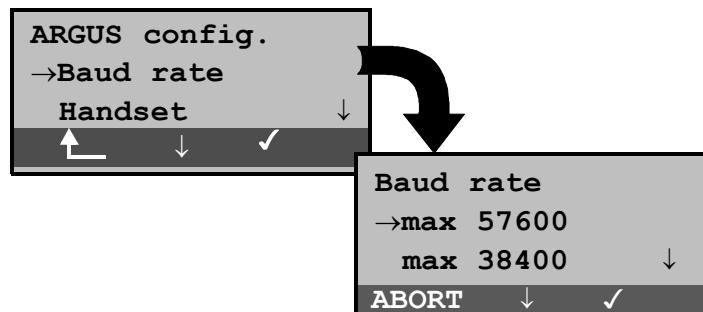|	**Operation**
< ↓ >	Select the *Baud rate* function
< ✓ >	Open the *Baud rate* function
↰	Return to the Configuration menu
< ↓ >	Select the desired setting
< ✓ >	Confirm the setting and return to the *ARGUS config.* menu
<ABORT >	Return to the *ARGUS config.* menu. without changing the setting.

6.9.5.8 PC Access

The data can be transferred between the ARGUS and a PC via the serial interface or cordlessly via the IrDa infrared interface.
.

```
ARGUS config.
→PC access
  Numbers  ↓
  ↰      ↓      ✓
```

```
PC access
→Serial
  IrDa              ↓
  ABORT     ↓       ✓
```
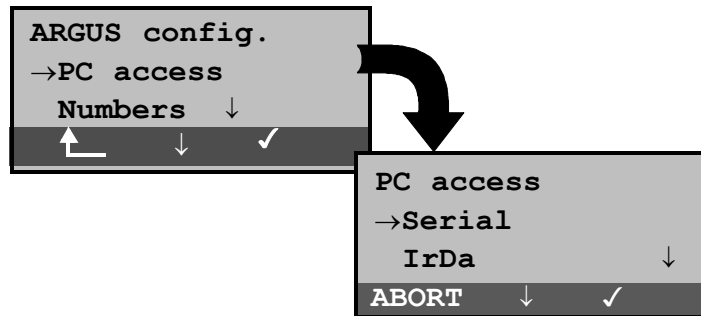
	Operation
< ↓ >	Select the *PC access* function
< ✓ >	Open the *PC access* function
↰	Return to the Configuration menu
< ↓ >	Select desired access
< ✓ >	Confirm the setting and return to the *ARGUS config.* menu
<ABORT >	Return to the *ARGUS config.* menu. without changing the access setting.

⚠ A software update of the ARGUS can only be made over the serial interface.

6.9.6 Saving Call Numbers

Ten call numbers with a maximum of 24-places can be entered in the speed-dialing memory.

⚠ The first number **must** be the **own** call number of the access under test (this is especially important for the automatic Service test).

In the *Remote No.1-8* memory locations, you can save whichever remote call numbers you wish. In the memory location *X.31 test number* , the ARGUS expects the entry of the X.25 access number for the X.31 test (see Chap. 6.6.6 page 95).

```
Configuration
→Numbers
  Reset      ↓
   ↰      ↓      ✓
```

```
Enter numbers
Own number
↓
8^6790
    ↰
```
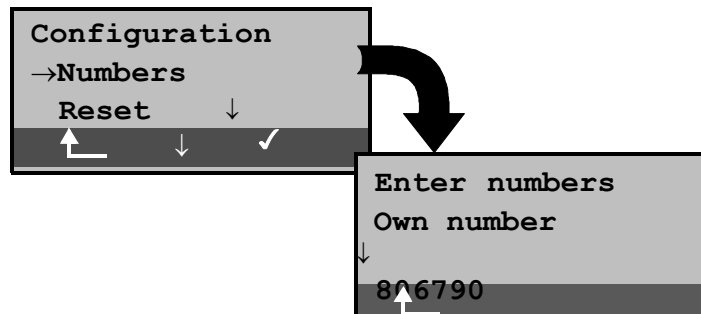
	Operation
< ↓ >	Select the *Enter numbers* function
< ✓ >	Open the *Enter numbers* function
↰	Return to the Main menu
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑅ ⓪ ⌗	Enter the desired number **The first number must be the own call number of the access under test.**
↓ -Key	Scroll to the next speed-dialing memory and enter the next number
< ✓ >	Save call numbers. The display is setup for the entry of the next call number.
< DEL >	Delete the digit before the cursor
↰	Return to the *Configuration* menu

When entering a call number with an extension (operation of the ARGUS on a PBX access) observe the following:
The extension is separated from the access number by a #.

For outgoing calls, the ARGUS uses the entire call number (without #) as the number called (CDPN or DAD) and, for the calling number (DSS1-CGPN or 1TR6-OAD), only the number after the #, in other words the extension. A "#" at the beginning of a call number is treated as a valid character.

An example:
02351/9970-45 is entered as 023519970#45

⚠ If the "# " is at the end of a number, when the number is later dialed it will be done without CGPN or OAD. This is important for some PBXs.

6.9.7 Reset

The ARGUS resets all of the settings or entries made in the *Configuration* menu back to their default values.

⚠️ The speed-dialing memory and the results of all of the automatic tests will be deleted.

The following settings are possible:

	Default	
BERT time	1 min	
BERT error level	10^{-06}	
BERT bit pattern	10^{15}-1	
BERT-HRX	15%	
Bit pattern "freely-defined"	0000000000000000	
Alerting mode	Automatic	
Call acceptance	All MSNs	
L1 permanent?	No	only for BRI NT
Clock mode	For NT, *Master* For TE, *Slave*	
Analog dialing mode	DTMF	
Analog CLIP	FSK	
Analog AOC pulse	16 kHz	
Analog FLASH time	80 msec	
DTMF parameter	80ms/80ms/0dB	
Menu language	Depends on country (national variant)	
LCD contrast	Average value	
Date	1.1.2000 / 12:00	
Headset	Internal	
Printer	EPSON LQ	
ESC sequence (Printer)	none	

```
Configuration
→Reset
--------------  ↓
  ↰        ↓      ✓
```

```
Reset
all parameters
?
ABORT            YES
```
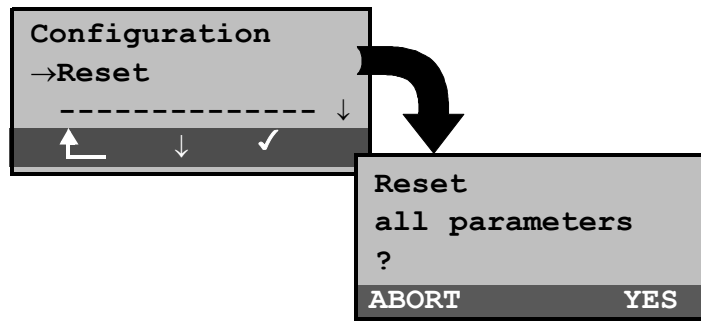
	Operation
< ↓ >	Select the *Reset* function
< ✓ >	Open the *Reset* function
↰	Return to the Main menu
< YES **>**	After prompting you to confirm that you are sure, the ARGUS will reset all of its settings.
<ABORT >	Return to the *Configuration* submenu without resetting the parameters.

6.10 Menu: Level Measuring

```
ARGUS10 BRI
→Level measuring
  L1 status      ↓
     ┗      ↓    ✓
```
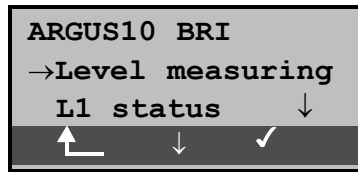
	Operation
< ↓ >	Select the *Level measuring* menu
< ✓ >	Open the *Level measuring* menu
┗	Return to the status display

6.10.1 Level measuring on a BRI access

- **Level measurement – connected line**

The ARGUS measures the level of the received useful signal . In TE mode, it also measures the phantom feed. The measurement will be updated continuously.

```
Level Measuring
→Connected line
  Other TE       ↓
     ┗      ↓    ✓
```

```
Level:     0.64V OK
Voltage:
38.2V        OK NORM
MENU    RON      NEW
```
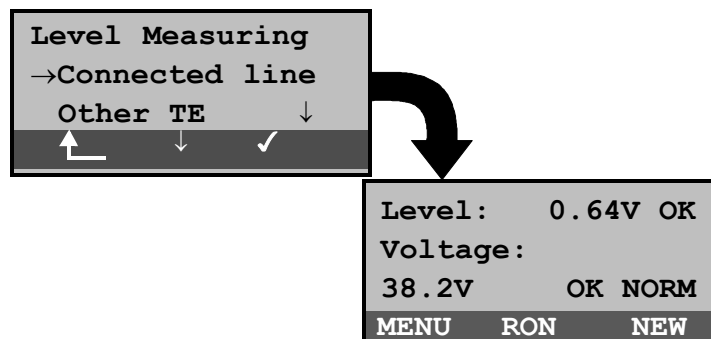
	Operation
< ↓ >	Select the *Connected line* (remote end)
< ✓ >	Start the *Connected line* function
┗	Return to the Main menu
< NEW >	Layer 1 will setup again to ensure a proper measurement on a Layer 1 that is not permanently active
< MENU >	Return to the *Level measuring* menu

`<RON>` or	Add or remove a **100Ω** resistor.
`<ROFF>`	

Measurement results:

First line: The level of the useful signal in volts. An evaluation of the level follows:

<< level is too low

>> level is too high

OK The level will be evaluated as OK by ´by the ARGUS, as long as it remains in the range $0.75V^{+20\%}_{-33\%}$.

__ No level

Third line: The level of the feed in volts. An evaluation of the level follows.

Afterwards, the type of supply will be displayed:

NORM The feed will be evaluated by the ARGUS as normal, as long as it is within the tolerance range of $40V^{+4.25\%}_{-13.75\%}$.

REV_ inverted phantom feed

NONE no feed

- **Level measurement - other TE**

In TE mode, the ARGUS will measure the level of a terminal connected in parallel. In this case, the ARGUS is **passive**.

Layer 1 must be active on the terminal, whose level will be measured. The ARGUS updates its measurement continuously.

```
Level Measuring
→Other TE
 ---------------↓
  ⬑      ↓      ✓
```

```
Level:    0.86V OK


MENU
```
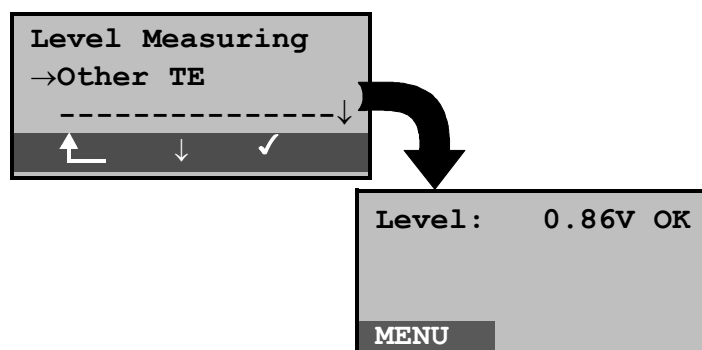
	Operation
< ↓ >	Select *Other TE*
< ✓ >	Confirm your selection
↰	Return to the Main menu
< MENU >	Return to the *Level measuring* menu

Measurement results: The level of the useful signal in volts.

⚠ This measurement is only possible when the ARGUS is **not** supplied by the BRI.

6.10.2 Level measurement on a U interface

• Measurement of feed voltage - U interface

The ARGUS measures the level of the feed voltage. The measurement will be updated continuously.

```
Level Measuring
→Voltage U
  Power U
   ↰        ↓        ✓
```

```
Voltage U
U: 93V

MENU
```
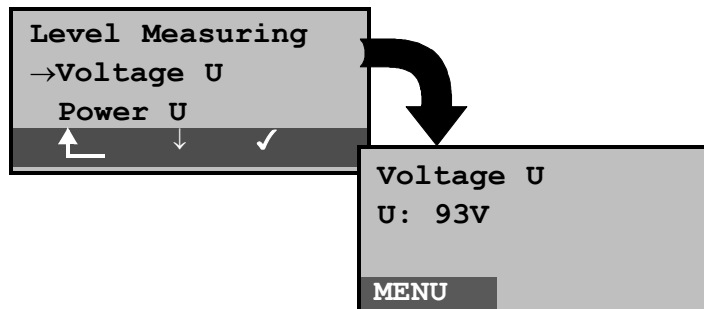
	Operation
< ↓ >	Select *Voltage U*
< ✓ >	Start measurement
↰	Return to the Main menu
< MENU >	Return to the *Level measuring* menu

Measurement results: The level of the supply in volts.

- **Measurement of the U_{k0} under load**

With this function, you can use the ARGUS to apply an incremental load to the U interface.

The ARGUS measures the voltage and also displays the calculated current and power.

From these values, it is possible to estimate the length of the line.

```
Level Measuring
→Power U
---------------↓
   ↰      ↓      ✓
```

```
Power U
R: 9.20kΩ  U: 85V
P: 761mW  I:9.1mA
ABORT    –      +
```
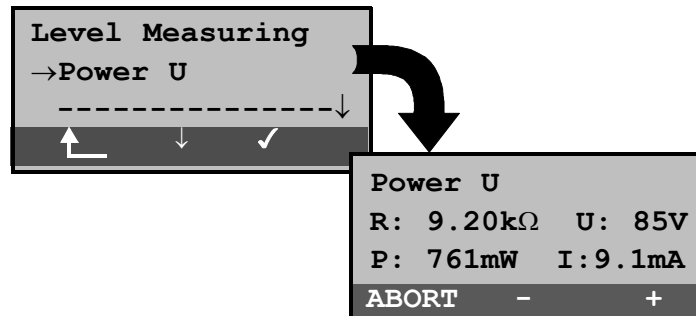
	Operation
< ↓ >	Select *Power U*
< ✓ >	Start measurement
↰	Return to the Main menu
< + >	The load will be increased by one increment (the resistance is lowered)
< – >	The load will be lowered by one increment (the resistance is increased)
<ABORT>	Return to the *Level measuring* menu

Measurement results:

2. line: The load in $k\Omega$ and the measured voltage (should not be > 100V).

3. line: The calculated power in mW plus the calculated current in mA.

Step	Load / kΩ	Maximum Voltage / V
1	64	ca. 126.0 [1]
2	28	ca. 126.0 [1]
3	19	ca. 114.0 [1]
4	14	ca. 114.0 [1]
5	11	ca. 114.0 [1]
6	9	ca. 109.4 [2]
7	8	ca. 101.8 [2]
8	7	ca. 94.6 [2]
9	6	ca. 75.0 [1]
10	5,5	ca. 75.0 [1]
11	5	ca. 75.0 [1]
12	4,5	ca. 75.0 [1]
13	4,2	ca. 73.9 [2]
14	3,9	ca. 71.2 [2]
15	2,7	ca. 59.5 [2]

[1] The voltage is limited by the power capacity of the individual components in the ARGUS

[2] The voltage is limited by the maximum power (1300mW)

When switching the load levels, the power limitations of the components within the ARGUS and the maximum permissible power (1300mW) of the U-interface must be taken into consideration. Therefore, the ARGUS will only permit the load to be switched another increment when the specified voltage will not be exceeded.

6.10.3 Level measuring on an analog access

The ARGUS measures the voltage level in both the normal case and when the line is "busy" (trunk line). ´

```
Level Measuring
→Connected line
----------------
  ↰       ↓       ✓
```

```
 Polarity:       a+
b-
 ab normal     30.4V
 ab busy       13.6V
```
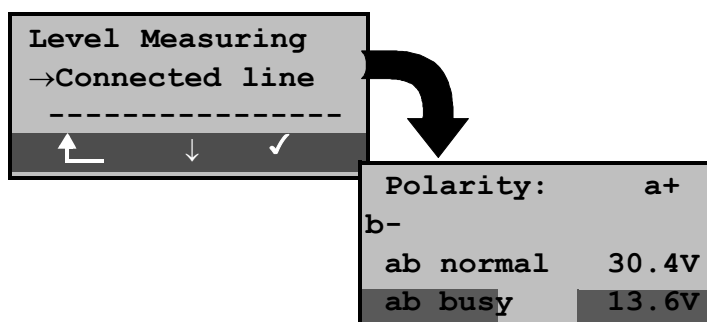
	Operation
< ↓ >	Select the *Connected line* (remote end)
< ✓ >	Start measurement
↰	Return to the Main menu
<NEW>	The measurement will be repeated.
<ABORT>	Return to the *Level measuring* menu

Measurement results:

First line:	The polarity of the analog line (2 wire)
	Red plug: a
	Black plug: b
Second line:	The normal voltage level
Third line:	The voltage level when the line is "busy"

6.11 Menu: L1 Status

This menu includes the following functions:
- To display the Layer 1 status when the ARGUS is operated on a BRI access

6.11.1 The L1 status of a BRI access

The ARGUS displays in TE mode the current status of Layer 1: which signal is received from the remote end (Rx) and which signal the ARGUS sends (Tx).

```
ARGUS10 BRI
→L1 status
 Configuration ↓
  ↰      ↓      ✓
```

```
L1 status
Rx: Info 4
Tx: Info 3
ABORT          NEW
```
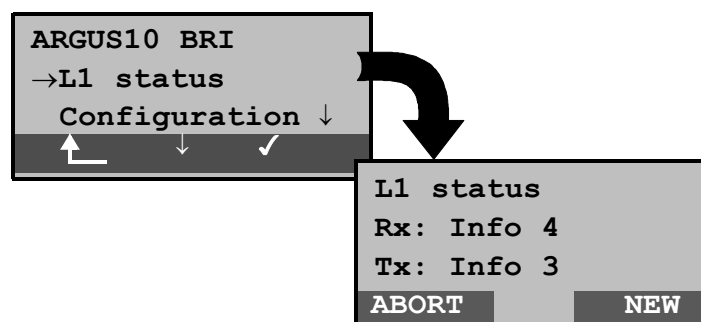
	Operation
< ↓ >	Select the *L1 status* menu
< ✓ >	Open the *L1 status* menu
↰	Return to the status display
< NEW >	Layer 1 will be setup, if it is not already
<ABORT >	Return to the Main menu

The ARGUS displays the status of Layer 1 or of the signal, which is being sent (Info 0 .... Info 4).

6.12 Testing Features with the Keypad

This feature is only relevant for a BRI access!
Some network operators do not support the standard DSS1 features, rather they expect the user to control the network via so-called keypad command sequences.

In these cases, the desired facility is usually activated by entering a series of characters and then sending these characters within a DSS1-specific protocol element. These so-called Keypad-Elements are imbedded in a SETUP message.

An outgoing call containing a keypad message is placed from the ARGUS by pressing the ✆ -Key.

To distinguish the call from a normal call, the first character sent is the '#'. Each step is acknowledged either acoustically (handset) or via special protocol elements (cause). These causes are displayed by the ARGUS.

To simplify the use of these functions, you can use the ARGUS's speed-dialing memory.

An example for an application:

Speed-dial number 0	4711	own number of the access under test
Speed-dial number 1	124527	tel. no. of own company
Speed-dial number 2	#*67#	Code for activating CFB
Speed-dial number 3	##67#	Code for deactivating CFB
Speed-dial number 4	#*#67#	Code for querying CFB (interrogation)
Speed-dial number 5	#*#21#	Code for querying CFU (interrogation)
Speed-dial number 6	#*#61#	Code for querying CFNR(interrogation)
Speed-dial number 7		*free*
Speed-dial number 8		*free*
Speed-dial number 9		*free*

7 Appendix

A) Acronyms

3PTY	Three party service / Three party conference
AI	Action Indicator
AOC	Advice of Charge
AOC-D	Advice of Charge Charging information during the call and at the end of the call
AOC-E	Advice of Charge Charging information at the end of the call
AWS	Call Forwarding (Anrufweiterschaltung)
BC	Bearer Capability
BER	Basic Encoding Rules / Bit Error Rate
BERT	Bit Error Rate Test
CALL PROC	CALL PROCeeding message
CCBS	Completion of Calls to Busy Subscriber
CCNR	Call Complete No Response Automatic Callback if the called party did not answer
CD	Call Deflection
CDPN	CalleD Party Number
CF	Call Forwarding
CFB	Call Forwarding Busy Forward calls when busy
CFNR	Call Forwarding No Reply Forward calls when no answer
CFU	Call Forwarding Unconditional Forward all calls
CGPN	CallinG Party Number
CLIP	Calling Line Identification Presentation Display caller's number
CLIR	Calling Line Identification Restriction Suppress display of the caller's number
COLP	Connected Line Identification Presentation Display the number of the party called
COLR	Connected Line Identification Restriction Suppress the display of the number of the party with whom one is connected
CONN	CONNect Message

CONN ACK	CONNect ACKnowledge Message
CR	Call Reference
CT	Call Transfer
CUG	Closed User Group
CW	Call Waiting Call waiting
DAD	Destination Address (1TR6)
DDI	Direct Dialling In Direct dialling in to an extension on a PBX
DISC	DISConnect Message
DM	Supplementary services (Dienstmerkmal)
DTMF	Dual Tone Multi Frequency
EAZ	Terminal Ident. No. (Endgeräteauswahlziffer - 1TR6)
ECT	Explicit Call Transfer Call transfer or directed call forwarding
E-DSS1	European Digital Subscriber Signalling System Number 1
GBG	Closed user group (CUG) (Geschlossene Benutzer Gruppe)
HLC	High Layer Compatibility
HOLD	Call Hold Hold
ISDN	Integrated Services Digital Network
INFO	INFOrmation Message
LAPD	Link Access Procedure for D-channels channels
LCN	Logical channel number Channel number in X.25
LLC	Low Layer Compatibility
MCID	Malicious Call Identification
MSN	Multiple Subscriber Number
NSF	Network Specific Facilities
NT	Network Termination
OAD	Origination Address (1TR6)
PD	Protocol Discriminator
REL	RELease Message
REL ACK	RELease ACKnowledge Message
REL COMPL	RELease COMPLete Message
SCI	Sending Complete Indication
SIN	Service Indicator (1TR6)
SUB	Sub-addressing / Sub-addressing is possible

SUSP	SUSPend Message
TE	TErminal, Terminal Equipment
TEI	Terminal Endpoint Identifier
TP	Terminal Portability
	Moving the terminal on the bus
UUS	User-to-User Signalling
	Transfer of user data

B) CAUSE-Messages – DSS1 Protocol

Dec.	Cause	Description
01	Unallocated (unassigned) number	No access under this call number
02	No route to specified transit network	Transit network not reachable
03	No route to destination	Wrong route or routing error
06	Channel unacceptable	B-channel for the sending system not acceptable
07	Call awarded and being delivered in an established channel	Call awarded and connected in an already existing channel (e.g., X.25 SVC)
16	Normal call clearing	Normal disconnect
17	User busy	The number called is busy
18	No user responding	No terminal equipment answered (Timer NT303 / NT310 time-out)
19	No answer from user (user alerted)	Call time too long
21	Call rejected	Call rejected (active)
22	Number changed	Call number has been changed
26	Non-selected user clearing	Incoming call not awarded to this terminal
27	Destination out of order	Destination / access out of order
28	Invalid number format (address incomplete)	Wrong call number format or call number incomplete
29	Facility rejected	The facility is not offered
30	Response to STATUS ENQUIRY	Response to status enquiry
31	Normal, unspecified	Unspecified for "normal class" (Dummy)
34	No circuit / channel available	No circuit / B-channel available
38	Network out of order	Network not operational
41	Temporary failure	Network is temporarily not operational
42	Switching equipment congestion	Switching equipment is overloaded
43	Access information discarded	Access information could not be transferred
44	Requested circuit / channel not available	Requested circuit / B-channel is not available
47	Resources unavailable, unspecified	Unspecified for "resource unavailable class" (Dummy)
49	Quality of service unavailable	The requested quality of service is not available
50	Requested facility not subscribed	Requested service attribute is not subscribed
57	Bearer capability not authorized	The requested bearer capability is not enabled
58	Bearer capability not presently available	The requested bearer capability is not currently available

63	Service or option not available	"Service unspecified or option not available class" (Dummy)
65	Bearer capability not implemented	Bearer capability is not supported
66	Channel type not implemented	Channel type is not supported
69	Requested facility not implemented	Requested facility is not supported
70	Only restricted digital information bearer capability is available	Only limited bearer capability is available
79	Service or option not implemented, service unspecified or option not implemented class" (Dummy)	Unspecified
81	Invalid call reference value	Invalid call reference value
82	Identified Channel does not exist	Requested channel is invalid
83	A suspended call exists, but this call identity does not	The call identity entered is the wrong one for the parked call
84	Call identity in use	The call identity is already in use
85	No call suspended	No call has been parked
86	Call having the requested call identity has been cleared	The parked call has been cleared
88	Incompatible destination	Incompatible destination
91	Invalid transit network selection	Invalid format for the transit network identifier
95	Invalid message, unspecified	Unspecified for "Invalid message class" (Dummy)
96	Mandatory information element is missing	Mandatory information element is missing
97	Message type non-existent or not implemented	This type of message is in this phase not permitted, not defined or not supported
98	Message not compatible with call state or message type non-existent or not implemented	The content of the message is in this phase not permitted, not defined or not supported
99	Information element non-existent or not implemented	The content of the information element is in this phase not permitted, not defined or not supported
100	Invalid information element contents	Invalid content in information element
101	Message not compatible with call state	Message not valid in this phase
102	Recovery on timer expired	Error handling routine started due to time-out
111	Protocol error, unspecified	Unspecified for "protocol error class" (Dummy)
127	Interworking, unspecified	Unspecified for "interworking class" (Dummy)

C) CAUSE-Messages – 1TR6 Protocol

Dec.	Cause	Description
01	Invalid call reference value	Invalid call reference value
03	Bearer service not implemented	The service is not available in the central office or at another location in the network or the service has not been subscribed.
07	Call identity does not exist	Unknown call identity
08	Call identity in use	Call identity is already assigned to a "suspended" connection.
10	No channel available	No further B-channel is free on the subscriber's access. (only significant locally)
16	Requested facility not implemented	The entered FAC-Code is unknown in this network.
17	Requested facility not subscribed	The requested facility is not available, because the initiating or the remote subscriber is not authorized.
32	Outgoing calls barred	Outgoing calls are not possible due to the barring
33	User access busy	If the sum of the number of free B-channels, the number of occupied B-channels, the number of awarded B-channels and the number of calls without B-channel assignment equals four, new incoming calls will be cleared from the network. The calling subscriber receives a DISC with the cause "user access busy"(= first busy) and a busy signal.
34	Negative CUG comparison	Connection not possible due to negative CUG comparison
35	Non-existent CUG	This CUG (GBG) does not exist
37	Communication link as SPV not permitted	A connection is not possible, since for example, the RFNR-test was negative
53	Destination not obtainable	A connection cannot be made due to a wrong destination, service or supplementary services.
56	Number changed	Subscriber-B's call number has changed.
57	Out of order	The remote terminal is not ready.
58	No user responding	No terminal has answered the incoming SETUP or the subscriber call was disconnected, it is assumed that someone is present (Time-out for ringing T3AA).
59	User busy	Subscriber-B is busy
61	Incoming calls barred	Subscriber-B has blocked incoming calls or the requested service is not supported by Subscriber-B.

62	Call rejected	**To Subscriber-A:** The requested connection is actively rejected by Subscriber-B (by sending a DISC as answer to the incoming SETUP). Another terminal is in the setup phase with the incoming call: The call has already been accepted by another terminal on the bus.
89	Network congestion	Network congested, e.g., switching equipment congestion, no conference set free, ...
90	Remote user initiated	Rejected or disconnected by remote end (subscriber or exchange).
112	Local procedure error	**Sent in a REL** Disconnect due to local errors (e.g., not valid messages or parameters, time-out, ...). **Sent in a SUSP REJ** Due to another already active supplementary service, the connection may not be "suspended". **Sent in a RES REJ** There is no "suspended" connection. **Sent in a FAC REJ** No further supplementary service request is possible, since there is still one being processed or the supplementary service requested is not available in the current state of the connection.
113	Remote procedure error	Caused by error at remote end.
114	Remote user suspended	Connection at the remote end is in the "hold" or "suspend" state.
115	Remote user resumed	Connection at the remote end is no longer in the "hold" or "suspend" or "conference" state.
127	User Info discarded locally	The message USER INFO is rejected locally. The cause is given in the message CON CON. Length entry (=0) Normal disconnect (e.g., in REL as answer to a DISC from subscriber or a change of service in a DISC): Command to the terminal to release the B-channel.

D) ARGUS Error Messages

Error Number	Error Class	Cause.	Description
0	E	Network	The network is not in a state defined for DSS1 or 1TR6. It may be that this state is normal for a PBX.
1 to 127	B,C,D,E	Network	DSS1 or 1TR6 causes
150	E	ARGUS	An error occurred during the supplementary service test. Frequent cause: no response from network
152	B	ARGUS	The CF-Test was started with the wrong own number. .
153	E	ARGUS	no HOLD is available, but HOLD is required to test the supplementary service (ECT, 3pty)
154	E	ARGUS	CLIR or COLR could not be tested, since CLIP or COLP is not available
161	B	ARGUS	The party called did not answer within the prescribed time (approx.10 sec)
162	B	ARGUS	A call was setup to a remote subscriber, instead of being setup – as was expected – to your own number.
163	E	ARGUS	The Auto-Test could not setup a connection and therefore the AOC/D supplementary service could not be tested.
199	B	ARGUS	A call number was entered.
201	A	ARGUS	Network did not confirm acceptance of the call (CONN sent, no CONN_ACK received from network)
204	A	ARGUS	- Layer 2 connection was cleared-down - No response to SETUP (call setup) - Layer 2 connection could not be setup
205	A	ARGUS	Reestablish the Layer 2 Connection

210	A	ARGUS	No response to the clear-down (REL sent, no REL_CMP/REL_ACK received from network)
220	A	ARGUS	Remote end signaled that it is in State 0.
245	E	ARGUS	Keypad sent via ESC, but no response was received from network
250	E	ARGUS	FACility was sent, but no response was received from network

X.31 Test – Error messages

X.31 Causes

0 to 255	Network	See ISO 8208: 1987(E) Table 5- Coding of the clearing cause field in clear indication packets, page 35
257	ARGUS	no response from network (for a CALL-REQUEST or CLEAR-REQUEST)
258	ARGUS	Unexpected or wrong answer from network (no CALL-CONNECTED or CLEAR-INDICATION as response to a CALL-REQUEST)
259	ARGUS	The network has indicated in a DIAGNOSTIC message that the logical channel is invalid. Cause: No (=1) or a wrong LCN was set.
512	ARGUS	It was not possible to determine an internal or external cause. Cause: Layer 2 could not be setup or remote end does not support X.31
65535	ARGUS	X.31 Layer 3 test was not performed. The error can only occur in a test log.

X.31 Diagnostic (only for a cause less than 256)

| 0 to 255 | Network | See ISO 8208: 1987(E) Figure 14A page 121 Figure 14B page 123ff And/or CCITT Recommendation X.25, Annex E |

E) Package contents

Included in the package are:

- ARGUS including batteries
  ARGUS ISDN-Test Adapter
- BRI connecting cable
- 9V plug-in power supply
- Shock-absorbing PVC jacket
- Analog and U-Interface 100V cable
- User's Guide
- WINplus CD
- Serial cable Type P2
- Guarantee card & registration
- ARGUS carrying case