



Cerberus[®] NW8005 Data Line Test Set

Technical Manual

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About this document

Purpose

This operating manual is designed to help the user of the Cerberus® NW8005 Data Line Test Set. It is restricted to the automatic measurement of data lines for Cerberus networks. A full description of functions can be found in the Line Test Set SLT-11/SLT-22 Operating Manual issued by ACTERNA (Wandel & Goltermann).

Scope

The assessment of cable quality for Cerberus data lines is only valid if the corresponding tolerance masks (Templates) from the Cerberus Division are used.

Brief description of the contents of the sections

Section	Overview of contents
Section 0 About this document	
Section 1 Device description	
Section 2 Structure and function	
Section 3 Installation / Commissioning	
Section 4 Functions and configuration	
Section 5 Operation	
Section 6 Components / Spare parts	
Section 7 Disposal / Protection of the environment	

Reference documents

Operating manual [1] SLT-11/SLT-22 Subscriber Line Tester	ACTERNA (Wandel & Goltermann)

Standard symbols

→	Result, Note
„ “	Quotation, reproduced identically
-> see	Cross-reference
(...)	Brackets contain supplementary text, suggestions, etc.

Document identification

Page	Meaning
Title page	- System names - Product type - Purpose of document
Last page	- Date of issue - Document-number - Supersedes:

Abbreviations

DU	Divisional Unit (subsidiary)
W&G	Wandel & Goltermann (ACTERNA)
OSS	Online Support System for downloading of software and documents

Modification index

Current version	Date
Issued 01	12.2000

1 Device description

1.1 Cerberus[®] NW8005 Data Line Test Set

Introduction

The Cerberus[®] NW8005 Data Line Test Set consists of the following components:

- Line Test Set WG SLK-12 from ACTERNA (Wandel & Goltermann) comprising
 - one each of line test devices SLT-11 and SLT-22
 - configuration and transfer software SLT
- Limit value templates for the automatic measurement of Cerberus data lines.

Application

The Cerberus[®] NW8005 Data Line Test Set is mainly used for the automatic measurement of Cerberus data lines. Line qualification is considerably simplified by a "Pass/Fail" assessment.

The device is used for testing in the following cases:

- unknown types of cable
- unknown (crucial) lengths of cable
- when taking over an existing cable installation
- for trouble-shooting communication problems with existing data lines

Other applications

Individual measurements can also be carried out. Furthermore, it offers a number of special functions which can be applied for trouble-shooting, for example, to locate / determine

- short circuits
- stub lines
- the junction of different types of cable
- cable lengths

Descriptions of these functions are not contained in this operating manual. They can be found in the operating manual issued by the manufacturers of the devices (SLK-12).

Technical data

→ See operating manual ACTERNA (W&G) section 10 Technical data

Standards

Compliance with CE is confirmed by W&G.

Software

The device is supplied by the manufacturer fully operative, complete with system software and for default has a number of tolerance masks (templates) for telecommunication lines.

Data lines for Cerberus networks require a specific tolerance mask curve for automatic measurement. The corresponding file must be requested from Cerberus or downloaded via OSS (<https://oss.cerberus.ch/swtool/systems/index.html#network>).

The SLT configuration and transfer software from ACTERNA (Wandel & Goltermann) operates on:

- Windows[™] 3.11
- Windows[™] 95/98
- Windows[™] NT

Software Updates

Software updates can be obtained from the manufacturer of the device direct, or via Internet. (<http://www.acterna.com>)

Qualifications required by personnel

The necessary software installations can be carried out by anyone who has solidly-based PC know-how and access to OSS. The automatic measurement for the Cerberus data lines does not need any PC or other special know-how. (Cable theory know-how is only needed for the *individual* measurements).

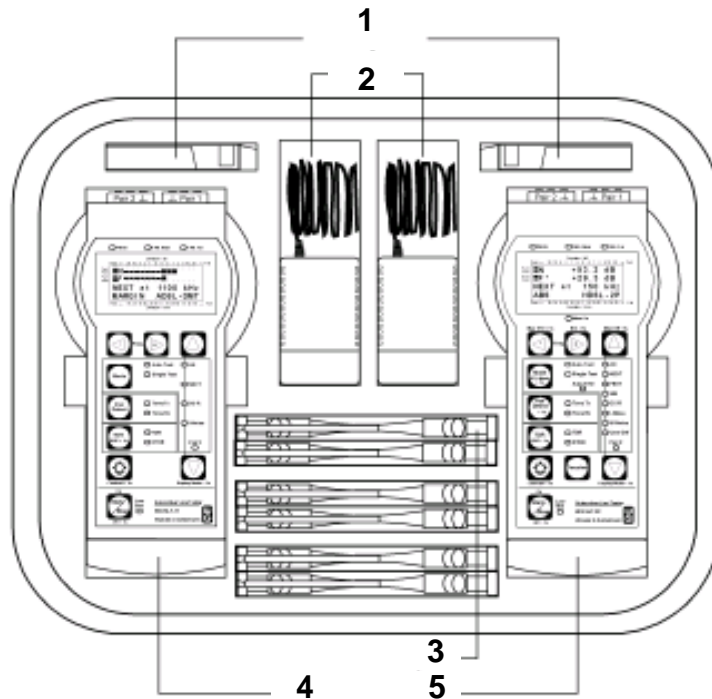
Note on safety



The Data Line Test Set is provided for measurements on communication lines which have not been switched on or have been switched off again.

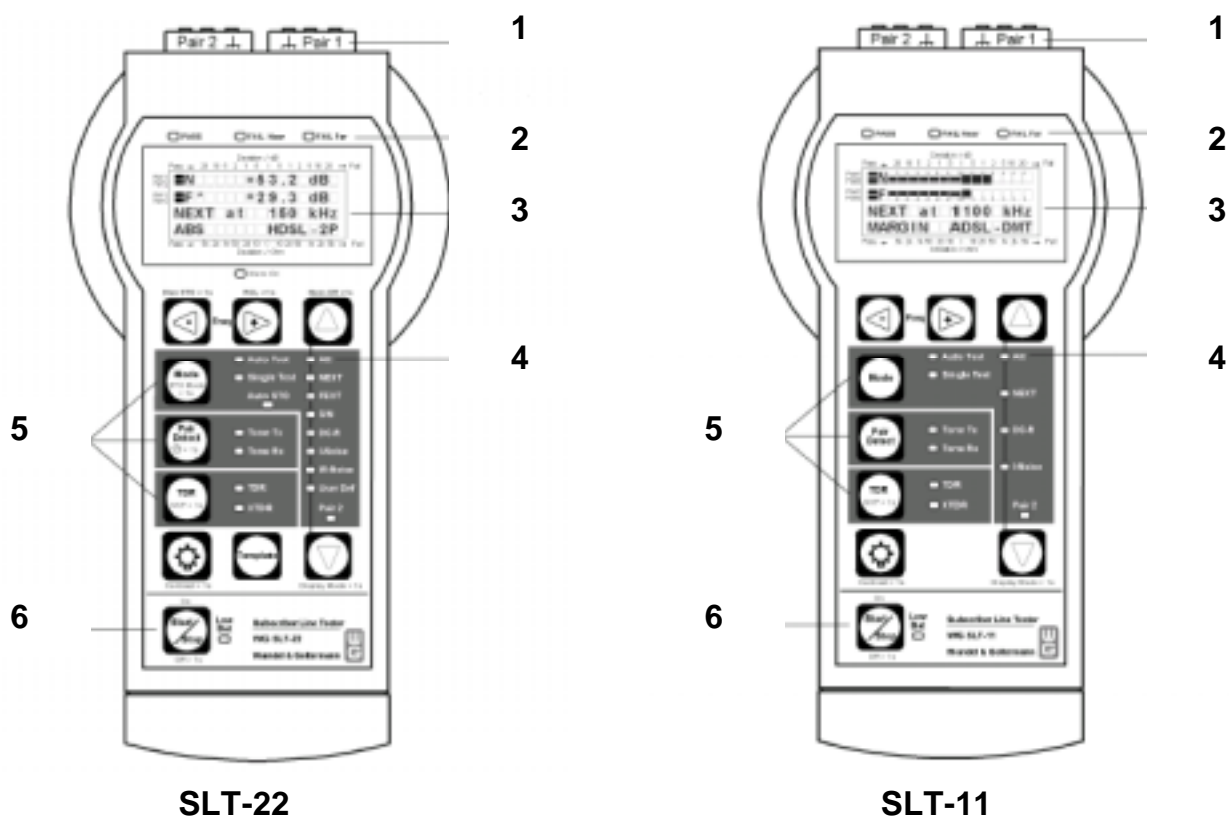
1.2 SLK-12 Line test set W&G

The Data Line Test Set consists of two devices: SLT-12 and SLT-22. They are packed together with the required measuring cable and other accessories in a carrying case.



- 1 Battery /battery cassettes
- 2 Power unit
- 3 Measuring cable
- 4 Line tester SLT-11
- 5 Line tester SLT-22

1.2.1 Front view SLT-22 and SLT-11



- 1 Test jacks for testing 1 or 2 wire pairs
- 2 Pass/Fail assessment for total measurement (PASS = Good; FAIL = Bad)
- 3 Display of measured results
- 4 Display of test function
- 5 Keys for operating mode
- 6 Start / Stop test

2 Structure and function

2.1 Device functions

The heart of the Data Line Test Set are the two line testers SLT-11 and SLT-22. They are used to measure all important line parameters and interference.

The line qualification of Cerberus data lines is carried out in the **Auto Test** operating mode as a measuring sequence. The device settings and measuring functions are pre-defined in special tolerance masks (templates).

The following measuring functions are contained in the Cerberus tolerance masks.

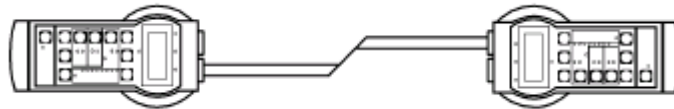
- Line attenuation (Att)
- Loop resistance (DC-R)
- Line Impedance (User Def); only SLT-22

Measurements can also be carried out individually in the **Single Test** operating mode. Further measurements are possible if a corresponding tolerance mask is created.

- Impulse noise (I-Noise)
- Far end crosstalk attenuation (FEXT); only SLT-22
- Signal-to-noise ratio (S/N); only-22
- Wideband noise (W-Noise); only-22
- Near-end crosstalk attenuation (NEXT)

2.2 Measuring set-up

A device is connected to each end of the line for a “Pass/Fail” assessment of the cable quality of Cerberus data lines.

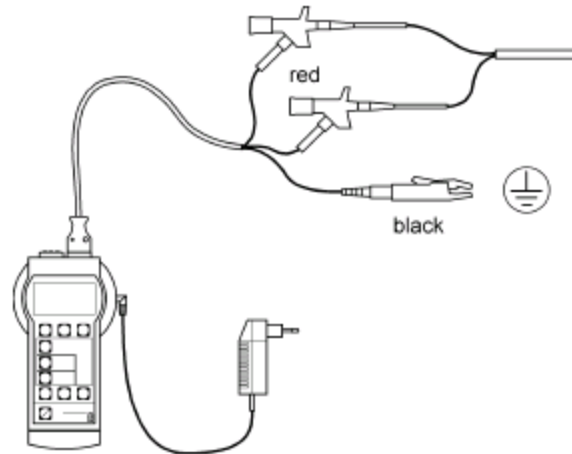


In this case, the measurement is controlled from the device that was used to start the measurement.. In general it is a good idea to start measurements from the SLT-22 (Master). This allows you to make use of the extended functions without any restrictions. The line to be tested is always connected to the **Pair1 terminals**.

2.2.1 Interference when operating on mains supply

The devices have a very wide dynamic range to enable even very small signal levels to be measured accurately.

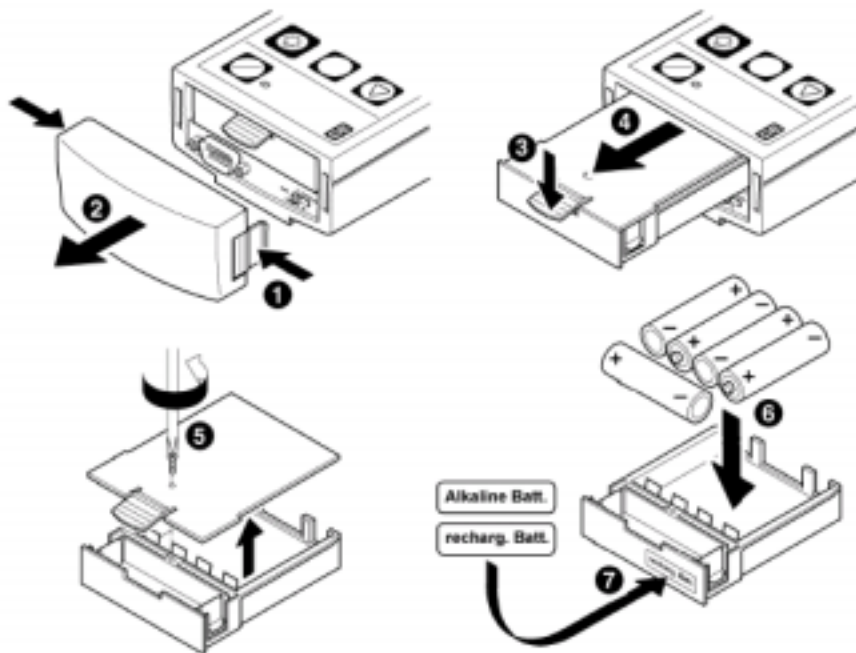
To avoid influencing the results by mains-borne interference, the test set-up should be earthed.



3 Installation / Commissioning

3.1 Fitting alkaline batteries or re-chargeable batteries

Type: 5 x Alkaline batteries, NiCd or MiMH batteries; AA size (Mignon)

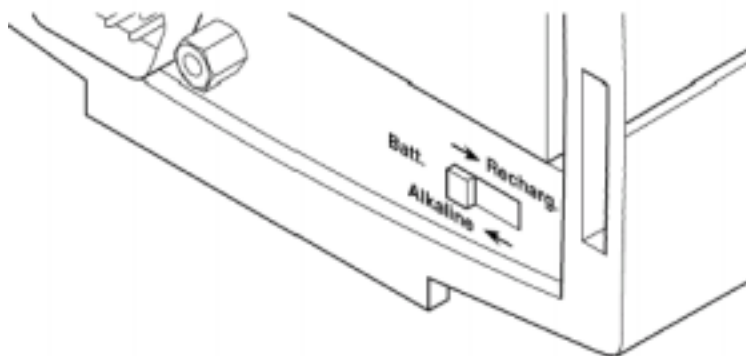


Attach the appropriate label to the face of the battery cassette.

For re-charge. batteries **recharg. Batt.**

For alkaline batteries **Alkaline Batt.**

Check that the cassette has been correctly snapped into position.



Set the **Batt** switch according to whether a re-chargeable or alkaline battery cassette has been fitted.

Rechargeable batteries fitted: Set **Batt.** switch to "**→ Recharg.**"

Alkaline batteries fitted: Set **Batt.** switch to "**Alkaline ←**"



If batteries are charged once, only a few measurements are possible. We recommend the devices be operated on the mains or that sufficient spare batteries be provided.

3.2 Power supply

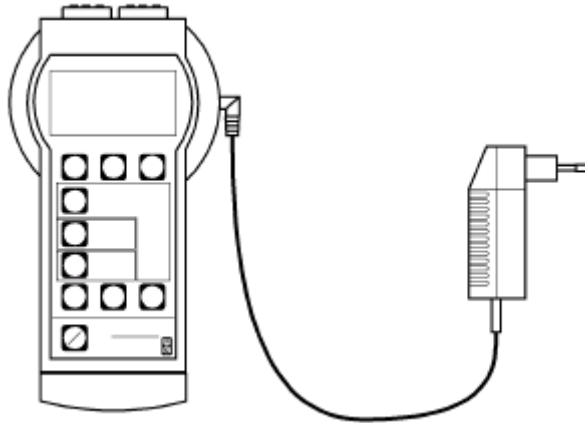
The SLT-11/SLT-22 are suitable for alkaline batteries, rechargeable batteries or mains operation. When operating on batteries, the device automatically switches off if it has not been operated for approximately 5 minutes.

If charge capacity falls below approx. 10% the LED **Low Bat.** lights up.

Leakage and low discharge protection

If the device is not used for a long period, remove the battery cassette from the device.

3.2.1 Recharging batteries / mains operation



Explosion hazard!

Alkaline batteries can explode if an attempt is made to recharge them.

Make sure that the **Batt.** switch is set correctly before connecting the power unit.

Connecting the power unit

Only use the SLT11/SLT22 power unit supplied.

Statuses and display

Status	Requirement	Result
Charge battery	Device switched off	Charge the fitted batteries for 14 hours. The display shows CHARGING . After this the device switches to trickle-charging mode. (Display shows: STANDBY)
Mains operation	Device switched on Batt. switch set to " → Recharg. "	You can carry out measurements and recharge the built-in batteries at the same time
	Device switched on No battery box fitted or Batt. switch set to " Alkaline ← "	Mains operation without charger operation

3.2.2 Switching on the device



- To switch on: Briefly press Start/Stop key
- To switch off Press Start/Stop key > 1s

Each time the device is switched on, it carries out a SELF-TEST which can take up to 30 seconds. The following are checked:

- LED function (visual check by user)
- RAM test
- ROM test
- Performance check

When the self-test has been successfully completed, the device switches automatically to the last measurement mode used.

3.2.3 Resetting the device

In the event of faults or if the device malfunctions, it can be reset to a defined state.

The reset can be carried out as follows:

- Switch the device off and then on again or
- Remove the battery cassette



- Press keys simultaneously

3.2.4 Poll software status



- Press keys simultaneously

4 Functions and configurations

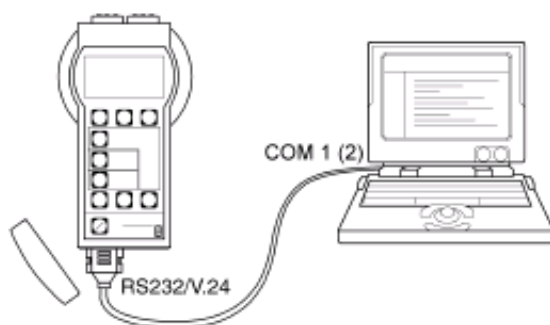
4.1 SLT configuration and transfer software

The test set is delivered from the factory with default templates for the measurement of telecommunication lines. In order to be able to automatically measure Cerberus-specific data transmission circuits, the following steps must be carried out **once** before it is used for the first time.

- Installation of the SLT configuration and transfer software on a service PC
- Transfer of the specific template to SLT-22.

An Intel-based PC or Laptop with a spare RS232 interface is required for the SLT configuration and transfer software.

Connect SLT-11/SLT-22 to the PC



Installing software

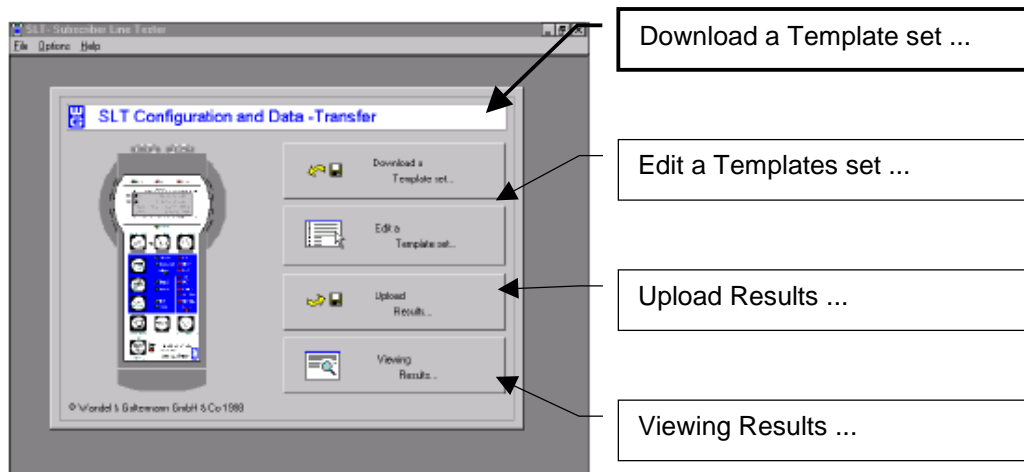
The software must be installed on the PC using the disk supplied.

1. Start the program with "setup.exe".
2. Follow the program instructions

Start software

Start in the program group ACTERNA (Wandel Goltermann) on the entry "SLT Subscriber Line Tester"

- The "Subscriber Line Tester" window is opened.
- Transmission of the Cerberus templates



5 Operation

5.1 Preparations prior to field application

1. Is the test set complete?
2. Has the alkaline battery cassette been fitted, are spare batteries available?
3. Is the rechargeable battery cassette available and are batteries charged? Are spare charged batteries available?
4. Have date and time been set in the device?
5. Has result memory been erased?
6. Has template for Cerberus data lines been loaded and checked to ensure that it is up to date?
7. Has device performance check → SELF TEST been carried out?
8. Obtain information regarding the data line to be measured
 - Type of cable, line cross-sectional area, length of cable
 - Cable installation, location of bus nodes, length of segments

5.1.1 Tolerance masks (Templates)

The following tolerance masks are used for the automatic measuring of a Cerberus data line, e.g.:

Data lines for C-Bus connections CBUVm_Qn

Data lines for LON/CerCom connections LONVm_Qn

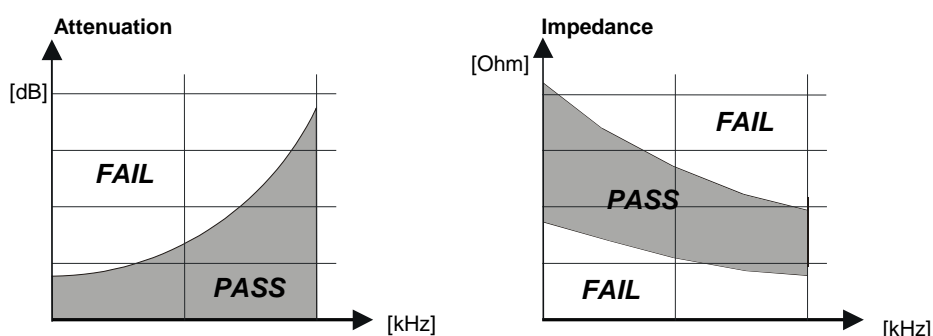
Vm: [V1 ... Vx] Version number

Qn: [Q1 ... Q4] Cable quality which complies with this tolerance.

An automatic test with a Cerberus template covers the following measuring sequence:

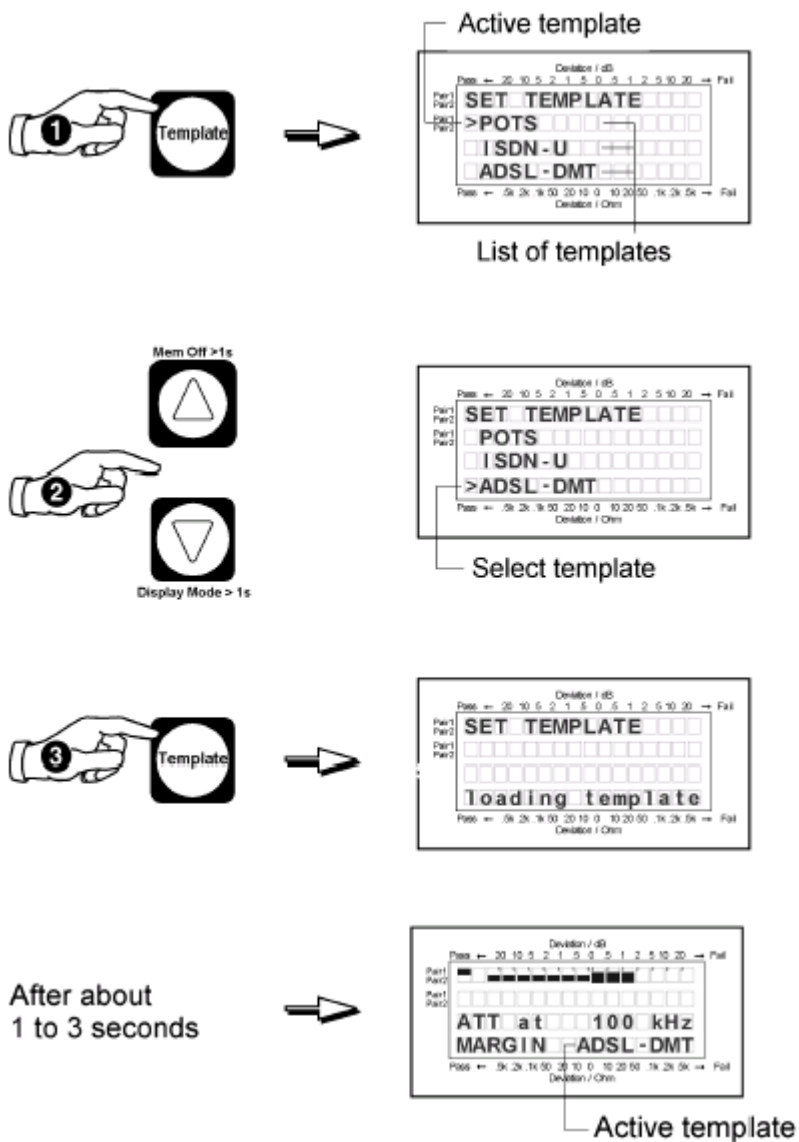
- Cable attenuation (Att) f=30kHz ... 300kHz
- DC cable resistance (DC-R)
- Line impedance (User Def) f=30kHz ... 300kHz

Example of a measuring sequence and its assessment



The cable should be longer than 100 m in order to achieve a valid assessment.

5.1.2 Select template (only SLT-22)

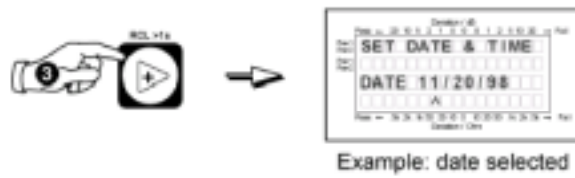


5.1.3 Set date and time (only SLT-22)

Stored measured results are automatically given a time stamp comprising date and time. When making an assessment this enables simple allocation of the measured results.

Date and time are set:

- after the initial commissioning
- after long storage without alkaline batteries or rechargeable batteries



5.1.4 Erasing the result memory



→ Press keys simultaneously for longer than 1 sec.



→ Press key once again for confirmation

5.2 Preparations in the field

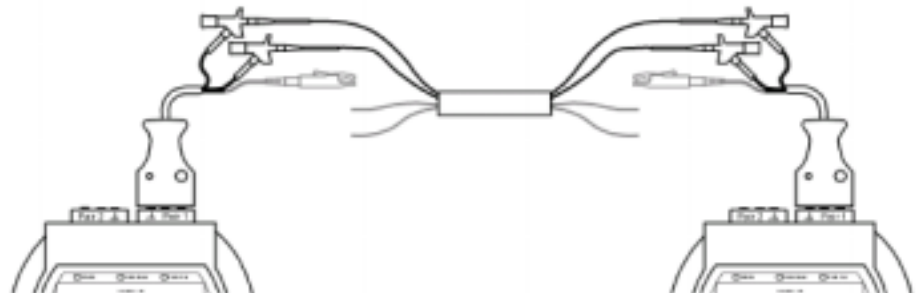
1. The data line must not be live.
2. All bus nodes must be removed from the data line. No electronic components must be connected to the data bus.
3. The individual segments of the data link must be interconnected.
4. The SLT-22 device is connected to terminals "Pair1" near end.
5. The SLT-11 device is connected to terminals "Pair1" far end.

5.2.1 Commissioning of the test set

Connect test specimen

The devices are connected using the safety cables and safety clips supplied. Terminals **Pair1** are used on both devices.

The SLT-22 device is used as actuating device (Master) at the near end and the SLT-11 device (Slave) at the far end.



5.3 Automatic measurement

In the **Auto Test** operating mode all the measuring functions activated in the template are automatically carried out consecutively. The LEDs light up as the corresponding measurement is carried out.

The templates, measured data and result display are always determined by the device (master) used to initiate measurement. Normally this is the device SLT-22. The SLT -11 device (slave) connected at the far end of the line is remote controlled by the master. The first measurement always begins with the template for the highest quality cable.

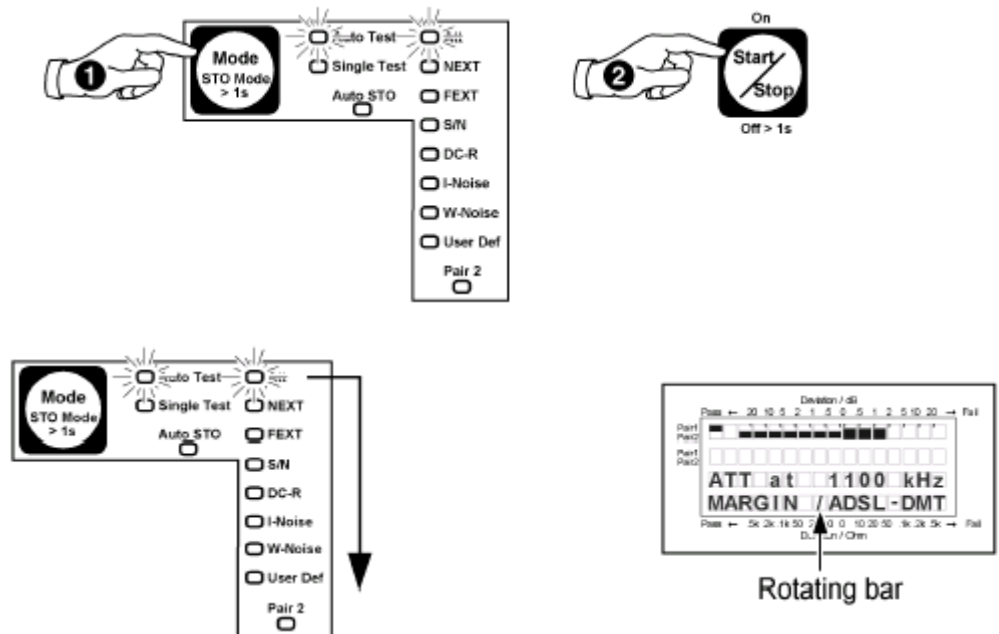
5.3.1 Measurement

1. Select operating mode **Auto Test**

→ LED **Auto Test** lights up

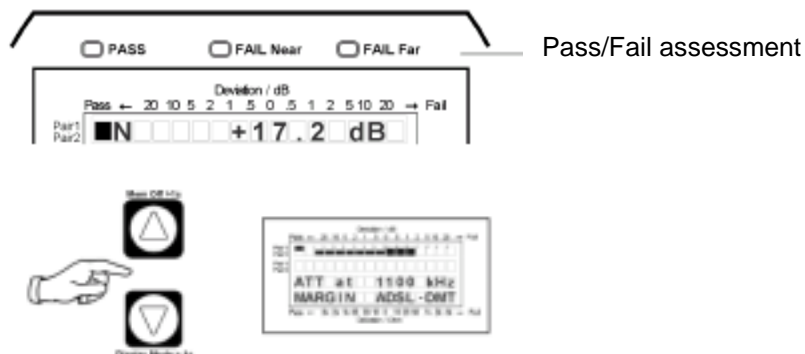
2. Press **Start/Stop** key

→ LED **Att**, **DC-R**, **User Def** lights up, as the measurement is carried out. A measuring sequence lasts approximately 30sec.



3. Display at the end of measuring through Pass/Fail assessment"

- Display **PASS** specified threshold complied with
- Display **FAIL Near** specified threshold **NOT** complied with
- Display **FAIL Far** specified threshold **NOT** complied with



5.3.2 Storing results

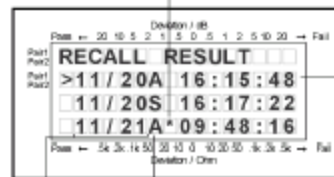


Visible for about one second

5.3.3 Calling up results



Limit value exceeded during measurement



Time

Date A: Auto Test
S: Single Test

Conclude storage display



5.3.4 Assessment of lower quality cable

If during an **Auto Test** the cable is assessed as bad (display FAIL Near or FAIL Far), it must not be used for a maximum length data bus. This cable must only be used for a reduced cable length. The maximum permissible lengths can be worked out with diminished thresholds (templates).

Example for LON and C-Bus

Templates for CerCom/LON	Templates for CBUS	Assessment
LONV1_Q1	CBUSV1_Q1	no reduction of maximum length
LONV1_Q2	CBUSV1_Q2	reduction of maximum length by 15%
LONV1_Q3	CBUSV1_Q3	reduction of maximum length by 30%
LONV1_Q4	CBUSV1_Q4	reduction of maximum length by 50%
Q1 ... Q4 not complied with	-----	reduction of max. length to 500m equivalent to free bus topology
-----	Q1 ... Q4 not complied with	Cable cannot be used

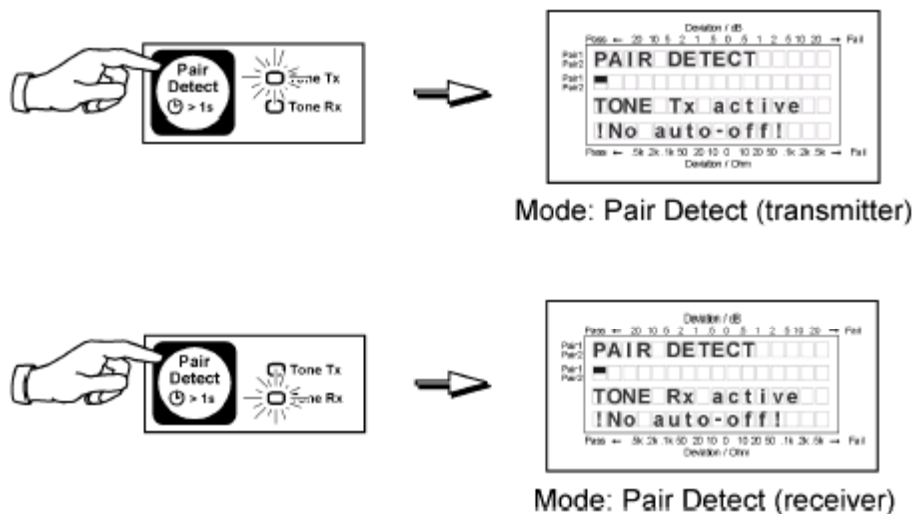
Measures to be taken in the event of an error

LED-LCD display		Comment	Measures
LED	Fail Near lights red	With one measuring function a threshold was exceeded at the near and/or far end	<ul style="list-style-type: none"> - Repeat measurement with diminished threshold - Check cable sections individually
	Fail Far lights red		
	Meas. function lights red		
LCD	Remote not found	The Master does not recognize the partner device	<ul style="list-style-type: none"> - Check continuity - Pair detection - Check cable sections individually For measurement see section 5.3.5
	-----	No results are available	-

5.3.5 Check cable continuity

The function **Pair Detect** simplifies the location of a wire pair in a bundle of cables.

1. On the transmission side generate a signal tone with the **Pair Detect** key
→ LED **Tone TX** lights up green
2. On the receiver side generate a signal tone with the **Pair Detect** key
→ LED **Tone RX** lights up green
→ If continuity is positive a signal tone is sounded



6 Components / Spare parts

The device can be obtained from the manufacturer direct or its sales organizations.
ACTERNA www.acterna.com.

Example: Details for ordering Test Set

Type	Components	Order number Wandel&Goltermann
SLK-12	1 x Subscriber Line Tester SLT-22 1 x Subscriber Line Tester SLT-11 1 x accessory kit comprising: 1 x carrying case for two devices 2 x Mains unit/charger 9.0V (universal version) 4 x Safety test cable (2-wire) 2 x Safety clips (2 crocodile clip, 16 test terminal fine/coarse) 1 x SLT configuration and transfer software 1 x zero modem cable (RS232/V24), 2000mm 2 x Alk. battery / Recharge. battery cassette (empty) 10 x NiMH battery Mignon AA size (UM3), 1,2V/1,1 Ah	BN 2257/12

SLK = Subscriber Line Tester Kit

Details for ordering templates

Templates are supplied by Siemens Building Technologies, Cerberus Division online in the Intranet (OSS).

→ <https://oss.cerberus.ch/swtool/systems/index.html#network>

7 Disposal / Protection of the environment

Alkaline batteries and **rechargeable batteries** contain substances which are harmful for the environment. They must not be thrown away carelessly, but returned to the recycling centre designated for proper disposal. Normally, sales offices take back old alkaline batteries and rechargeable batteries.

Materials from obsolete equipment must be returned to the sales offices or special recycling centres for environmentally-safe disposal.

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