





# Introduction xDSL MULTITEST

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KE3700



KE3550



Wi-Fi antenna (optional)

Ethernet 10/100/1000 Management, Ethernet 10/100/1000 Test port, USB 2

ISDN analogue interface, SFP port\*

Speaker (Telephony)

Display connection status SHDSL

Status LEDs

Battery indicator

Sunlight readable TFT colour display

Connection: USB 1 optional KECT interface

ESC (back) button

Menu-sensitive function keys F1–F4

Menu UP-DOWN/LEFT-RIGHT buttons

Select (enter) button

Shift button: Function keys F5–F8

View button: Back to main menu

Speaker button: Speakerphone

Vol button: Increase volume (3 levels)

☞ button: Increase brightness (3 levels)

Help button: Open the help function

ON/OFF button

Microphone (Telephony)

Alphanumeric keypad

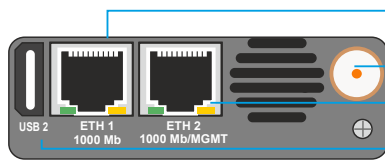
xDSL test port, power supply connection



# Interfaces DSL and Ethernet

## Interfaces DSL and Ethernet

### Ethernet ports (device upper side)



1 GBit/s connection:  
Ethernet tests 10/100/1000 MBit/s

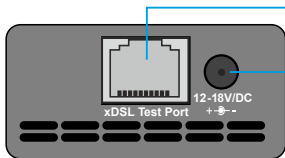
Wi-Fi antenna port  
Device management connection:  
10/100/1000 MBit/s

USB connection: Feature extensions  
(e.g. external Keyboard, external Data storage ...)



Yellow LED link/data: Physical connection layer 1 active  
Green LED: Send/Receive activity

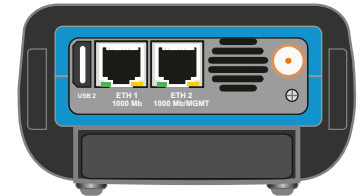
### xDSL ports (device bottom)



xDSL test connections: RJ11 / RJ45

External power cable connection

### Device upper side



### Device bottom side

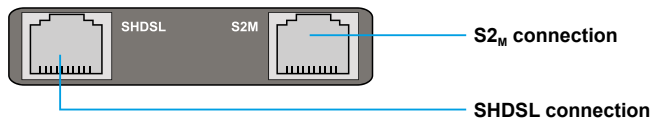




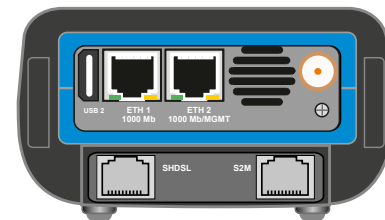
# Interfaces SHDSL and S2<sub>M</sub> (KE3700 only)

## Interfaces SHDSL and S2<sub>M</sub> (KE3700 only)

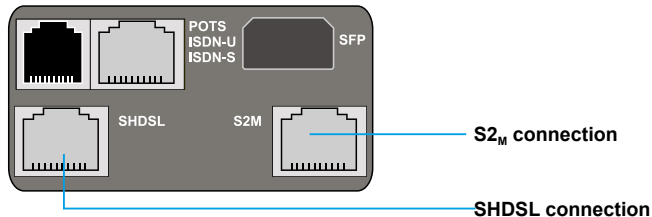
Device upper side



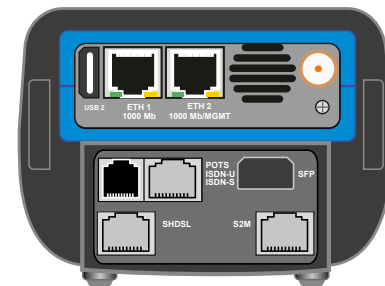
Device upper side



Alternate device upper side



Alternate device upper side

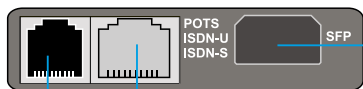




# Interfaces ISDN/analogue and SFP port (SFP KE3700 only)

## Interfaces ISDN/analogue and SFP port (SFP KE3700 only)

Device upper side



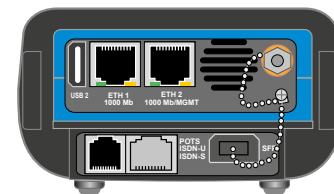
SFP module slot copper/fiber for  
GPON and ethernet measurements  
**Warning: Do not perform a software  
update with a slotted SFP module!**

**RJ45** – S<sub>0</sub> connection

**RJ11** – Analogue telephone connection (POTS)  
– U<sub>K0</sub> connection



Device upper side





# Interfaces for fully-fledged copper tests

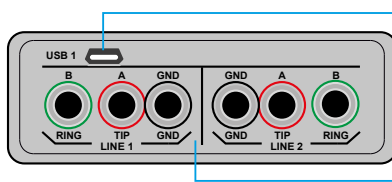
## Interfaces for fully-fledged copper tests



Fully-fledged copper test module for qualification and fault detection on coax cables

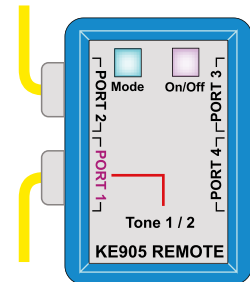
Creation of automatic tests including control function for the KE905 loop test assistant

### KECT copper test module / optional (right device side)



USB connection


KECT connection for copper tests line 1 and line 2 for 2x screened measuring lines with 3-pin TF connector on the device side





# The innovative operating concept

## The innovative operating concept

- <X> deactivated → activate with  key
- <✓> activated → alle inputs complete → Test possible
- <?> activated → Complete input → Test possible
- <!> activated → Correct input → Test not possible

VoIP Parameters	
1	Authentication
2	Password
3	Caller ID
4	Domain
5	User Agent
6	UDP/RTP Port <5,060>
7	UDP/RTP Port Range <0>
8	Stun Server <Off>
9	Registrar <Off>
0	Proxy <Off>

**Attention:**  
Red background = input /  
verification absolutely  
necessary!

The symbols and signal colours help with the configuration of the tests and furthermore indicate missing settings.

The tests are activated through the left/right keys on the device.



# Multitasking and 1-click-operation

## Multitasking and 1-click-operation

**G.993.5 VDSL2 Annex B 17a BDCM Full Vect.**  
VTU-R (Annex B)), Test

Data (Summary)			
	Dn/Near	Up/Far	
Resync-Counter	0		
Net Data Rate	102188	36574	Kbps
Max Data Rate	127552	42487	Kbps
Tx Pwr	13.6	3.3	dBm
Ø SNR-Margin	11.3	6.2	dB
FEC	0	72	
CRC	0	0	
102,188/36,574 kbps		89,088/711 kbps	CRC: <input checked="" type="checkbox"/> FEC: <input checked="" type="checkbox"/>

**F1** **F2** **F3** **F4**

- Quick transition between views and tests with function keys F1 – F4 and F5–F8 via **Shift**

The screenshots shown include:

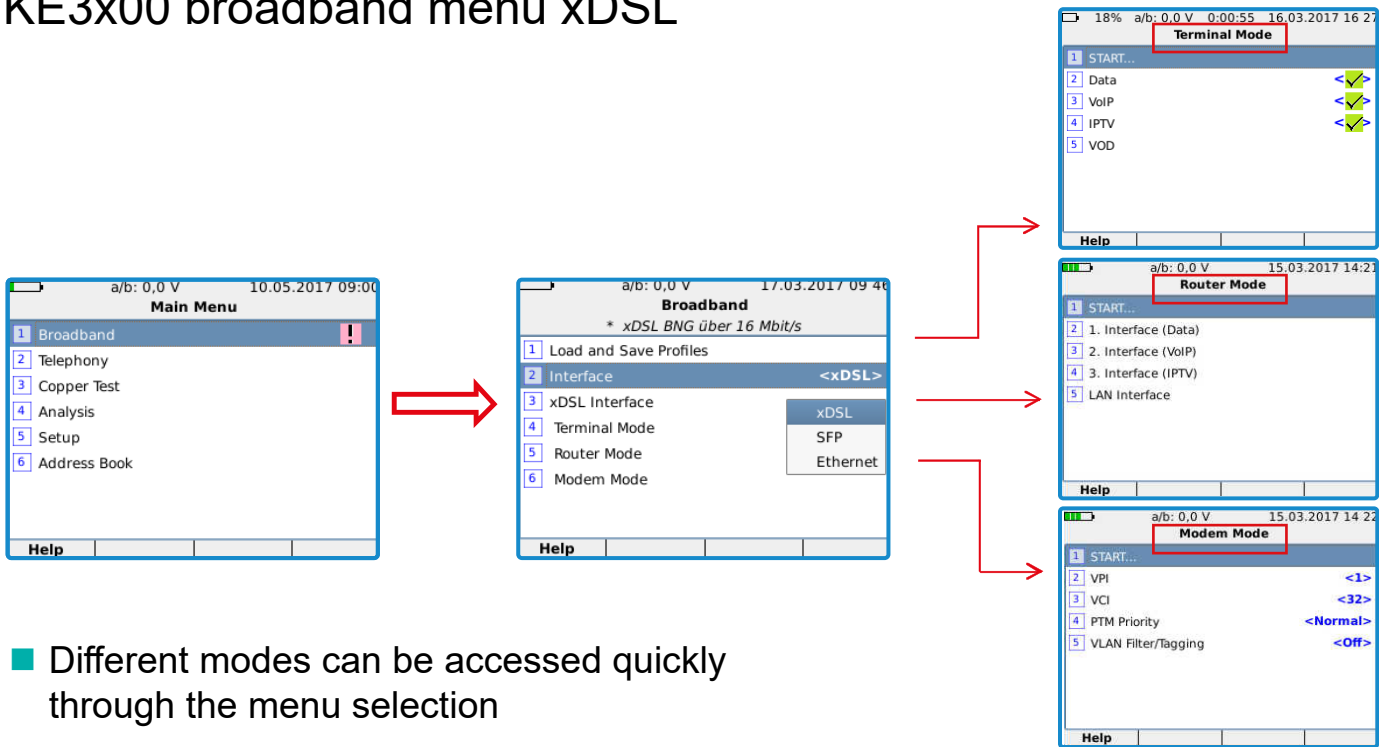
- Bits per tone graph
- SNR per tone graph
- Hlog graph
- QLN graph
- VoIP (Statistic) summary
- IPTV (Statistic) - Das Erste
- IPTV (Preview) - Das Erste





# KE3x00 broadband menu xDSL

## KE3x00 broadband menu xDSL



- Different modes can be accessed quickly through the menu selection



# KE3x00 – xDSL measurements

## KE3x00 – xDSL measurements

19% a/b: 0,0 V 0:01:46 16.03.2017 15 59  
G.993.5 VDSL2 Annex B 17a BDCM Full Vect.  
VTU-R (Annex B)), Test Showtime

Data (Summary)			
1 Line	2 Data	3 VoIP	4 IPTV
Resync-Counter	0		
Net Data Rate	102188	36574	Kbps
Max Data Rate	127552	42487	Kbps
Tx Pwr	13.6	3.3	dBm
Ø SNR-Margin	11.3	6.2	dB
FEC	0	72	
CRC	n	n	
102,188/36,574 kbps		89,088/711 kbps	
CRC: <input checked="" type="checkbox"/> FEC: <input checked="" type="checkbox"/>			

More Views Tests

19% a/b: 0,0 V 0:15:11 16.03.2017 16 46  
G.993.5 VDSL2 Annex B 17a BDCM Full Vect.  
VTU-R (Annex B)), Test Showtime

Data (Summary)			
1 Line	2 Data	3 VoIP	4 IPTV
Ping	---		25.4 ms
Runtime: 0:00:10			
Traceroute	5	62.138.238.100	
Runtime: 0:00:01			
VoIP	+49712197550	1 µs	8 kbit/s
1 of 1 running for 0:30			
IPTV	---		
0 of 1 running for 0:06:34			
Umts	24,204 kbit/s	48,502 kbit/s	
xDSL BNG über 16 Mbit/s			
109,341/39,329 kbps		77,312/2,908 kbps	
CRC: <input checked="" type="checkbox"/> FEC: <input checked="" type="checkbox"/>			

More Views Tests

19% a/b: 0,0 V 0:12:14 16.03.2017 16 43  
G.993.5 VDSL2 Annex B 17a BDCM Vect. running  
VTU-R (Annex B)), Test Showtime

VoIP (Statistic)			
1 Line	2 Data	3 VoIP	4 IPTV
Description	RX	TX	
Bit rate	0	0	Kbit/s
RTP Packets	1174	1180	packets
Packet Loss	0	0	packets
Jitter	0	0	µs
Jitter min/max	0/4	0/7	µs
Delay	0	0	ms
Delay min/max	38/40		ms
R-factor	92	5	
109,341/39,329 kbps		109,341/2,842 kbps	
CRC: <input checked="" type="checkbox"/> FEC: <input checked="" type="checkbox"/>			

More Views Tests

19% a/b: 0,0 V 0:15:32 25.04.2018 16 13  
G.993.5 VDSL2 Annex B 17a BDCM Full Vect.  
VTU-R (Annex B)), Test Showtime

IPTV (Preview) - Das Erste;			
1 Line	2 Data	3 VoIP	4 IPTV
109,341/39,134 kbps		64,000/2,932 kbps	
CRC: <input checked="" type="checkbox"/> FEC: <input checked="" type="checkbox"/>			

More Views Tests Stop





# xDSL connection setup (autotest)

## xDSL connection setup (autotest)

The screenshot shows the 'Data (Summary)' tab of the ATU-R (Annex B) test interface. The status 'Ready' is highlighted in a red box in the top right corner. The interface displays various test results including Ping, Traceroute, Http, FtpDn, and xDSL BNG. The bottom navigation bar includes 'More', 'Views', and 'Tests'.



**Ready** – Tester is ready for a connection setup.

The screenshot shows the 'Data (Summary)' tab of the ATU-R (Annex B/J) test interface. The status 'G.Handshake' is highlighted in a red box in the top right corner. The interface displays various test results including Ping, Traceroute, VoIP, and IPTV. The bottom navigation bar includes 'More', 'Views', and 'Tests'.



**G.Handshake** – G.hs signal from the DSLAM received at the far end.

The screenshot shows the 'Data (Summary)' tab of the ATU-R (Annex B/J) test interface. The status 'Full Initialization' is highlighted in a red box in the top right corner. The interface displays various test results including Ping, Traceroute, VoIP, and IPTV. The bottom navigation bar includes 'More', 'Views', and 'Tests'.



**Full Initialization** – Information exchange and training phase.

The screenshot shows the 'Data (Summary)' tab of the G.993.5 VDSL2 Annex B 17a BDCM Full Vect. test interface. The status 'Showtime' is highlighted in a red box in the top right corner. The interface displays various test results including Resync-Counter, Net Data Rate, Max Data Rate, Tx Pwr, and SNR-Margin. The bottom navigation bar includes 'More', 'Views', and 'Tests'.



**Showtime** – active connection/synchronization. The connection between the DSLAM and the test device has been successfully established.



# Autotest at customer connection

## Autotest at customer connection

Initial test to detect the xDSL service (ADSL, VDSL and VDSL vectoring)

Turn on device → Broadband → Terminal Mode → Press START

The screenshot shows the Autotest interface in Terminal Mode. The main menu is visible on the left, with options: 1. START..., 2. Data, 3. VoIP, 4. IPTV, 5. VOD. The main display area shows the 'Data (Summary)' screen for 'ATU-R (Annex B/), Test'. The status bar at the top indicates '18% a/b: 0,0 V 0:00:55 16.03.2017 16 2'. The 'Data (Summary)' screen displays the following information:

- Line: 1
- Data: 2
- VoIP: 3
- IPTV: 4

The 'Data (Summary)' screen shows the following data:

	Dn/Near	Up/Far	
Resync-Counter	0		
Net Data Rate	102188	36574	Kbps
Max Data Rate	127552	42487	Kbps
Tx Pwr	13.6	3.3	dBm
Ø SNR-Margin	11.3	6.2	dB
FEC	0	72	
CRC	0	0	

The status bar at the bottom of the 'Data (Summary)' screen shows: 102,188/36,574 kbps 89,088/711 kbps CRC:  FEC:

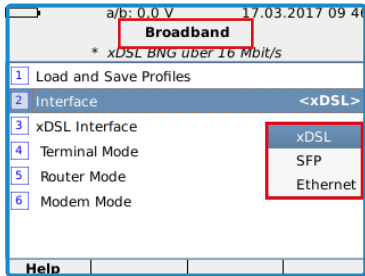
### Important info at a glance:

- DSL type and Annex/variant
- Bandplan/Profile
- External voltage
- Net data rate
- SNR margin
- FEC
- CRC

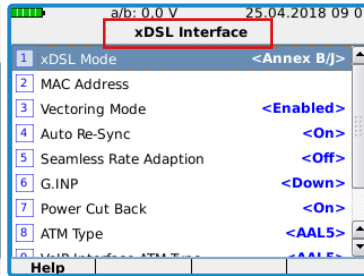


# Configuration dial-in & data tests I (PPPoE)

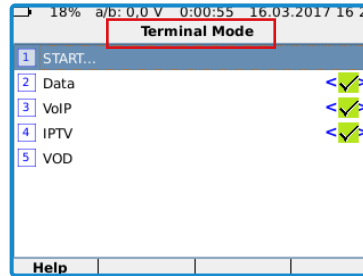
## Configuration dial-in & data tests I (PPPoE)



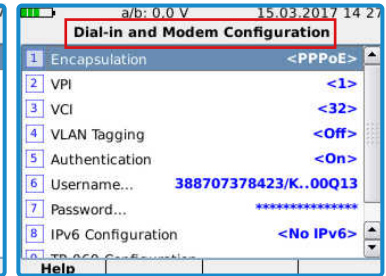
The functions of the terminal mode (Data/VoIP/IPTV) are available via all broadband interfaces active in the unit.



If deviating from the presets, the interface can be configured in this menu.



Terminal mode emulates PC, Smartphone, SIP telephone for VoIP or an IPTV set-top box including TV picture.

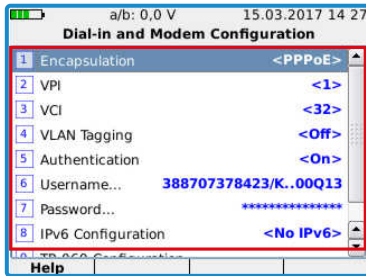


Dial-in configuration with input of the DSL access data of the connection holder or the TR069 settings, for automatic dial-in at BNG connections.

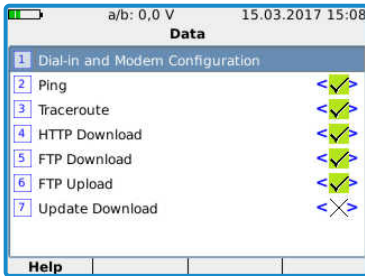


# Configuration dial-in & data tests II (PPPoE) using the example of a telecom connection

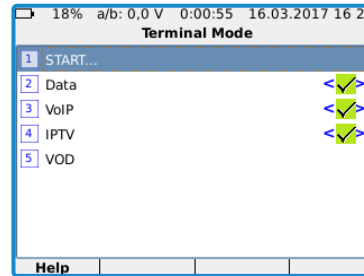
## Configuration dial-in & data tests II (PPPoE) telecom connection



PPPoE dial-up.  
VPI: 1/VCI: 32.  
VLAN tagging on, ID 7,  
for the tests:  
- Data  
- VoIP  
- IPTV



Example shows the execution of the data tests: Ping, FTP up- and download. Optionally, further tests can be configured and set.



After configuring and activating the tests, press „1“ or „Start“ to start measurement.





# Evaluation dial-in & data tests II (PPPoE)

## Evaluation dial-in & data tests II (PPPoE)

Line	Data	VolP	IPTV
1	Local address: 93.237.128.95		
2	Destination: www.t-online.de (62.138.239.100)		
3	Packet size: 256		
4	Packets (TX/RX/loss): 10/10/0%		
5	Time (min/max/avg): 25.188/98.062/42.857 ms		
6	Total time: 9066ms		



A visual display of the ping showing the transmitted packets, packet loss and transmission times

Line	Data	VolP	IPTV
1	36.094 ms 35.996 ms		
2	3 80.157.207.130 28.836 ms 28.945 ms		
3	28.839 ms		
4	4 87.230.114.38 29.729 ms 29.626 ms		
5	29.741 ms		
6	5 62.138.238.100 29.609 ms 29.733 ms		
7	29.625 ms		



Traceroute displays the different routes to the destination server (destination host). In the example: www.t-online.de

Line	Data	VolP	IPTV
1	Http 0 100,00 % 4 581 kbit/s		
2	Http 1 100,00 % 7 100 kbit/s		
3	Http 2 100,00 % 7 307 kbit/s		
4	Http 3 70,57 % 14 683 kbit/s		
5	Http 4 75,65 % 15 964 kbit/s		
6	Average 47 227 kbit/s		
7	Current 54 272 kbit/s		



Overview of running HTTP downloads. In the example: 5 parallel downloads with an average rate of 47 Mbps.

Line	Data	VolP	IPTV
1	FtpUp 0 100,00 % 3 646 kbit/s		
2	FtpUp 1 100,00 % 4 432 kbit/s		
3	FtpUp 2 100,00 % 3 402 kbit/s		
4	FtpUp 3 20,01 % 3 015 kbit/s		
5	Average 3 402 kbit/s		



Example of 100% uploaded FTP uploads with 3.4 to 4.4 Mbps upload speed.



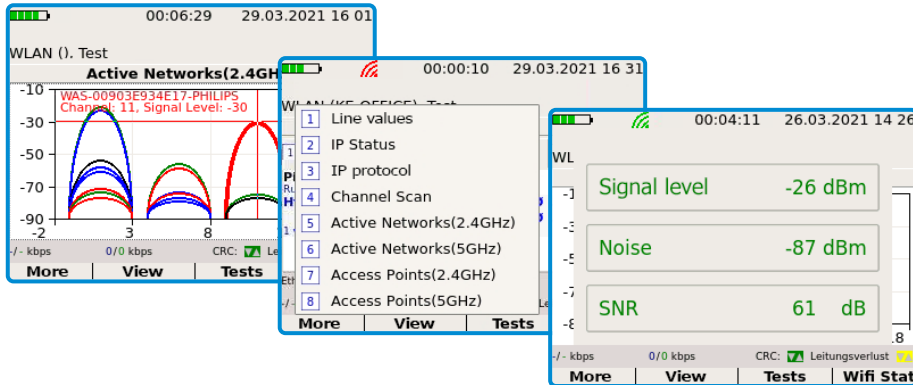


# Wi-Fi function and quality test

## Wi-Fi quick test

Initial test to detect the function and quality of the network

Broadband -> Wi-Fi -> select & join network -> enter test mode



**Important information accessible directly via function key:**

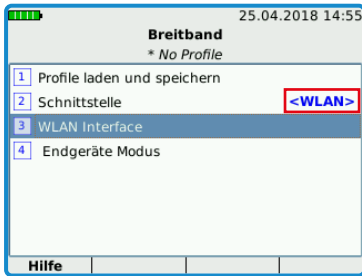
- Connection values
- Overview of active networks
- Channel assignment
- Signal power
- Noise
- Signal-to-noise ratio
- Wi-Fi monitor

- Functional testing and qualification of the network
- Automatic good/bad Evaluation of the parameters

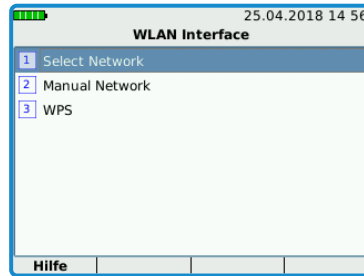


# Configuration data tests I (Wi-Fi)

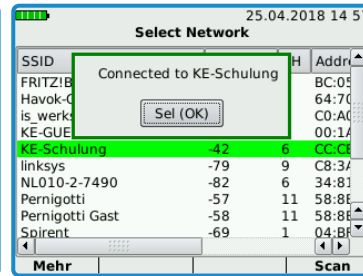
## Configuration data tests I (Wi-Fi)



Activated Wi-Fi interface. The supplied WLAN USB adapter is plugged into the top of the device. Select Wi-Fi interface to join a wireless network.



Selection whether Wi-Fi scan (Select), manual configuration or WPS should be used.



Overview list of available wireless networks with channel, MAC address and signal strength. Joining via key input.



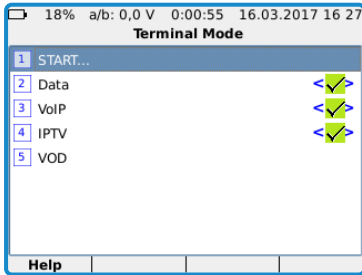
Then select terminal mode for configuring test: Configure and select

- Data
- VoIP
- IPTV tests.

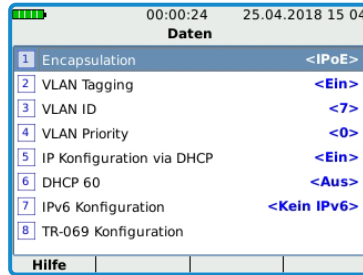


# Configuration data tests II (Wi-Fi)

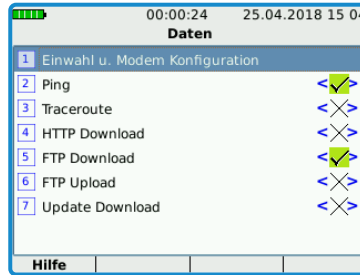
## Configuration data tests II (Wi-Fi)



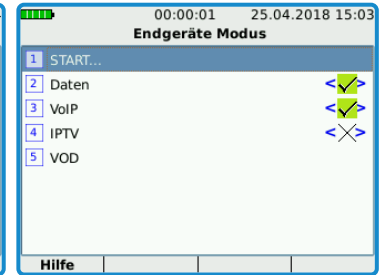
Data: Configuration menu for ping, traceroute, upload tests, download tests and settings of the general IP connection.



Adjust the configuration of the connection. In the example: IPoE connection VLAN (On / 7), obtaining the IP address via DHCP



In the example: Ping test activated and FTP download. Further tests can be configured / selected.



After configuring and activating the tests to start the measurement, select „1“ or „Start“.



# Evaluation in detail I (Wi-Fi)

## Evaluation in detail I (Wi-Fi)

00:07:53 25.04.2018 15 11  
WLAN (KE-Schulung), Test  
IP Status  
1 Leitung 2 Daten 3 VoIP 4 IPTV  
Schnittstelle Beschreibung Wert  
Daten IPv4 IP 192.168.178.26  
Netzmaske 255.255.255.0  
Broadcast 192.168.178.255  
Status Verbunden  
Daten IPv6 IP  
Netzmaske  
Status  
Nameserver 192.168.178.1  
-/ kbps 9,728/0 kbps CRC:  Leitungsverlust



IP status (F2 key) reports „Connected“. The assigned IP address is displayed. In the example IPv4 with 192.168.178.26

a/b: 0.0 V 16.05.2019 16 37  
WLAN (KE-Schulung), Test  
Daten (Übersicht)  
1 Leitung 2 Daten 3 VoIP 4 IPTV  
Ping Runtime: 0:01:54 114 56.1 ms  
VoIP 071219755x 6 µs 63 kbit/s  
FtpDn 8 192 kbit/s 10 667 kbit/s  
1 von 2 läuft für 1:53  
1 von 2 läuft für 0:00:24  
Standard  
-/ kbps 8,192/0 kbps CRC:  Leitungsverlust



Overview of ongoing data tests. In the example ping test, FTP download test and VoIP call to 071219755x.

1 Übersicht IPTV Log  
2 Webbrowser IPTV Statistics  
3 Ping IPTV Preview  
4 Traceroute IPTV Scan  
5 Http Download  
6 FTP Download  
7 FTP Upload  
8 VoIP Log  
9 VoIP Statistics  
0 VoIP Wahl  
Standard  
-/ kbps



F3 shortcut key for a detailed view of active tests. Select FTP download and VoIP download.

00:02:01 25.04.2018 15 05  
WLAN (KE-Schulung), Test  
Daten (FTP-Download)  
1 Leitung 2 Daten 3 VoIP 4 IPTV  
FtpDn 0 28,81 % 5 530 kbit/s  
Übertragen  
-/ kbps 2,560/0 kbps CRC:  Leitungsverlust



FTP download detail page with display of the completed download in % (28.81) and the current download rate (5.5 Mbps).



# Evaluation in detail II (Wi-Fi)

## Evaluation in detail II (Wi-Fi)

00:07:53 25.04.2018 15 11  
WLAN (KE-Schulung), Test  
Data (Ping)  
1 Leitung 2 Daten 3 VoIP 4 IPTV  
Verlorene Pakete: 10%  
Min. Antwortzeit: 24.869ms  
Durchschnittliche Antwortzeit: 378.119ms  
Max. Antwortzeit: 596.758ms  
Gesamtzeit: 9031ms  
-/- kbps 13.824/1.925 kbps CRC:  Leitungsverlust   
Mehr Ansichten Tests



Ping: Loss rate 0%, otherwise repeat test because of packet loss. Select an alternative destination for comparison.

1 Übersicht IPTV Log  
2 Webbrowser IPTV Statistics  
3 Ping IPTV Preview  
4 Traceroute IPTV Scan  
5 Http Download  
6 FTP Download  
7 FTP Upload  
8 VoIP Log  
9 VoIP Statistics  
0 VoIP Wahl



F3 shortcut key for detailed viewing of the active tests. Tests highlighted in black are selectable.

http://www.google.com/  
about:blank  
http://www.google.com/  
http://www.kurthelectronic.de/  
http://en.m.wikipedia.org/wiki/Main\_Page  
Adressbuch  
Google  
Google-Suche Auf gut Glück!



Example: Web browser for visual confirmation of successful Internet access or access to a landing page.

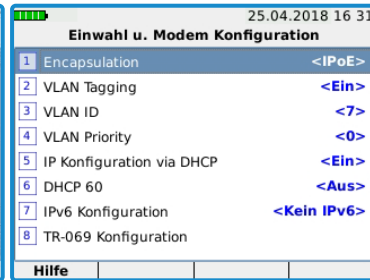


# Configuration VoIP test I (PPPoE)

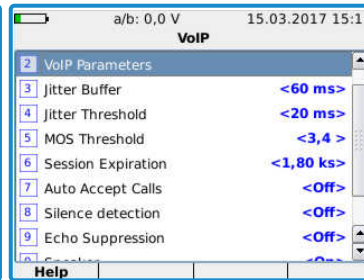
## Configuration VoIP test I (PPPoE)



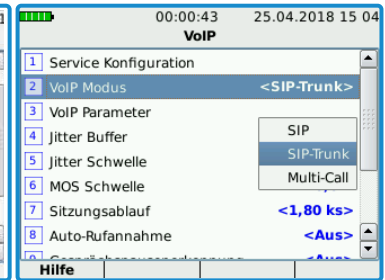
First, the virtual interface must be configured in the terminal mode under Data → Dial-in & Modem configuration. In the example DSL dial-up (PPPoE) + VoIP



Alternatively for Ethernet / SFP / WLAN: IPoE connection. Setting whether VLAN is active and how IP configuration is performed (DHCP or static)



Setting of threshold values for jitter and MOS as well as other general settings for the VoIP connection. Setting whether speech, signal tone or announcement.

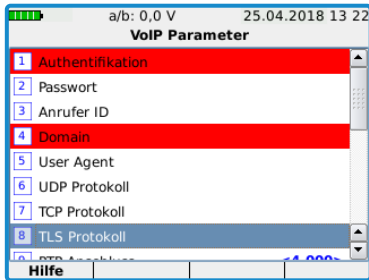


SIP: Device administers a call number. SIP trunk: Device manages trunk with up to 99 call numbers. Multi-Call: Up to 10 VoIP calls in parallel.

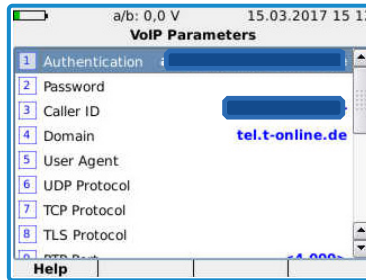


# Configuration VoIP test II (PPPoE)

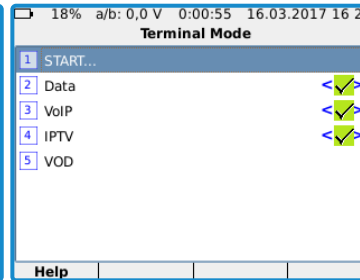
## Configuration VoIP test II (PPPoE)



SIP default configuration  
Enter the data for the connection to the SIP server.  
Login  
Password  
Single phone number...



In addition to the domain and the registrar, protocol settings, codecs and settings for STUN and proxy servers as well as for QOS can be made.



After configuring and activating the tests, press „1“ or „Start“ to start measurement.



# Evaluation VoIP test (PPPoE)

## Evaluation VoIP test (PPPoE)

Example Customer connection with VoIP telephony: **Select terminal device mode** → **Configure VoIP customer recognition** → **Start test**

The image shows three overlapping screenshots of a VoIP test interface. The top-left screenshot shows the 'VoIP (Log)' tab with a '3' in a red box. The middle screenshot shows the 'VoIP (Log)' tab with a '3' in a red box and a '4' in a red box. The bottom-right screenshot shows the 'VoIP (Statistic)' tab with a '3' in a red box and a table of statistics.

Description	RX	TX	
Bit rate	0	0	Kbit/s
RTP Packets	1174	1180	packets
Packet Loss	0	0	packets
Jitter	0	0	µs
Jitter min/max	0/4	0/7	µs
Delay	0		ms
Delay min/max		38/40	ms
B-factor		q2 5	

### Important info at a glance:

- Registration at the SIP server
- RTP packet transfer
- Voice connection (acoustic)
- MOS value above limit
- R-factor value (as alternative to MOS)
- Delay time
- Packet loss rate

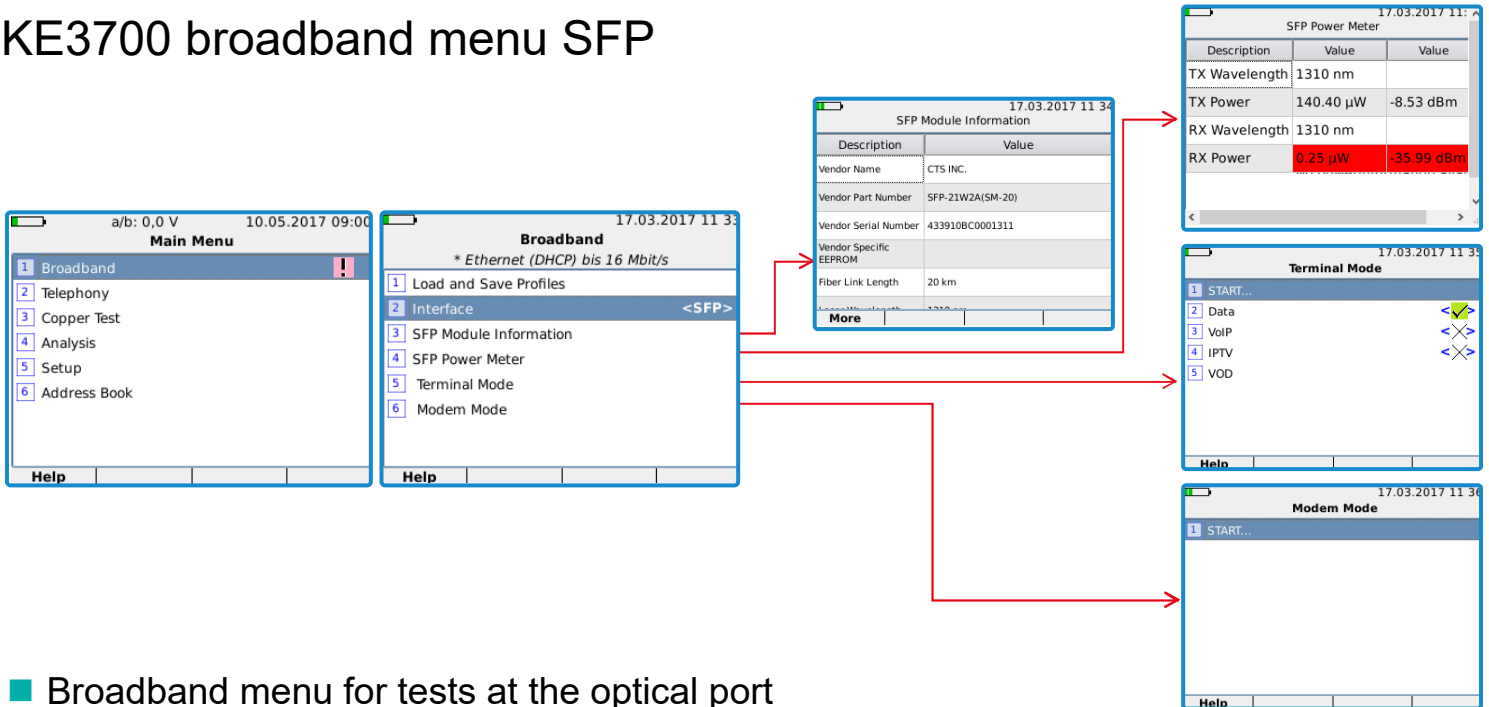
- Functional testing and qualification of the VoIP service
- Quality assessment based on the most important parameters





# KE3700 broadband menu SFP

## KE3700 broadband menu SFP

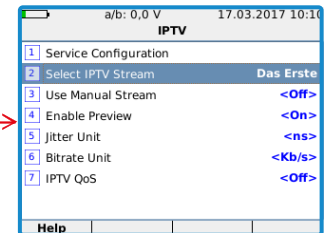
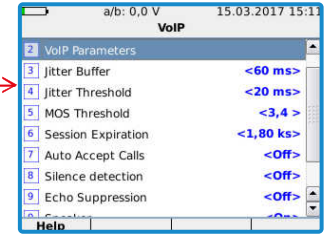
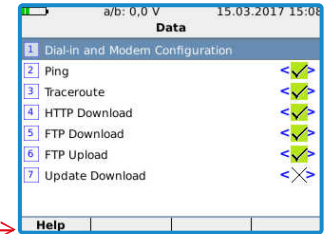
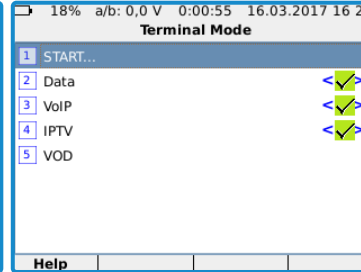
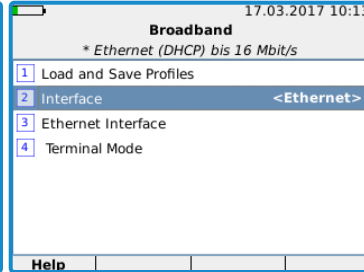
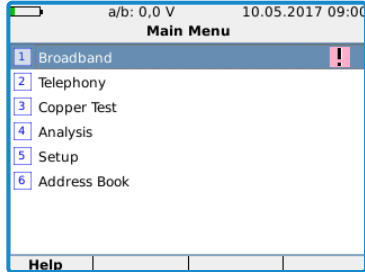


- Broadband menu for tests at the optical port
- SFP level measurement, terminal and modem mode (conv.)



# KE3700 broadband menu ethernet

## KE3700 broadband menu ethernet

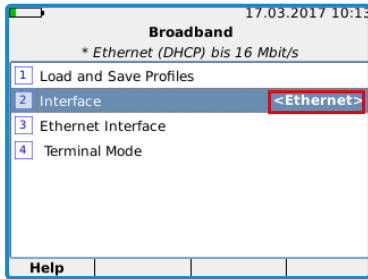


- Broadband menu for tests at the ethernet port
- Terminal mode for IP test data, VoIP and IPTV

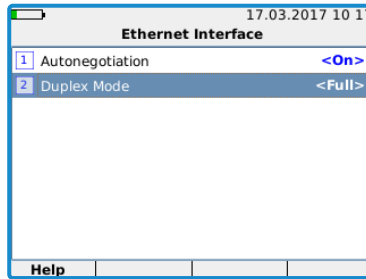


# Configuration data tests I (Ethernet)

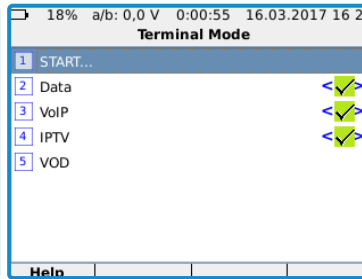
## Configuration data tests I (Ethernet)



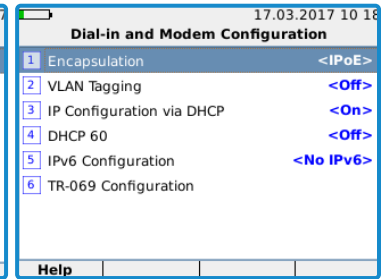
Activated ethernet interface.  
Subsequently, terminal mode is selected for the IP tests.



The default settings of the ethernet interface can usually be adopted.



Terminal mode emulates PC, Smart-phone, SIP telephone for VoIP or an IPTV set-top box including TV picture.

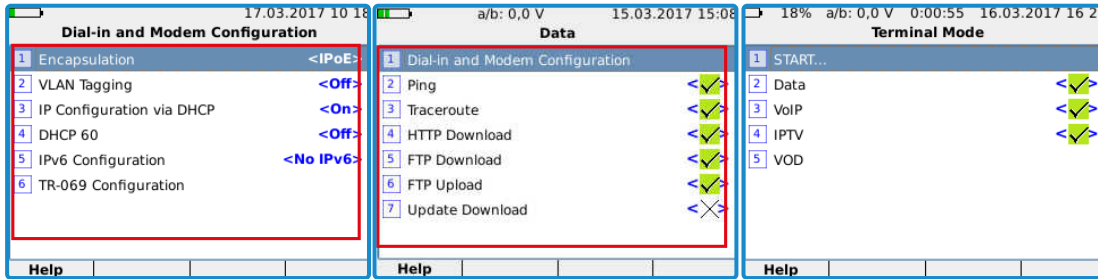


Dial-in configuration with input of the definition whether to use DHCP or fixed IP address range. VLAN setting possible.



# Configuration data tests II (Ethernet)

## Configuration data tests II (Ethernet)



Example: Test directly behind a Telekom Speedport (router). LAN port of the KE3x00! IPoE connection, IP address via DHCP

Example shows the execution of all available tests. Recommendation: Ping test as well as FTP up- and download tests

After configuring and activating the tests, press „1“ or „Start“ to start measurement.



# KE3x00 – ethernet tests

## KE3x00 – ethernet tests

19% 16.03.2017 16:52 Ethernet, Test

IP Status			
1 Line	2 Data	3 VoIP	4 IPTV
Interface	Description	Value	
Data IPv4	IP	169.254.88.246	
	Netmask	255.255.0.0	
	Broadcast	169.254.255.255	
	Status	Ready	
Data IPv6	IP		
	Netmask		
	Status		
Nameserver		194.25.2.129	

19% 16.03.2017 16:52 Ethernet, Test

Line Values			
1 Line	2 Data	3 VoIP	4 IPTV
Data Rate RX	0.00	Mb/s	
Data Rate TX	0.00	Mb/s	
Packets RX	4272874944		
Packets TX	4290050392		
Packets Dropped RX	0		
Packets Dropped TX	0		
Traffic R X	0.00	MR	

20% 16.03.2017 16:52 Ethernet, Test

Line Values			
1 Line	2 Data	3 VoIP	4 IPTV
Ping	Runtime:		
Traceroute	Runtime:		
VoIP	0 of 1	Disconnected	
IPTV	0 of 0		
Mbps	0 bit/s		
xDSL BNG über 16 Mbit/s			

25.04.2018 16:41 a/b: 0.0 V 0:09:31 G.993.5 VDSL2 Annex B 17a BDCM Full Vect. VTU-R (A) Showtime

Answer call? From: +49712197550 To: +497121820359

Esc (No) Sel (Yes)

25.4 ms

238.100

1 of 1 Ping Runtime: 0 Traceroute Runtime: 0

VoIP 1 of 1 Connected

IPTV ---

0 of 1 running for 0:00:52

xDSL BNG über 16 Mbit/s

109.341/39.329 kbps 98.816/2.572 kbps CRC: Line Loss: FEC: 23





# Evaluation Data tests I (Ethernet)

## Evaluation Data tests I(Ethernet)

Ethernet, Test

IP Status

1 Leitung 2 Daten 3 VoIP 4 IPTV

Schnittstelle	Beschreibung	Wert
Daten IPv4	IP	192.168.2.103
	Netzmaske	255.255.255.0
	Broadcast	192.168.2.255
	Status	Verbunden
Daten IPv6	IP	2003:6D:6D23:8B7B:201:COFF...
	Netzmaske	FFFF:FFFF:FFFF:FFFF:
	Status	FE80::201:COFFFE14:C81E%...
	Nameserver	192.168.2.1

Nameserver: 192.168.2.1

Leitungsverlust:

Mehr Ansichten Tests Pause



IP interface connected and with received IP address.  
In the example IPv4 with 192.168.2.103.

Ethernet, Test

Line Values

1 Line 2 Data 3 VoIP 4 IPTV

Link	Down
Autonegotiation	Yes
Speed	10 Mb/s
Duplex	Half
Utilisation	0.00 %
Data Rate RX	0.00 Mb/s
Data Rate TX	0.00 Mb/s

Leitungsverlust:  Line Loss:

More Views Tests



Link Up (active), Gigabit Link. Tests are started, line values displayed. Display of Data rate, packets and data volume, etc.

Ethernet, Test

Line Values

1 Line 2 Data 3 VoIP 4 IPTV

Data Rate RX	0.00 Mb/s
Data Rate TX	0.00 Mb/s
Packets RX	4272874944
Packets TX	4290050392
Packets Dropped RX	0
Packets Dropped TX	0
Traffic RX	0.00 MR
Traffic TX	0.00 MR

Leitungsverlust:  Line Loss:

More Views Tests



Data rate details RX = received, TX = sent are displayed

Ethernet, Test

Line Values

1 Line 2 Data 3 VoIP 4 IPTV

Packets Dropped TX	0
Traffic RX	0.00 MB
Traffic TX	0.00 MB
CRC	0
Runt	0
Jabber	0

Leitungsverlust:  Line Loss:

More Views Tests



Display of checksum errors CRC, run (smaller bytes than allowed) and Jabber (interrupt procedure for stations that are too long).



# Evaluation Data tests II (Ethernet)

## Evaluation Data tests II (Ethernet)

19% a/b: 0,0 V 0:18:02 16.03.2017 16:49  
G.993.5 VDSL2 Annex B 17a BDCM Full Vect.  
VTU-R (Annex B/J), Test Showtime

**Data (Ping)**

1 Line 2 Data 3 VoIP 4 IPTV

Local address: 93.237.128.95  
Destination: www.t-online.de (62.138.239.100)  
Packet size: 256  
**Packets (TX/RX/loss): 10/10/0%**  
Time (min/max/avg): 25.188/98.062/42.857 ms  
Total time: 9066ms

109,341/39,329 kbps 81,408/3,735 kbps CRC:  FEC:

More Views Tests



Estimated Ping times:  
ADSL < 100 ms  
VDSL < 30 ms  
FTTH < 20 ms  
Loss rate 0%, repeat the test otherwise!

19% a/b: 0,0 V 0:20:31 16.03.2017 16:52  
Ethernet, Test

**Data (Summary)**

1 Line 2 Data 3 VoIP 4 IPTV

Ping 38.8 ms  
RunTime: 0:00:12

Traceroute 5 62.138.238.100  
RunTime: 0:00:03

VoIP Connected

IPTV 0 of 1 running for 0:00:23

xDSL BNG über 16 Mbit/s IPv4 IPv6

102,188/36,574 kbps 87,040/2,744 kbps CRC:  FEC:

More Views Tests



Overview of ongoing data tests. In the example Ping test, traceroute test, one VoIP test and one IPTV test.

19% a/b: 0,0 V 0:20:31 16.03.2017 16:52  
Ethernet, Test

**Data (HTTP Download)**

1 Line 2 Data 3 VoIP 4 IPTV

Line	Data	VoIP	IPTV
Http 0 Finished	100,00 %	4 581 kbit/s	
Http 1 Finished	100,00 %	7 100 kbit/s	
Http 2 Finished	100,00 %	7 307 kbit/s	
Http 3 Transfer	70,57 %	14 683 kbit/s	
Http 4 Transfer	75,65 %	15 964 kbit/s	

Duration 0:11:51  
Average 47 227 kbit/s  
Current 54 272 kbit/s

-/- kbps 0/0 kbps CRC:  Line Loss

More Views Tests



Overview of the current FTP downloads with an average download rate of approx. 47 Mbps.

19% a/b: 0,0 V 0:20:58 16.03.2017 16:52  
Ethernet, Test

**Data (FTP-Upload)**

1 Line 2 Data 3 VoIP 4 IPTV

Line	Data	VoIP	IPTV
FtpUp 0 Transfer	100,00 %		3 646 kbit/s
FtpUp 1 Transfer	100,00 %		4 432 kbit/s
FtpUp 2 Transfer	100,00 %		3 402 kbit/s
FtpUp 3 Transfer	20,01 %		3 015 kbit/s

-/- kbps 0/0 kbps CRC:  Line Loss

More Views Tests

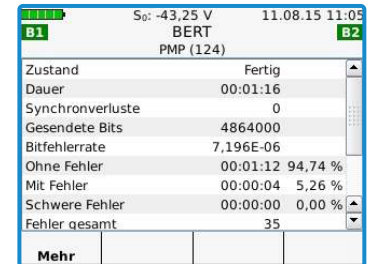
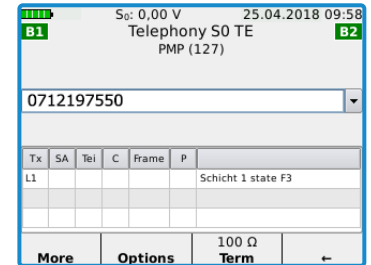
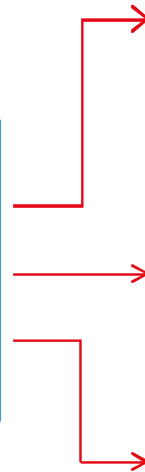
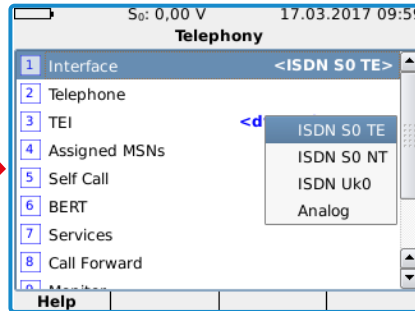
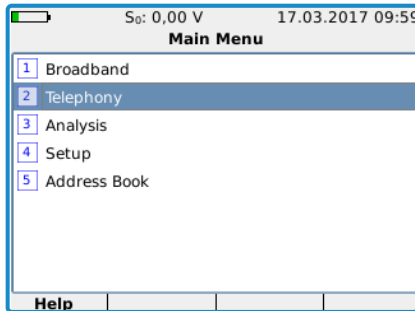


View of 3 transmission that are already transferred to 100% and an upload of about 20% with an average of approx. 3 Mbps.



# KE3x00 ISDN menu

## KE3x00 ISDN menu



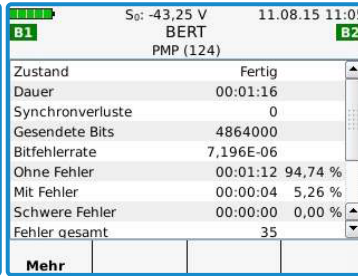
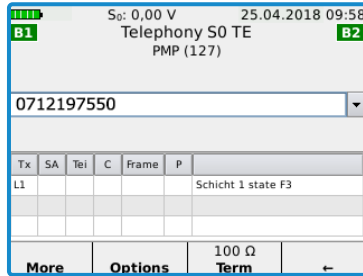
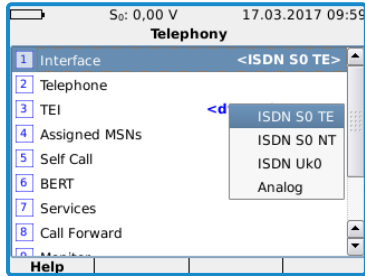
- Telephony menu for tests at telephone connections
- ISDN UK<sub>0</sub> (before NTBA), S<sub>0</sub> (after NTBA) and analogue





# KE3x00 – ISDN/Analogue

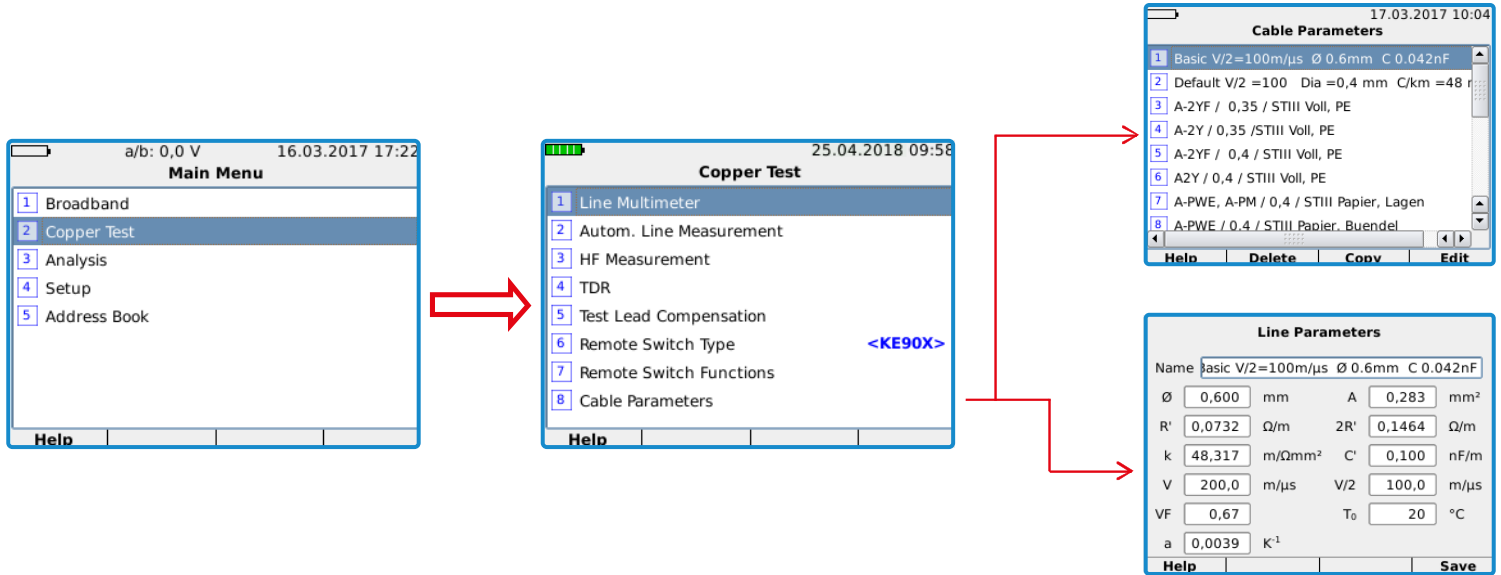
## KE3x00 – ISDN/Analogue





# Coppertest menu cable parameters

## Coppertest menu cable parameters



- Coppertest menu for cable measurement for suitability and errors
- Select cable parameters or edit them manually



# Coppertest menu autotest

## Coppertest menu autotest

The image displays four screenshots of the Coppertest menu and its sub-menus:

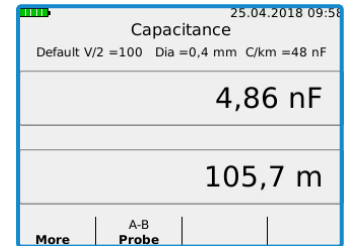
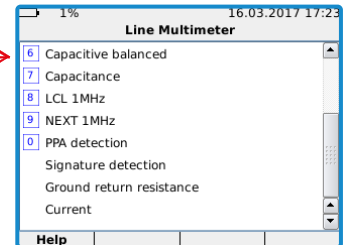
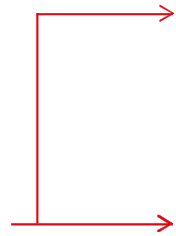
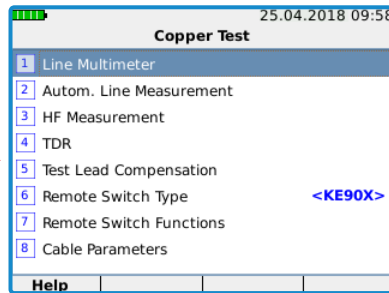
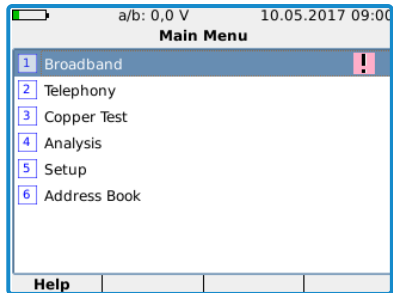
- Copper Test** (25.04.2018 09:58):
  - 1 Line Multimeter
  - 2 Autom. Line Measurement
  - 3 HF Measurement
  - 4 TDR
  - 5 Test Lead Compensation
  - 6 Remote Switch Type <KE90X>
  - 7 Remote Switch Functions
  - 8 Cable Parameters
- Loop Analysis Sequence** (25.04.2018 09:58) (New sequence):
  - Default V/2 =100 Dia =0,4 mm C/km =48 nF
  - 1 Measurement
    - Wire check
    - Voltage
    - Current
    - Resistance
  - 2 DSL qualification
    - Capacitance
  - 3 Control
    - Insulation
- Loop Analysis Sequence** (16.03.2017 17:26) (New sequence):
  - Default V/2 =100 Dia =0,4 mm C/km =48 nF
  - 1 New sequence
  - 2 Load sequence...
  - 3 Save sequence
  - 4 Delete sequence
  - 5 Help
- Stored Analysis Sequences** (16.03.2017 17:26):
  - 1 2- Qualitätstest mit MH
  - 2 1- Schnelltest ohne MH
  - 3 3- TAL R & ISO mit MH
  - 4 4- TAL R, C, ISO & LCL mit MH
- Loop Analysis Sequence** (21.10.2020 16:36) (1- Schnelltest ohne MH):
  - Default V/2 =100 Dia =0,4 mm C/km =48 nF
  - Voltage measurement A-B, DC
  - Voltage measurement A-Gnd, DC
  - Voltage measurement B-Gnd, DC
  - Capacitance measurement Unsymmetry
  - Insulation measurement A-B, 100 V
  - Insulation measurement A-Gnd, 100 V
  - Insulation measurement B-Gnd, 100 V

- Coppertest menu for cable measurement for suitability and errors
- Select defined autotest or edit a new test



# Coppertest menu DMM

## Coppertest menu DMM

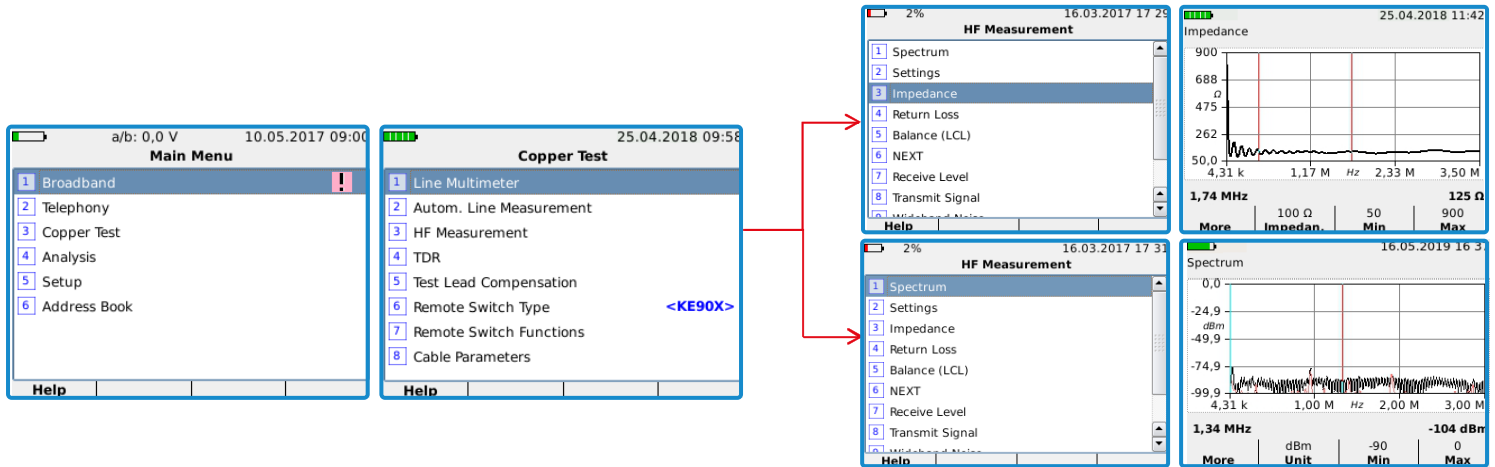


- Coppertest menu for cable measurement for suitability and errors
- Line multimeter for testing external voltage etc.



# Coppertest menu HF measurement

## Coppertest menu HF measurement

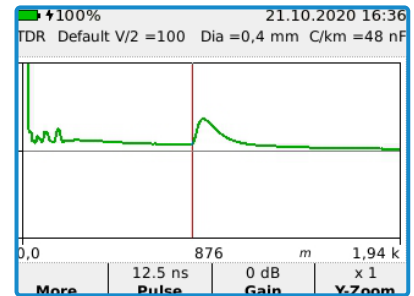
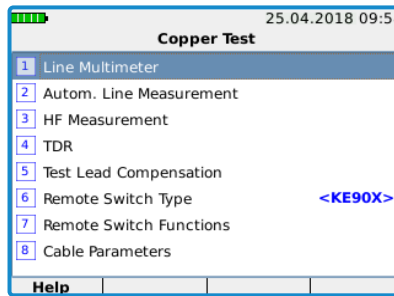
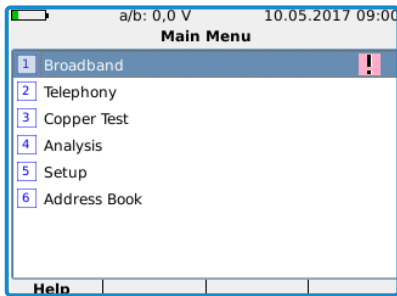


- Coppertest menu for cable measurement for suitability and errors
- RF measurement for evaluation of the transmission quality and detection of interferences



# Coppertest menu TDR measurement

## Coppertest menu TDR measurement

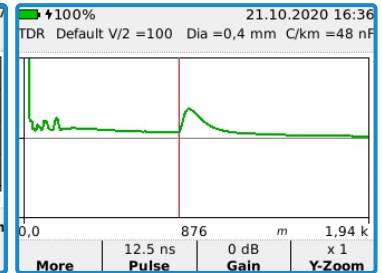
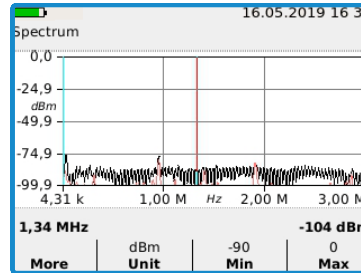
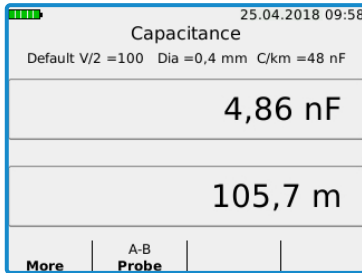
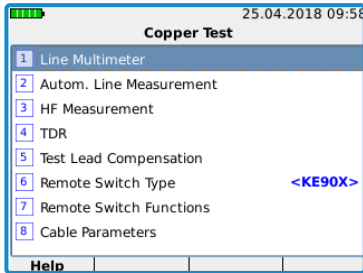


- Coppertest menu for cable measurement for suitability and errors
- TDR measurement for meter-accurate localization of cable errors and damage



# KE3x00 – Coppertests

## KE3x00 – Coppertests









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