Siemens K1103

Protocol Tester

$1895.00

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Tektronix

Protocol Tester

K1103

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› Features
Specs

FEATURES

Customized Signaling Analyses of CCS#7, GSM, CDMA, ISDN D-Channel, X.25, V5.1, V5.2, PHI

- Monitoring of up to Eight Signaling Channels on Four PCM Links
- For PCM30, PCM24 and V./X. (V.24, V.35, X.21)
- Simple Operation as with a PC with MS-DOS and Windows
- Programmed Applications for Fast Problem Analysis

APPLICATIONS

- The Protocol Tester K1103 has been developed for network supervision and network analysis of CCS#7, GSM, CDMA, ISDN D-channel, X.25 and V5.x protocols. A maximum of four different PCM links ($T1/S_{2M}$) or V./X. links with up to eight signaling links (64 kbit/s, 56 kbit/s, 16 kbit/s) can be supervised simultaneously
- The Protocol Tester K1103 features a Windows 3.11 based user interface
- Analysis of the different layers of the communications protocols can be performed online or offline. The auto-restart mechanism enables long-term measurements to be carried out, e.g., following a power failure. User-specific prepared measurement tools for supporting measurements in the field are also supplied. Automatic evaluation of these measurements, alphanumerically and/or in graphics form, is performed by a special statistics program package. A storage capacity of 2.5 MB in the main memory and 500 MB on the hard disk is available for recording the measurement data. A floppy disk drive can additionally be used for recording measured data

Design

The Protocol Tester K1103 consists of a PC card with 8 MB RAM, a 540 MB hard disk and a 1.44 MB floppy disk. A TFT color display, which can be read without impairment even under bad lighting conditions, is used as the display. Graphics control is by means of a VGA card.

The keyboard can, if necessary, be removed from the tester in order to enable more comfortable working. MS-DOS 6.2 is used as the operating system.

Line activities are displayed on LEDs on the front of the instrument.

The actual measuring hardware employs obsolescence-proof technology. The processing power, for example, is increased by using transputers.

A serial interface for remote control, a printer interface (serial/parallel), as well as a VGA interface for external monitors, are available.

Special Features

The K1103 features particularly easy handling. This comprises:

- Putting the test hardware and software into service
- Connecting to the PCM links (S_{2M}/T1) or V./X. links
- Protocol detection
- Link selection

The test modules can be inserted in the Protocol Tester K1103 simply by plugging them in. No further hardware settings or reconfiguration is required as this is executed at a keystroke by the testing software provided. When the K1103 is connected to the PCM links, the autoconfiguration function determines the signaling channel search and the framing search. No preliminary manual settings are required. As soon as the autoconfiguration is completed, all the active signaling channels are available and can be displayed simultaneously or separately on the screen. Again a keystroke is all that is needed to select a particular link and thus reduce the screen display to the required data.

The Protocol Tester K1103 also has a wide and impressive range of powerful display formats. Message components from any source are decoded on-line and to the maximum possible depth if required. All the important message parts are output not only in binary or hexadecimal but also in mnemonic form (on-line and off-line in parallel). Special search functions permit selective tracing of any desired message parts, e.g., an IMSI/TMSI (International/Temporary Mobile Subscriber Identification).

Fig. 1 SCCP-HLR data exchange in the GSM.

Description of Application Options for CCS#7.

Analysis of signaling over a linkset between two switching systems

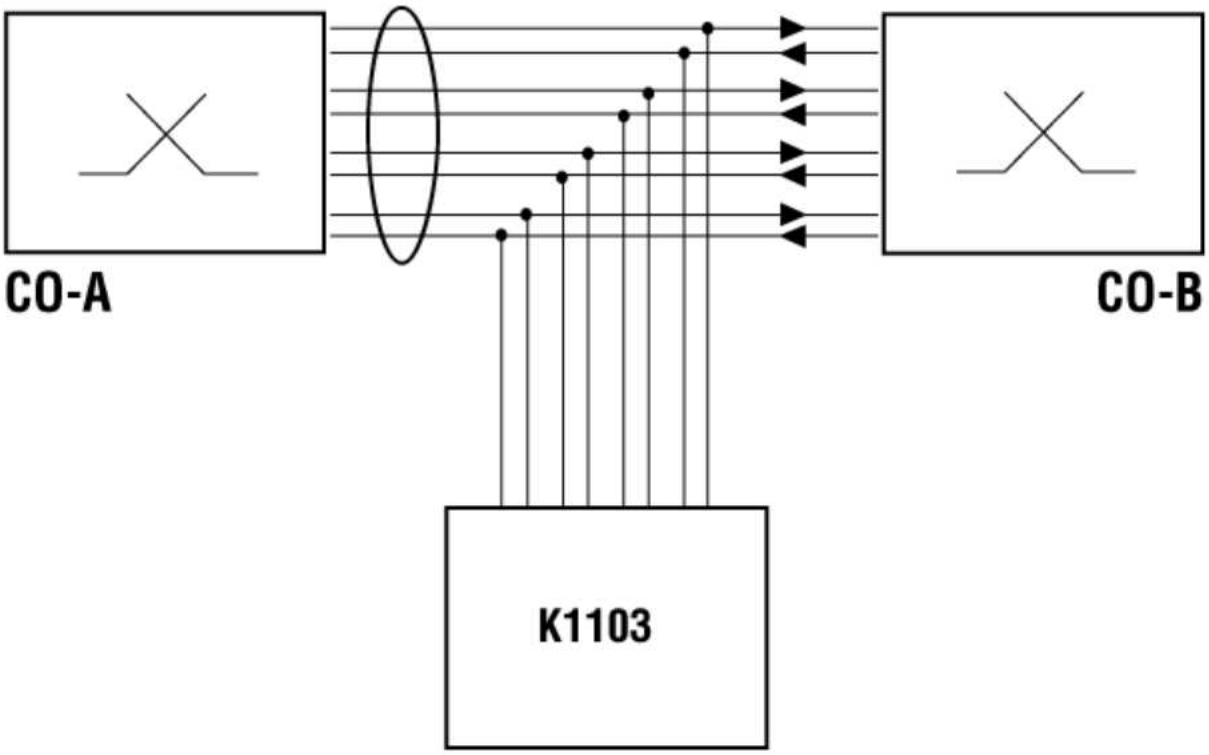


Fig. 2 Analysis of a linkset with 4 signaling links.

Interexchange signaling with CCS#7 is not performed via one signaling link during real operation, since failure of this link would result in failure of up to 1000 traffic channels. A number of signaling links - 2 to 4 depending on traffic - are therefore combined to form a so-called linkset. Since the loadsharing mechanism in the switching system does not allow the signaling link for a particular call to be predicted within a signaling linkset, all signaling links between two switching systems must be supervised simultaneously.

Analysis of signaling on two linksets

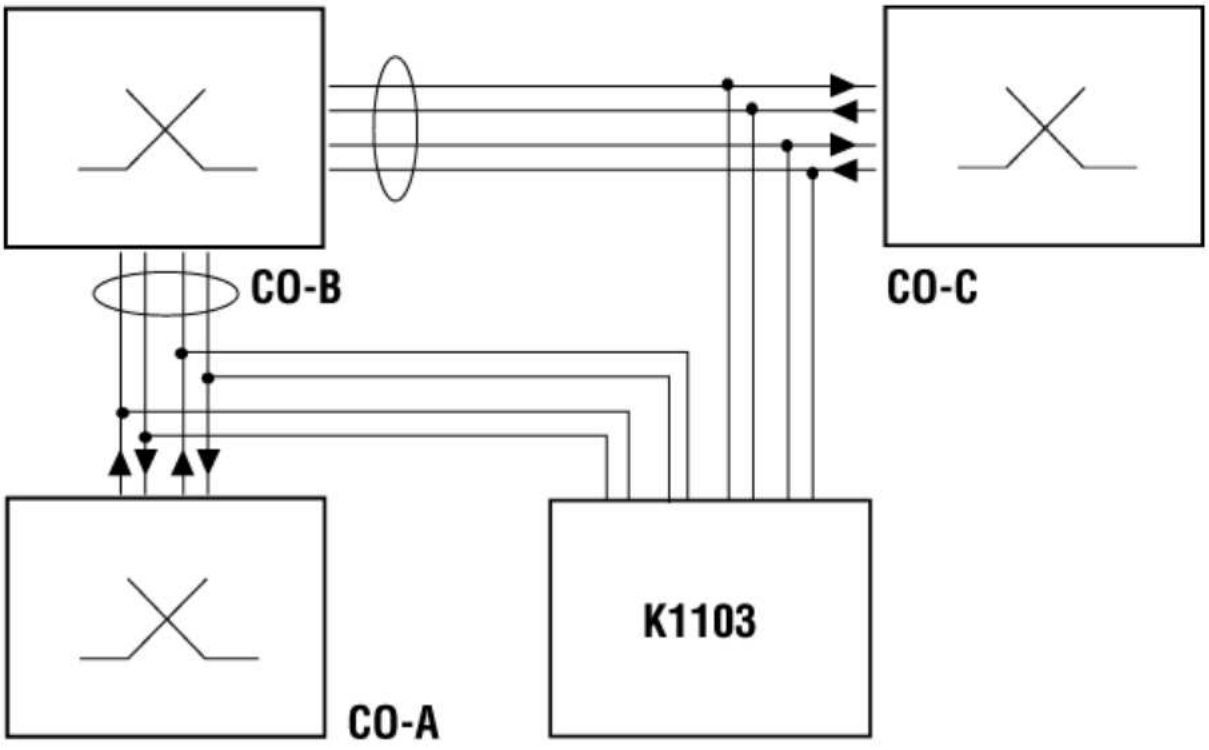


Fig. 3 Analysis of two linksets each with two signaling links.

In order to test the operability, behavior and switching times of a switching system, its input and output linksets must be analyzed simultaneously. Since, as a rule, 2 signaling links are combined in a linkset, 4 signaling links must be supervised simultaneously.

CO-A National switching system

CO-B Foreign switching system

CO-C International switching system

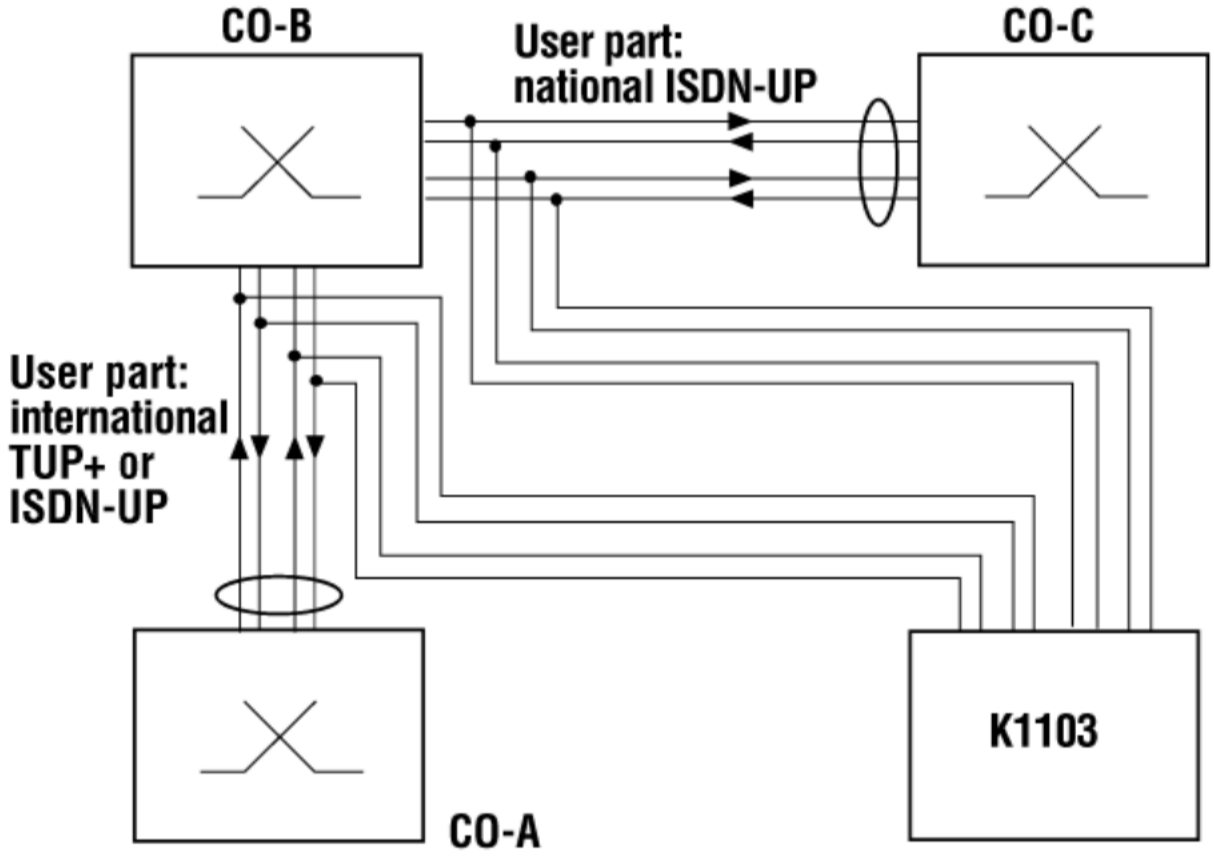


Fig. 4 Analysis of two linksets on two international interfaces.

Another application consists of observing network interfaces (from national to international network). It must be possible to analyze different protocols simultaneously for this application.

Interfaces

Connections -

4 x PCM30 or PCM24

4 x D-sub 9-contact

or 4 x V./X. (V.35, V.24, X.21)

Software/Operating Modes -

Measurement tools

Statistics

Monitor

Protocols -

MTP Q.701-Q.704, Q.707-Q.709 Red Book, Blue Book, White Book

TUP Q.721-Q.724 Red Book, Blue Book, White Book

ISUP Q.763/Q.764 Blue Book, White Book

SCCP Q.711- Q.714 Blue Book, White Book

MoU-ISUP Q.767 ETS 300 356-1

National Variants -

FTZ 1TR7 (ISUP, TF), 3.90x, 3.91x, 3.92x

FTZ 163TR8 (TUP+) ETSI/CEPT TUP+

FTZ 163TR73

FTZ 163TR75 (4/89, 3/93, 4/94, 4/95, 4/96, 4/97)

FTZ 163TR76

TUP Brazil (TELEBRAS TUP and

EWSD-BRA-V4.2 TUP)

TUP Italy (CSELT TUP-E, TUP-N)

TUP Finland

TUP France (France Telecom SSUTR for VN5)

TUP Great Britain (British Telecom national User Part BTNR167 and BTNR5167)

TUP Switzerland (Swissnet 1 TUP national)

TUP Uruguay

ISUP Holland (PTT NL NL1, NL2)

ISUP Israel

ISUP Colombia

ISUP Uruguay

ISUP Austria OEFEG SP

ISUP China

ISUP Poland

ISUP Portugal

ISUP Slovakia

ISUP Pakistan

ISUP Czech Republic

ISUP Hungary

ISUP GUS

ISUP/TUP Australia

ISUP/TUP Belgium

ISUP/TUP Spain

ISUP/TUP Denmark

MCI 075-0002-01.5R-ES (ISUP)

MCI 005-0004-07.5F-ER (ISUP)

MTP Uruguay

MTP/TUP China

MTP/ISUP Hong Kong

IGAP (Iridium Gateway Application Part)

ANSI MTP (ANSI T1.111 Layer 2 and 3)

ANSI SCCP (Bellcore T1.112)

ANSI ISUP (Bellcore T1.113)

ANSI TCAP (Bellcore T1.114)

TR-NWT-000246, issue 3, 1993

TR-TSY-000533, July 1987

IS-41B/IS-41C/IS-41D

Chinese INAP, Spanish INAP, French INAP, Austrian INAP, Italian INAP

INAP (TN70, TN80, TN90, TN100, ETS 300 374-1, ETS 300 356-18/4, ITU-T Q.1218, SINAP2-SINAP5, SINAP5M, INAP for Argentina (acc. Alcatel SESA 214 82811 AAAA DS 3/94), INAP 163 TR 78

Data User Part DUP-DFS

ITU-T Data User Part X.61

NMT 900 MUP/HUP

D-Channel Protocols-

Deutsche Bundespost 1TR3 (1TR6, issue 1.90 (12.91)). VN3 (ST/LAA/RSM/144). ETSI ISDN Layer 3 ETS 300 102-1 Dec. 90. ETSI ISDN Layer 3 ETS DE/SPS 5034-1, June 93. QSIG ISDN Layer 3 ETS 300 170, Feb. 93. CorNet-N Version 1.3c, Nov. 93. Blue Book Q.921, Blue Book Q.931.

X.25/LAPB

PHI (ETS 300 099, August 92)

DPNSS1, DASS2

V5.1 (ETS 300 324-1), V5.2 (ETS 300 347-1)

More CCS#7 user parts on request.

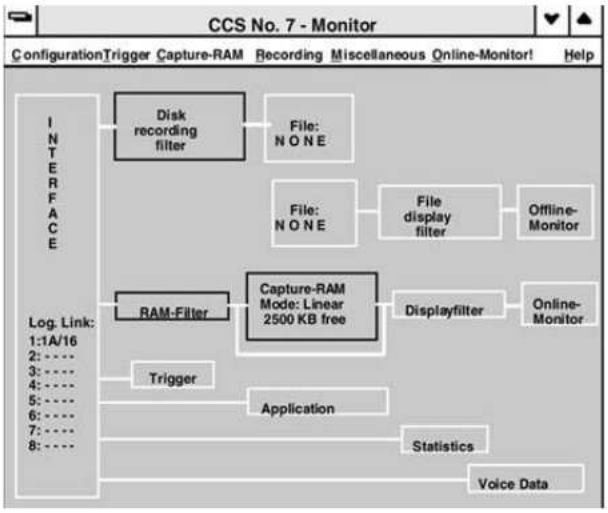
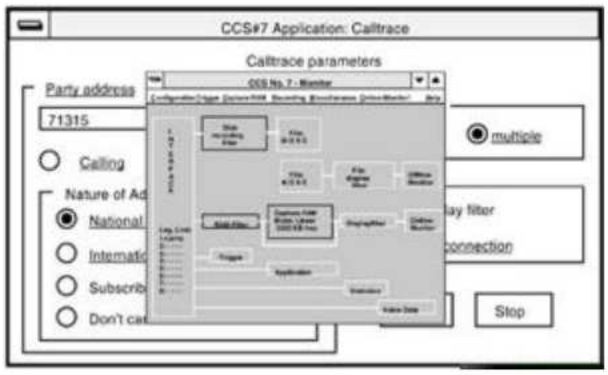


Fig. 5 Setting window for call tracing application

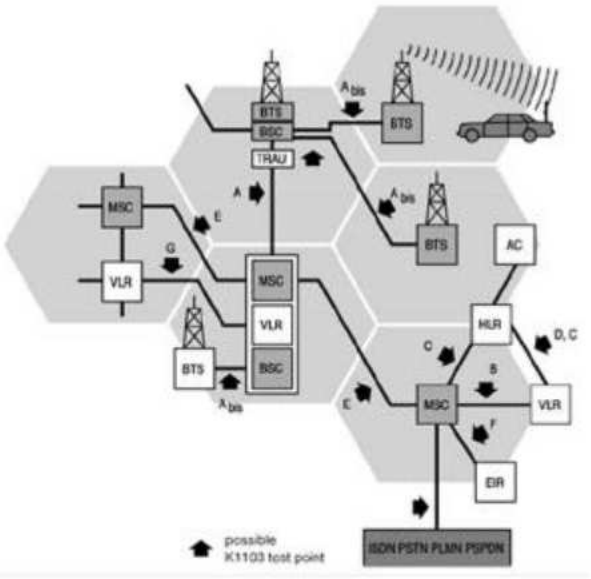


Software Supported Solutions for Numerous Practical Applications

- Call tracing using a/b directory number (Fig. 5)
- Traffic measurements, load distribution and telephone traffic
- Load distribution between two switching systems via a linkset
- Distribution of service features
- Evaluation of call attempts
- Distribution on STP or link-per-link signaling
- Measurement of switching times in the switching systems
- Change over and change back measurements
- Supervision of the availability of traffic channels, etc.
- Q752

Fig. 6 Architecture of the GSM

network.



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Product manufactured in ISO 9001 registered facilities

CE

2FW-11916-1p370, 06/1998, 09/01/1999

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Features
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CHARACTERISTICS

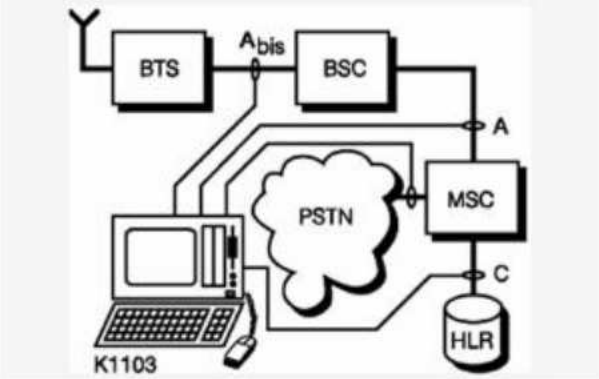
Description of Application Options for GSM

The Protocol Tester K1103 is designed for monitoring at the following PCM links (S_{2M}/T1) in the GSM:

Interface	Network Components	
A_{bis}	BSC	BTS
A	MSC/VLR	BSC
M	TCU	BSC
C/D	MSC/VLR	HLR/AC
E/G	MSC/VLR	MSC/VLR
B/C	MSC/VLR	PSTN

The location of the PCM links between the relevant GSM system components is shown in Fig. 6.

Fig. 7 Typical GSM analysis.



It is necessary to view several of these interfaces at the same point in time in order to assess the interoperation of the network components. One example is shown in Fig. 7 where the K1103 analyzes the signaling from the base station via the base station controller and the mobile switching center into the public telephone network. In parallel with this, a check is made as to whether the mobile telephone of the calling subscriber is entered in the HLR, i.e., whether the MSC executes this request. Another example for the use of the K1103 is to test handover procedures.

It is possible to test any combination of up to four PCM links with up to eight signaling links simultaneously.

Fig. 8 Complete decoding of layer 3 at the A_{bis} interface.

Except for the protocol of the A_{bis} interface (LAPD) the GSM protocols are based on CCS#7 signaling DTAP, BSSMAP, MAP, TCAP (see Fig. 8). The following table summarizes the implemented protocols for the interfaces, the protocol stacks as well as the standard and version references.

Table 1

Interface	Protocol	GSM/ITU-T
		Standard/Recommendation
A_{bis}	L2 LAPD	08.56
	RSL	08.58
	RSL for Siemens	
	RSL and O & M for Alcatel	
	GSM 12.21	
	Motorola Mobis	
	Ericsson O & M (R2-R6)	
	Nokia O & M	
	Siemens O & M	
	Lucent O & M	08.60
	16 kbit/s	
	frame analysis	08.60
A	DTAP	04.08
	BSSMAP	08.08
	SCCP	Q.711 to Q.714
	MTP	Q.701 to Q.704,
		Q.706 and Q.707
	Supplementary Services	04.80
	Short Messages	
	Control Protocol	04.11
	Short Messages	
	Relay Protocol	04.11
	Short Messages	
	Transfer Protocol	03.40
B/C/D/E/F/G	CAP	09.78
	MAP	09.02
	TCAP	Q.771 to Q.774
	SCCP	Q.711 to Q.714

	MTP	Q.701 to Q.704,
		Q.706 to Q.707
	ISUP/TUP	any

Table 1. Protocol stacks for the various GSM interfaces are available (GSM Phase 1, Phase 2, Phase 2+, PCS 1900 and CDMA). The protocols for GSM Phase 2 and Phase 2+ are for 900 MHz and 1800 MHz available.

For a number of tests on the A- and A_{bis}- interface, it is intended to provide special testing programs, e.g., to facilitate or automate:

- Call tracing (incl. handover)
- Mobile terminating call (MTC)
- Mobile originating call (MOC)
- Location update

The GSM software of the K1103 also provides the user with a statistics tool permitting monitoring analysis in accordance with ITU-T Recommendation Q.791.

Remote Control of the K1103 via ISDN, Modem (Carbon Copy) or Ethernet (PC-NFS)

As a further option, the K1103 can also be controlled via the ISDN, modem or Ethernet. The software provides the following features:
Remote control of the measuring software on the K1103

- from another K1103
- from a PC-compatible computer

File transfers between

- two Protocol Testers K1103
- a K1103 and a PC-compatible computer

Execution of DOS commands on a

- distant K1103
- distant PC-compatible computer

Technical Data

Hardware

Central processor	
	AT processor (80486 DX 33 MHz CPU) with 8-MB RAM
CPU module:	With DMA controller, timer, real-time clock with battery backup and interrupt processing
Connections:	2 serial interfaces
	(V.24, 9-contact D-subminiature connector)
	1 Parallel interface
	(Centronics, 25-contact D-subminiature connector)
	Video RGB-TTL (VGA)

Color display	
	9.4 in. TFT color display,
	256 colors, 25 MHz dot clock
Display matrix	640 x 480 dots
Visual area	192 mm x 144 mm
Display controller	VGA, 1-MB RAM
Keyboard	
	AT-type keyboard with 83 keys
Hard disk	
	540-MB hard disk with an average access time of about 15 ms
Floppy disk drive	
	3.5 in. floppy disk drive
Storage capacity:	
Normal	1 MB unformatted,
	720 kbyte formatted
High density (HD)	2 MB unformatted,
	1.44 MB formatted
Line status display	
	LEDs on the front to indicate the status or the activity of the individual interface lines
	LED to indicate power supply and hard disk activity

Software

Operating system	**MS-DOS 6.2 with operator guidance under MS-Windows 3.11.**
Testing of protocols	Preparation of all tools required for evaluative monitoring and interactive protocol testing
Autoconfiguration	Automatically seeks the signaling channels in the connected PCM links
Test run, statistics execution	With function keys or program; different filter conditions, trigger conditions and counters; execution and display of statistics and tests. Measuring software fully integrated in MS-Windows 3.11; data interchange with other Windows applications via clipboard. Operation with mouse support possible
Data acquisition	
Time stamping	Receive data with resolution of 10 ms, clear allocation of events in different channels
Protocol data acquisition buffer memory	2.5 MB
Control options	Start following trigger, pre/mid/post trigger
	Acquisition of all or filtered data
	Trigger and filter depth down to any detail of any defined message (e.g., the value of the sequence indicator or

	the number of the called subscriber)
	Stop if buffer full or overwrite in ring buffer operation
	Start/stop following trigger
Data recording	
	1 Erlang per data direction without performance restriction
	Time stamping, also with on-line display on floppy disk/hard disk
Control options	
	Store all or filtered data; same filter options as with data acquisition in the RAM buffer
	Start or stop following trigger (with header/trailer)
	Stop if floppy disk/hard disk is full
Data reproduction	
	Cyclic with read/hold
	Display of all or filtered data
	Change type of display
	Printout of a selected area
	Securing data on floppy disk/hard disk
	Display of the RAM or file content by scrolling up and down, jumping to beginning or end
	Direct positioning
	Search with search mask
	Positioning to instant
	Display of all messages for a connection on actuation of a key
Trigger actions	
	Switch-on message relay
	Switch-on/off data recording
	Increase statistics counter
	Activate further triggers
	Printout or display text message
	Select connection

General Data

Power Supply

Power Connection -
Protection class I (protective ground).

Line Voltage -
Rated range of use: 230 V -15 to +10 %, switchable to 115 V -15 to +10 %.

Line Frequency -
Rated range of use: 50 Hz ± 5 %, 60 Hz ± 5 %.
Limit range of operation: 47 to 63 Hz.

Power Consumption -
Approx. 250 W secondary power.

Safety Specifications -
As per DIN VDE 0411.

Environmental Conditions

Ambient Temperature -
Reference value: 23°C ± 1°C.
Rated range of use: +4°C to +40°C.
Limit range for storage and transport: - 40°C to +70°C at 85 % relative humidity.

Barometric Pressure, Altitude -
Reference value: 101.3 kPa (1013 mbar).
Rated range of use I: 70.0 to 106.0 kPa (up to 2200 m) (700 to 1060 mbar).
Limit range of operation: 53.3 to 106.0 kPa (up to 4300 m) (533 to 1060 mbar).

Radio Interference Suppression -
As per DIN VDE 0871 and Vfg. 1046/1984.

Interference Radiation and Interference Rejection -
CE designation as per 89/336 EU
(EN 55 022/B and EN 50 082-1).

Physical Characteristics

Dimensions	**mm**	**in.**
Height	200	7.9
Width	336	13.2
Depth	511	20.1
Weight	**kg**	**lbs.**
According to configuration	11 to 13	24 to 29

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Features
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Product manufactured in ISO 9001 registered facilities

CE

2FW-11916-1p370, 06/1998, 09/01/1999

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