

KMK 8

AC- and DC-fault location bridge



- Four instruments in one: Active Bridge, Passive Wheatstone Bridge, Graaf Fault Locator, TDR
- Extremely easy operation
- Automatic Test Sequences
- Remote controlled loop switch

DESCRIPTION

The Cable fault locator KMK 8 is a small, hand held instrument for the qualitative evaluation, fault location and quali-fication of existing telecommunication cables.

The KMK 8 calculates from the pre-programmed or the user specific entered cable parameters and the entered or measured cable temperature the cable lengths as well as the distance to the fault.

The KMK 8 consists of the measuring modules:

- The Reflectometer (TDR) for reflection measurements
- The active measuring bridge for high precision resistance and capacitance measurements as well as DC and AC location of faults on cables with low AC interference voltages levels. In connection with a active slave at the far end of the cable the active bridge allows fault location with the Graaf method.
- A passive Wheatstone bridge for resistance and capacitance measurements as well as DC and AC location of faults on cables with high AC interference voltages levels
- The Test Systems for Pre-measurement, Quick test and Quality testing
- The Voltage measuring module for the measurement of interference voltages in cable systems
- The warning and information system to inform the user continuously about disturbances like, for example interference voltages
- The remote control for the operation of the electronic far end loop control switch

Due to the graphical display, the easily operated menu and extensive help functions, the handling and operation of the KMK 8 is very easy.

The displayed test results can be stored in the internal memory as a PDF or Excel file to transferred via the USB interfaces to an USB Stick or directly to a PC.

Four instruments in one

- Active Bridge for accurate location of faults on cables with low interference voltages level
- Passive Wheatstone Bridge for location of faults on cables with high interference voltages level
- Graaf Fault Locator for accurate fault location on totally watersoaked cables with high and intermittent interference voltages
- Reflectometer (TDR) for the location of low impedance faults and cross talk between pairs

The hand-held Cable fault locator KMK 8 is used to test the quality of telecom cables and to locate cable faults.

The combined instrument provides several tools for the accurate location of DC and AC faults.

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Remote Controllable Far end Devices

KMK 8 has a function for the remote control of a far end loop closing device. This feature allows just one person to perform measurements, which require the operation of the far end loop (e.g. K upfm uller).

- KLC 8 loop closing device to open or close the far end of the tested cable
- KMK 80S slave unit to perform synchronous end to end Graaf measurements

Large Memory

The test results can be stored in the internal memory and transferred to a PC. It is possible to view the results directly in the display and to print them from there. Alternatively the data can be viewed as table and transferred to the PC as PDF file. The results can also be converted into Excel format.

Features

Easiest Operation

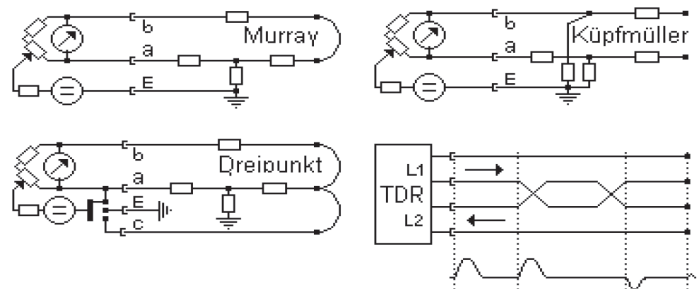
- Easy to use menu system
- Many-sided topic oriented help system
- Large Graphic Display with Backlight
- Pre-defined, automatic test sequences

Automatic Test Sequences

- Cable State Survey to find the best test method
- Quick Test of main parameters
- Quality Test Sequence

Optional accessories

- KMK 80S slave unit to perform synchronous end to end Graaf measurements
- KMK 8-Calibration Certificate
- KTS 8-PT 1000 Temperature sensor



Available Test Methods

Resistance Measurements

- Loop resistance
- Resistance difference
- Insulation resistance

Capacitance Measurements

- Cable capacitance
- Capacitive balance

DC Fault Location Methods

- Murray, 3 Point
- Repeated K upfm uller

AC Fault Location Methods

- Interruption
- Repeated K upfm uller

Graaf Fault Location Method

- End to end Master-Slave measurement
- Fault location on completely wet cables

TDR Measurements

- Single pair
- Double Pair Measurements
- XTALK
- Comparison to Memory

AC-DC Voltage measurements

Cable temperature measurement

USB Ports for Result Transfer

- USB B device-port for direct PC connection
- USB A host-port for USB stick (Indirect transfer).
The indirect data transfer is advantageous for users, which do not have administrative rights to install a driver to their PC.

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TECHNICAL DATA*

KMK 8

General specifications

Power supply	Internal rechargeable NiMH battery pack
Operating time	approx. 8 hours (without backlight)
Charging (without taking the battery pack out)	From 100 ... 240 V mains with mains adapter; from 12 V car battery with car adapter
Ladezeit max.	less than 3 hours (fast charging mode)
Display	320 x 240 dot graphic LCD

Connectors

Connector for mains adapter	2.1 / 5.5mm coax
L1 and L2 line connectors	4 mm banana sockets
Ground connector	4 mm banana socket
USB A	USB 1.1 host port for USB stick
USB B	USB 1.1 device port to connect PC

Over Voltage Protection (Ri >5 kΩ)

Between a and b or ground	500 V DC, 350 V AC
Longitudinal voltage	60 V AC

Ambient temperature ranges

Reference	23 ± 5 °C Rel. humidity 45 % ... 75 % *
Normal operation	0 ... +40 °C Rel. humidity 30 % ... 75 % *(< 25 g/m ³)
Limits of operation	-5 ... +45 °C Rel. humidity 5 % ... 95 % *(< 29 g/m ³)
Storage and transport	-40 ... +70 °C Rel. humidity 95 % at +45 °C *(< 35 g/m ³)
Memory for test results	50
Memory for cable parameter	50
Dimensions	224 x 160 x 75 mm
Weight (incl. battery pack)	ca. 1.8 kg

TDR

Measuring Ranges

For non loaded cable (at V/2=100)	16 m ... 32 km
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Evaluation of Results

With cursor and marker	in meters
Refreshing of waveform	~ 4/sec
Zoom	Maximum 16

Accuracy

Fault location	0.2 % of range
Resolution	0.01 m

Ausbreitungsgeschwindigkeit

For non loaded cables	V/2	45 ... 149 m/μs
	VOP	30 ... 99 %
For loaded cables	V/2	1.2 ... 30 m/μs
	VOP	0.8 ... 20 %

Pulse Characteristics

Widths for non loaded cable	4 ns ... 6 μs
Widths for loaded cable	330 μs
Amplitude	1.3 ... 12 V _{pp} into 120 Ω

Line Connection

Impedance	120 Ω balanced
Balance control	50 ... 270 Ω

Gain control

Range	0 ... 90 dB
Steps	6 dB/step

Distance Dependent Amplitude Correction

Stufen	10 steps
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Active Bridge

Voltage

DC voltage	up to 400 V
AC voltage	up to 250 V _{rms}
Accuracy	± 3 % ± 1 V
Frequency range	15 ... 300 Hz
Input resistance	2 MΩ

Loop Resistance

Measuring range	1 Ω ... 10 kΩ
Accuracy	± 0,3% ± 0.1 Ω

Resistance Difference

Loop resistance range	10 Ω ... 5000 Ω
Accuracy	± 0.2 % of R _s ± 0.2 Ω

Insulation Resistance

Measuring range	10 kΩ ... 300 MΩ
Measuring voltage	100 V
Accuracy	± 2 to 5 % ± 1 kΩ

Capacitance

Measuring range	10 nF ... 2 (10) μF
Measuring voltage	11 Hz, 100 V
Accuracy	± 2 % ± 0.2 nF

Capacitive Balance

Measuring range	10 nF ... 2000 nF
Measuring voltage	11 Hz, 100 V
Accuracy of Lx/L value	± 0.2 %

DC Fault Location

Test methods	Murray, Küpfmüller, 3 Point
Loop resistance range	1 Ω ... 10 kΩ
Fault resistance range	up to 100 MΩ
Measuring voltage	100 V
Accuracy	(R _I = 2 kΩ, L _x /L = 0.1 to 1)
Fault resistance	< 1 MΩ ± 0.2 %
	1 MΩ ... 5 MΩ ± 0.3 %
	5 MΩ ... 25 MΩ ± 0.5 %
	25 MΩ ... 100 MΩ ± 2 %

AC Fault Location Interruption

Measuring range	up to 20 km (depends on cable typ)
Accuracy	± 2 % ± 0.2 nF

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Passive Bridge

Loop resistance

Measuring range	1 Ω ... 10 kΩ
Accuracy	±0.3% ±0.3 Ω

Insulation resistance

Measuring modes	Quick measurement, Quality measurement
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Measuring ranges

Quick measurement	10 kΩ ... 300 MΩ
Quality measurement	up to 10 GΩ
Measuring voltage	100 V
Accuracy	10 kΩ ... 50 MΩ 5% ± 1 kΩ
	50 MΩ ... 100 MΩ 10%
	0,1 MΩ ... 5 GΩ 20%
	5 GΩ ... 10 GΩ 30%

Resistance difference

Loop resistance range	1 Ω ... 5,000 Ω
Accuracy	±0,2% des Rs ±0,2 Ω
Resolution of Lx/L (Mk) value	
In range ΔR < 10%	1/10,000
In range ΔR > 10%	1/1,000

DC fault location

Test methods	Murray, Küpfmüller, 3 point
Loop resistance range	1 Ω ... 10 kΩ
Fault resistance range	up to 100 MΩ
Measuring voltage	100 V
Accuracy	(Rs = 2 kΩ, Lx/L = 0.1 to 1)
Fault resistance	< 1 MΩ 0,2 %
	1 MΩ ... 5 MΩ 0,3 %
	5 MΩ ... 25 MΩ 0,5 %
	25 MΩ ... 100 MΩ 2 %
Resolution of Lx/L (Mk) value	1/1,000

AC fault location Küpfmüller method

Loop resistance range	1 Ω ... 10 kΩ
Fault resistance range	up to 25 MΩ
Measuring voltage	11 Hz, 100 V
Accuracy	(Rs = 2 kΩ, Lx/L = 0.1 ... 1)
Fault resistance	< 1 MΩ ± 0.3 %
	1 MΩ ... 5 MΩ ± 0.5 %
	5 MΩ ... 25 MΩ ± 1.0 %
Resolution of M value	1/1,000

AC capacitive balance

Measuring range	10 nF ... 2,000 nF
Accuracy of Lx/L value	±0.2 %
Measuring voltage	11 Hz, 100 V
Resolution of Lx/L value	
In range Lx/L = 0.9 ... 1.1	1/10,000
In range Lx/L < 0.9 or Lx/L > 1.1	1/1,000

Fault location Graaf method

Loop resistance range	10 Ω ... 10 kΩ
DC current range	5 μA to 1 A
Accuracy (I > 10 μA)	±0,3 % ... ± 2 %

Pre measurement

Interference Voltage

DC voltage	0 ... 400 V
AC voltage	0 ... 250 V _{rms}

Loop Resistance

Measuring range	1 Ω ... 10 kΩ
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Insulation Resistance

Measuring mode	Repeated measurement
Measuring time	~ 3 sec

DC Current

Measuring range	10 μA ... 1 A
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Temperature (with Pt 1000 temperature probe)

Measuring range	-20 °C ... +60 °C
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Automatic quick test Interference Voltage

Measuring range	up to 400 V DC, 250 V AC
Test results	Vab, VaE and VbE

Insulation

Measuring range	10 kΩ ... 300 MΩ
Measuring time	~ 3 x 15 sec.
Capacitance	10 ... 2,000 nF

Capacitive Balance

Measuring voltage	11 Hz, 100 V
Test result	Unbalance %

Automatic quality test

Insulation	10 kΩ ... 10,000 MΩ
Measuring time	~ 3 x 30 sec.
Capacitance	10 ... 2,000 nF

Loop Resistance

Measuring range	1 Ω ... 10 kΩ
Accuracy	±0,3% ±0,1 Ω

Resistance Difference

Loop resistance range	10 Ω ... 5 kΩ
Resolution	1/1,000

ORDERING INFORMATION

Product	Order no.
Cable test set KMK 8 inkl. accessories	11 830 5098-S
Option:	
Remote-controlled measuring contact for Graaf measurement	11 830 5622
Temperature sensor	11 830 5623
Vehicle battery connection cable	11 830 5659
Charger universal EU/UK/US	9 001 9966

* We reserve the right to make technical changes.

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