Measuring Instrument Programme 2009

KATHREIN
Antennen · Electronic

Contents

MSK 115

Satellite meter

MSK 115 21710020 $C\epsilon$

For optimal alignment of digital satellite systems in a handy, compact design.

Display of signal strength and quality allowing optimal alignment of the antenna. In addition, the device features spectrum and constellation measurement for further monitoring.

A default transponder and satellite list makes the meter easy to operate.

Users can also set and save transponders.

Software updates also allow the measuring instrument to be programmed for other client-specific satellite transponders.

The measuring instrument is easy to operate and consequently the ideal tool for antenna installers during the installation of satellite systems.

Features

- Measuring range: 950-2,150 MHz

- Input level range: 44-84 dBµV

- Input data rate: 1-45 MSymbol/s

- Level and BER measurement

- BER bar display either linear or logarithmic

- QPSK constellation diagram

- Display of the frequency spectrum with selectable span (60, 120, 240, 480, 960 and 1,200 MHz)

- Display of carrier-to-noise ratio (C/N)

- Display of optical signal quality and signal strength

- Acoustic signalling to facilitate antenna alignment

- Quick test for LNB current

- Level display: either in dBµV or linear in 256 steps

- 64 transponders/ 32 satellites can be set

- Transponder can be set by the user

- Satellite parameters can be easily adjusted or changed through software updates

- Measurement results can be saved to the device

- Measurement results can be transferred to a PC through a USB cable

- Supply voltage through built-in battery

- Battery capacity is sufficient for over three hours of continuous operation

- Battery charging via external 12 V DC supply

- LNB supply voltage: 14/18 V, max. 500 mA

- Control signal: DiSEqC™1.0, 22 kHz, SCR single-cable system control signals for ASTRA 19.2° and Hotbird 13.0°

- RF input: 75 Ω, F-type, with loop-through output

- USB interface for software updates and data transmission

- Includes carry case, RF cable with F-type plug, 230 V/12 V power supply unit, 12 V car power charger cable, USB connection cable, instruction manual with safety notes

- Dimensions W x H x D (mm): 205 x 68 x 137

- Weight: approx. 1.5 kg

■ Functional carry case with shoulder strap and compartment for accessories

■ Car power charger cable with 2 Amp fuse
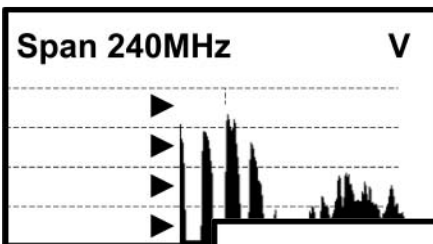
■ Measuring cable 2 x F-type plugs
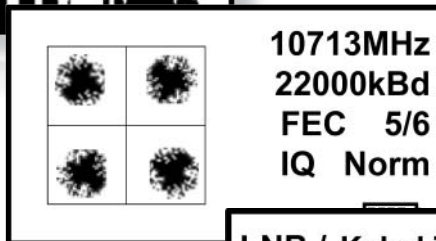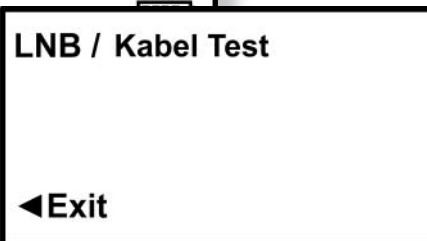
■ Power supply unit

■ USB cable

Measurement options

Span 240MHz   V

■ Spectrum mode

10713MHz
22000kBd
FEC   5/6
IQ   Norm

■ Constellation diagram

LNB / Kabel Test

◄Exit

■ LNB/Cable test

Type		MSK 115
Order no.		21710020
Frequency range	MHz	950-2,150
Impedance	Ω	75
Level range	dBµV	44-84
Input symbol rate	MSymb/s	1-45
LNB supply voltage	V	13-18
LNB operating current	mA	Max. 450
Ports		
Input/output	-/ Ω	F-type/75
USB port		Socket, type B
Power supply	mm	Hollow socket, 2.1/1.5
Battery power supply		
Integrated battery (6-cell NimH)	mAh	3,300
Battery voltage	V	12
External power supply unit		
Input voltage	V_{AC}	100-240
Output voltage	V_{DC}	12
Output current	A_{DC}	1.7
Operation modes		
Spectrum display		
Displayed bandwidth	MHz	60, 120, 240, 480, 960, 1,200
Frequency display	MHz	10,700-12,750
Signal level display		
Carrier level	dBµV	44-84
Measurement accuracy	dB	± 1.5
C/N display		
Signal-to-noise ratio	dB	Max. 20
Measurement accuracy	dB	± 1.5
MER/BER display		
MER	dB	Max. 20
Measurement accuracy	dB	± 1.5
BER		Min. 3,12 E-3
Measurement accuracy	ppm	500
Additional operation modes		
Constellation diagram		4 QPSK quadrants
Histographic representation		Carrier display in single-cable systems (up to 9 carriers)
General		
Temperature range operation/storage	°C	0 to +60/-20 to +85
Protection class (front panel)		IP 54
LC display (Dot matrix, with backlighting)	Pixels	128 x 64
Memory: Transponders/satellites/polarisations		64/32/H-V
DiSEqC™ commands (pre-stored): Sat-IF Single-cable systems		16 polarities Single-cable LNB, Single-cable matrix for 1 to 2 satellites (ASTRA or ASTRA/Hotbird)
Dimensions (W x H x D)	mm	205 x 68 x 137
Weight	kg	1.5

MSK 125

Signal meter Sat/TV/FM

MSK 125   21710022   CE

The MSK 125 has been designed as a portable multiple standard selective signal meter for analogue TV, Sat and FM Radio and for the digital standards DVB-C, DVB-S(2) and DVB-T/DVB-H.

The unit is equipped with a high-quality, transflective 5.7" TFT VGA resolution colour screen and a two-line, 22-digit LC display to show measured values.

The calibrated spectrum function features a sweep rate of approx. two seconds.

The built-in CI slot allows display of coded programmes [1].

The featured meter memory bank enables one to save up to 100 meter settings.

Up to 100 measurement results can also be saved on an SD card and then exported via the USB port onto a PC.

[1] Decoding requires use of a corresponding CAM and valid access card (not included in the delivery scope)

Features

- Level measurement of analogue and digital TV signals (TV, Sat, FM, DVB-S(2), DVB-C, DVB-T, DVB-H (2k and 8k mode)

- Video display of analogue and digital TV signals

- Measurement and display of BER/MER

- 5.7" TFT colour display, transflective (640 x 480 pixels)

- Two-line, 22-digit LC display

- Spectrum display

- Sat finder function

- Acoustic signalling to facilitate antenna alignment

- Level display in dBµV or in dBmV

- Automatic measurement range selection

- Direct frequency and channel entry

- Measurement and display of remote feed current drain

- Audio carrier measurement (TV)

- NICAM audio carrier and BER measurement

- Audio control with built-in loudspeakers

- Stereo headphone jack

- DiSEqC™1.0 control signal

- SCR single-cable system control signals (with software update in development)

- Memory for signal meter settings

- Measurement value memory (SD card), with data read out via USB

- Data logging

- Software update interface

- Bi-directional SCART socket (CVBS, audio)

- Mains or battery operation

Delivery scope

- Carry case for MSK 125 and accessories

- Carrying strap

- Plug-in power supply unit

- BNC test cable with adaptors

- USB cable

- SD card

Type		MSK 125
Order no.		21710022
RF section		
Frequency ranges	MHz	TV: 47 ... 862, Sat: 920 ... 2,150, FM: 87 ... 108
Frequency resolution	kHz	TV/FM: 50, Sat: 125
Transmission standards		B/G, I, D/K, M, N
DVB standards		DVB-S(2): QPSK, 8PSK DVB-C: 64 QAM, 128 QAM, 256 QAM, DOC 64 QAM (only MER and Offset) DVB-T/DVB-H: COFDM, 2k, 8k; QPSK, 16 QAM, 64 QAM
TV system standards		
Colour standards		PAL/NTSC in colour; SECAM in b/w
Audio		FM, NICAM and AM audio
Digital video decoding		MPEG-2
Level measurement section		
Level measurement range	dBµV	30 ... 120
Measurement accuracy	dB	< 2
Measurement bandwidths	MHz	TV/FM: 0.25; DVB-S/DVB-C/DVB-T, Sat analogue: 6
Detector analogue		TV: peak value; Sat/FM: mean value
Detector digital		Mean value
BER/MER/Carrier offset measurement		DVB-S(2)/DVB-C/DVB-T/DVB-H
Display		
Monitor		TFT colour display 5,7", 640 x 480 pixels, transflective
LC display		Alphanumeric 2 x 22 characters (131 x 22 pixels), bargraph, illuminated
Sat finder (acoustical)		Level-dependent tone
Power supply		
Li-Ion accumulator	V/Ah	11.1/6.45
Mains (plug-in power supply unit)	V/Hz/W	100-250/50-400/100
DC external	V	10.8-14.0
Remote feeding		
Remote feed voltage supply	V	0, 5 ... 20
Remote feed current	mA	Max. 600
Control signals	kHz	22, DiSEqC™1.0, Simple DiSEqC™, SCR single-cable system (with software update in development)
Connections		
RF input (impedance)	Ω	F-type coaxial socket with BNC adaptor (75)
AV input/output		SCART (CVBS, Audio)
Headphone socket	mm	Jack, 3.5
USB port		Socket, type 2; USB 2.0
Flash memory card		SD, max. 1 GByte
Serial interface		RS 232, Sub D, 9-pin
CI interface		PCMCIA
DC voltage supply 12 V		DC-XLR socket
General		
Safety standards		Protection class I (AC/DC power supply), VDE EN 61010
Dimensions (W × H × D)	mm	258 x 297 x 75 (100 with battery compartment)
Weight	kg	Approx. 3.8

MSK 200

Antenna signal meter system

Made in Germany — Qualität aus Deutschland

MSK 200/S2 (75 Ω)	21710024
MSK 200/S2 (50 Ω)	21710025

CE

The MSK 200/S2 is a compact signal meter for the inspection of antenna and cable systems or even professional headend systems, which leaves nothing to be desired.

It can be used either in a lab or for the monitoring of remote-controlled headend systems as well as for final measurements on antenna and distribution systems.

Features

- Manageable portable signal meter

- High-resolution 10.4" TFT colour display to graph analogue and digital TV signals and graphics

- Backlight - thus the display is excellently readable even in bright sunlight (typ. 600 cd/m^2)

- User-friendly with 12 hard keys and an infra-red touch screen

- The touch-screen control panels can be adapted to the needs of left and right handers

- Alphanumeric touch-screen keyboard to enter numbers and text

- Shoulder strap that can be adapted in length

MSK 200/S2, Order no. 21710024

- 75 Ω BNC socket as test socket

MSK 200/S2, Order no. 21710025

- 50 Ω N-type socket as test socket

Functions

- MER measurement for all digital modulation types

- BER measurement

- Spectrum analyser with individually selectable start and stop frequencies, centre-frequency entry and span

- Simultaneous representation of spectrum and picture

- Memory oscilloscope

- Constellation analyser for all DVB standards

- MPEG and analogue TV screen

- Demodulation of analogue signals: AM (CATV, terr.), FM (satellite, radio)

Functions

- Demodulation of digital signals: DVB-C, DVB-T, DVB-S(2)

- Demodulation of the digital USA standards (J83B, DOCSIS, ATSC)

- Possibility to measure the video amplitude with line selection, S/N weighting and hum measurement

- S/N weighting: typ. 57 dB

- Channel selection in DVB-C, DVB-S, DVB-T and analogue through frequency entry, channel entry and user lists

- Remote-controlled via Ethernet, RS 232 and PCMCIA module [1]

[1] When used with MZS 200 remote control software (not included in the scope of delivery)

- Integrated user interface for data processing and office tasks

- Representation of SID, PMT-PID, PCR-PID, CA-Info, elementary current PID, service type (NIT in development)

- Data logging

- Return path measurements

- The results of the memory oscilloscope and the numerical value are shown in large format

- Measures: dBµV, dBm

■ Spectrum analyser
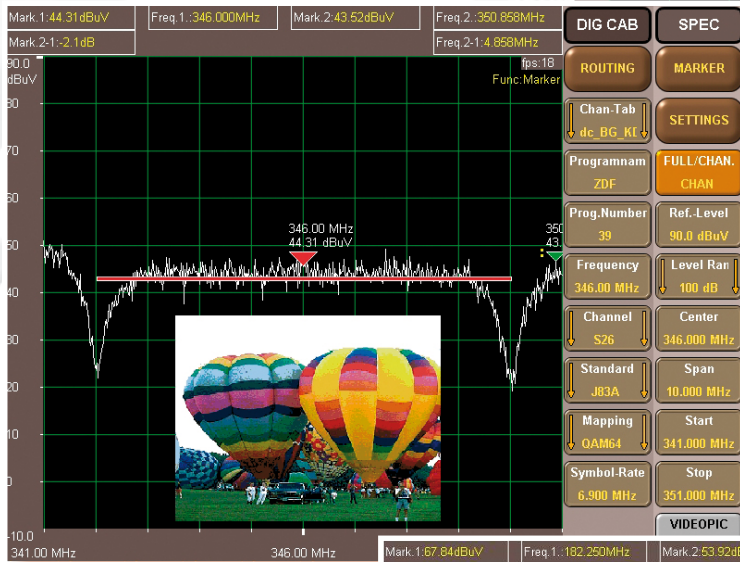
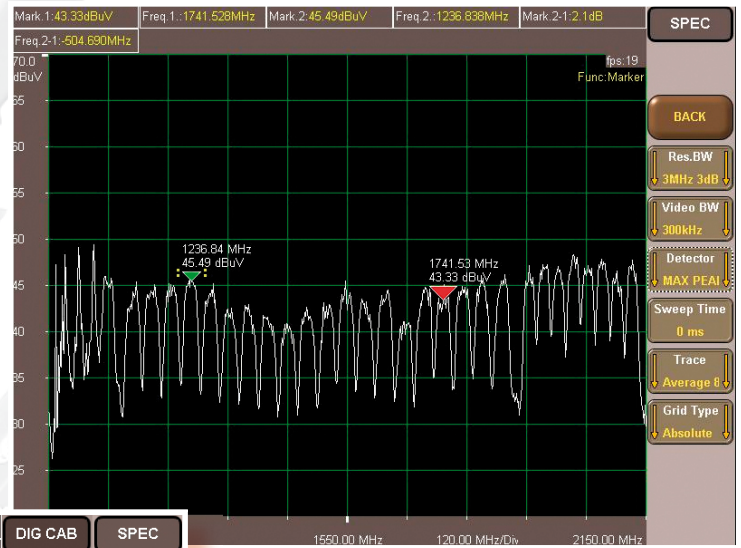■ Memory oscilloscope

■ Constellation analyser

■ MPEG monitor
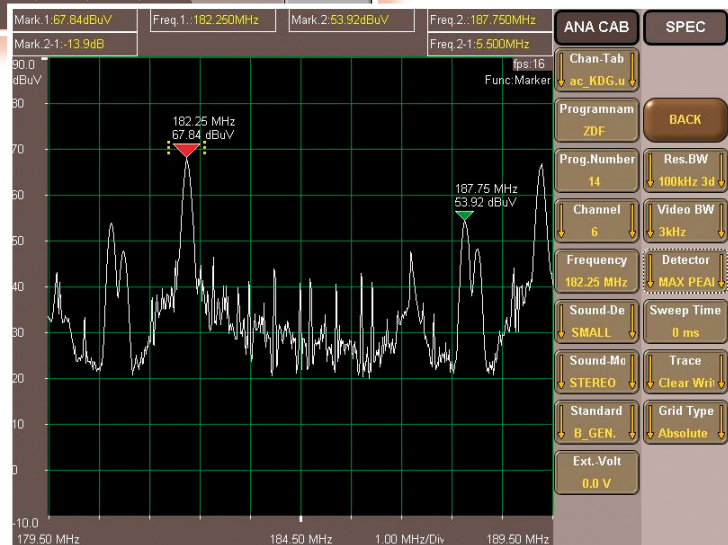
■ DiSEqC™ monitor

■ Multimeter for LNB

Spectrum analyser

■ Scan over the entire digital satellite band
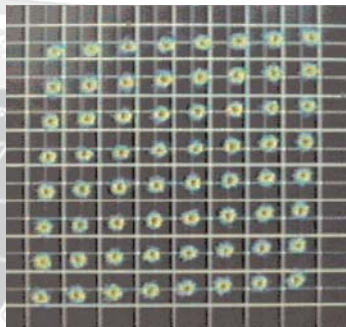

■ Digital cable channel with picture display

■ Analogue cable channel
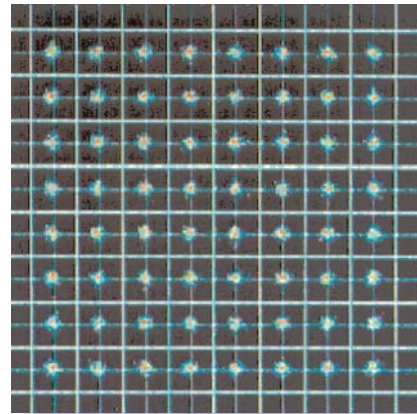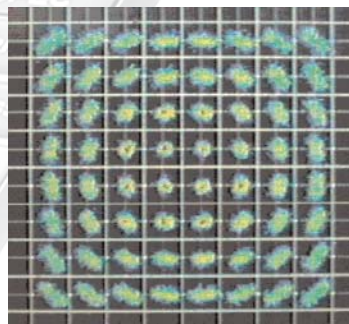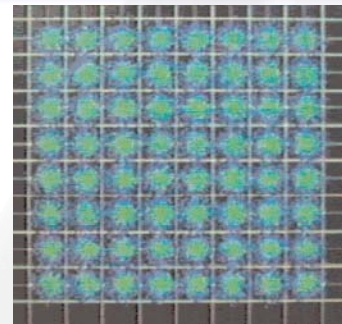
64 QAM signals

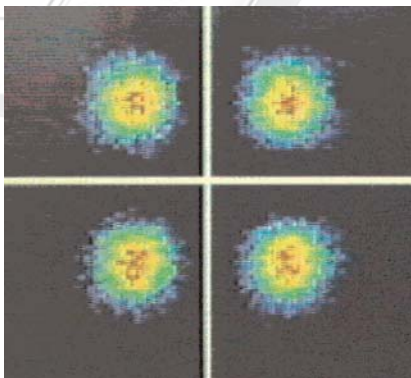- 64 QAM signal with no error

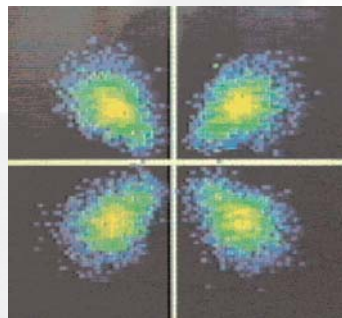- 64 QAM signal with low broadband noise

- 64 QAM signal with phase noise

- 64 QAM signal with high broadband noise
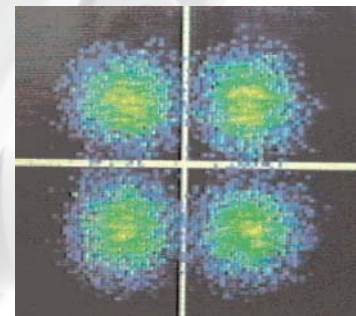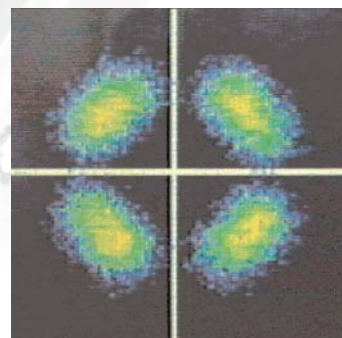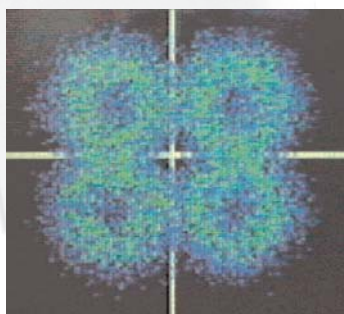
QPSK signals

- QPSK signal with amplitude modulation noise

- QPSK signal with super-imposed broadband noise

- QPSK signal with no error

- QPSK signal with intermodulation noise

- QPSK signal with phase noise

Type		MSK 200/S2	MSK 200/S2
Order no.		21710024	21710025
Input impedance	Ω	75	50
Spectrum analyser			
Frequency range	MHz	5-3,100	
Resolution bandwidth (-3 dB)	MHz	0.001-10	
Resolution bandwidth (-6 dB)	kHz	9, 25, 50, 120, 200	
Video bandwidths	MHz	0.00001-3	
Phase noise at 10 kHz carrier level spacing	dBc	< -90 (1 Hz), Typ. -95 (1 Hz)	
Phase noise at 100 kHz carrier level spacing	dBc	< -100 (1 dB), Typ. -110 (1 Hz)	
Dynamic (RBW: 100 kHz)	dB	Typ. 70	
Level measurement range	dBµV	20-130	
Accuracy of measurements	dB	< 1.5	
Measurement detector	dB	Max Peak, min peak, auto peak, sample, RMS	
Return loss (pre-attenuation 5 dB)	dB	> 16 (VSWR: 1.35)	
Repetition speed	Pic./s	Max. 10	
Reference level	dBµV	30-130	
Range of indication	dB	100, 70, 50, 30, 20, 10	
Screen resolution	Pixel	Max. 800 x 600/nominal 501 x 401	
Analogue TV receiver			
Standards		B/G, I, D/K, L/L´, M/N	
Colour standards		PAL, SECAM, NTSC	
Sound standards		IRT-A2, NICAM, BTSC, EIA-J	
Frequency increment	kHz	50	
Video-IF bandwidth		Standard-dependent	
Audio-IF bandwidth		Standard-dependent	
Video output voltage/impedance	V_{ss}/Ω	1/75 ± 1 dB	
Hum measurement	dB	> 50	
S/N weighting (to CCIR Rec. 567)	dB	> 55/Typ. 57	
Analogue satellite receiver			
Standard		FM to CCIR Rec. 405	
Colour standards		PAL, SECAM, NTSC	
Sound standards	µs	De-emphasis: 50/Panda-Wegener: 75	
Frequency increment	kHz	200	
Video IF bandwidth	MHz	27/36	
Audio IF bandwidth	kHz	130/380	
Video output voltage/impedance	V_{ss}/Ω	1/75 ± 3 dB	
Hum measurement	dB	> 50	
S/N weighting (to CCIR Rec. 567)	dB	> 55/Typ. 60	
Analogue input			
S/N weighting (to CCIR Rec. 567)	dB	Typ. up to 80	

Type		MSK 200/S2	MSK 200/S2
Order no.		21710024	21710025
Input impedance	Ω	75	50
Digital CATV receiver (J83 A, B, C)			
Modulation type		16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM	
Symbol frequency	MHz	2.0-6.999	
Frequency increment	kHz	50	
Video output voltage/impedance	V_{ss}/Ω	1/75 ± 1 dB	
IF bandwidths	MHz	1, 5, 6, 7, 8, 12	
MER measurement	dB	> 35/Typ. 38	
Digital terrestrial TV receiver (DVB-T, ATSC)			
Modulation type		QPSK, 16 QAM, 64 QAM, 8 VSB	
Symbol frequency		Standard-dependent	
Frequency increment	kHz	50	
Video output voltage/impedance	V_{ss}/Ω	1/75 ± 1 dB	
IF bandwidths	MHz	1, 5, 6, 7, 8, 12	
MER measurement	dB	> 35	
Digital satellite receiver DVB-S(2)			
Modulation type		QPSK, 8PSK	
Symbol frequency	MHz	2-45.0	
Frequency increment	kHz	200	
IF bandwidths	MHz	8, 18, 27, 36, 54	
Video output voltage/impedance	V_{ss}/Ω	1/75 ± 1 dB	
MER measurement	dB	> 14	
Constellation analysis			
DVB-C		16 QAM, 32 QAM, 64 QAM, 128 QAM, 256 QAM	
DVB-T		QPSK, 16 QAM, 64 QAM	
DVB-S(2)		QPSK, 8PSK	
ATSC		8 VSB	
Memory oscilloscope			
Resolution	Bit	12	
Sampling rate	MHz	54	
Memory depth	Picture	1	
Remote feeding			
Switching voltage/max. current	V/mA	5-20/600	
Control signals	kHz	22, Tone Burst, DiSEqC™2.0, SCR single-cable system and UFO®*micro* control signals	
Power supply			
Mains (power supply unit)	V/Hz/W	100-250/50-400/100	
Li-Ion accumulator	V/Ah	11.1/6.45	
DC external	V	10.8-14.0	

Technical data

Type		MSK 200/S2	MSK 200/S2
Order no.		21710024	21710025
Input impedance	Ω	75	50
Connections			
RF input standard (impedance)	Ω	1.6/5.6 (75) Adaptor pre-mounted on BNC	N-type socket (50)
Composite colour picture input/output, RGB output		Scart socket	
Video input/output		2 x BNC socket	
Transport current input/output		2 x Sub D socket (25-pin)	
ASI input/output		2 x BNC socket	
Common Interface/card reader		1/1	
PCMCIA slot		1	
Interconnection		1 x Ethernet	
USB port		2	
External keyboard		PS-2	
External mouse		USB	
Headphone connection	mm	Phone jack, 3.5	
Modem interface		RS 232/Mini DIN, 9-pin (socket)	
DC supply 12 V		XLR socket	
General			
Screen		10.4", TFT, 800 x 600 pixels with backlight	
Touch screen		Infrared	
Temperature range	°C	+5 to +45	
Dimensions (W x H x D)	mm	374 x 294 x 124	
Weight	kg	Approx. 8	

Delivery scope

- Carry case for MSK 200 and accessories

- Power cable

- AC/DC power supply unit with DC cable and XLR plug

- Fuse insert with fuse (for isolation of the built-in Li-Ion accumulator)

- Adaptors (only 75 Ω version):

  1.6/5.6 m - BNC (socket)
  BNC (socket) - F-type (socket)
  BNC (socket) - F-type (plug)
  BNC (socket) - IEC (socket)
  BNC (socket) - IEC (plug)

- Carrying strap

- Safety instructions, concise operating manual

Measurement amplifier $C \epsilon$

MZV 10   21710011

- Pluggable pre-amplifier/filter for MSK 200 (75 Ω version)

- Amplifier to increase the level in case of a weak DVB-T signal or to suppress the VHF range

- MZV 10 is pre-connected to MSK 200

- Frequency range: 109 MHz-1 GHz

- Gain: 19 dB

- Accuracy: ± 1 dB

- Noise figure: < 3 dB

- Suppression loss: 87 MHz/30 dB 95 MHz/20 dB

- Supply voltage: 10-20 V via RF output

- Connections: BNC connector/socket

- Impedance: 75 Ω

- Current drain: 120-60 mA

- Packing unit/weight (pc./kg): 1/0.2

Measurement amplifier $C \epsilon$

MZV 50   21710019

- Pluggable pre-amplifier/filter for MSK 200 (50 Ω version)

- Amplifier to increase the level in case of a weak DVB-T signal or to suppress the VHF range

- MZV 50 is pre-connected to MSK 200

- Frequency range: 109 MHz-1 GHz

- Gain: 19 dB

- Accuracy: ± 1 dB

- Noise figure: < 3 dB

- Suppression loss: 87 MHz/30 dB 95 MHz/20 dB

- Supply voltage: 10-20 V via RF output

- Connections: 50 Ω N-type connector male/female

- Impedance: 50 Ω

- Current drain: 120-60 mA

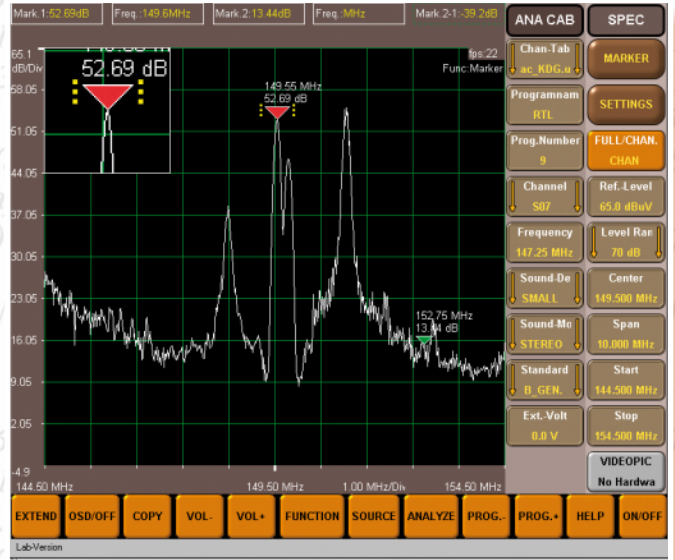- Packing unit/weight (pc./kg): 1/0.2

Remote control software

MZS 200   21710021

The software enables remote control of the MSK 200, allowing one to manage measurement procedures and effect measurement logging with a PC or laptop.

The signal meter can be connected to a PC or laptop via network connection.

- Measurement and logging of analogue and digital signals in the 5-3,100 MHz frequency range

- Access to all MSK 200 measurement functions

- Direct compilation of measurement logs on a PC

- Ethernet connection between MSK 200 and PC or laptop:

  - Can be integrated into existing networks (e.g. for remote monitoring of distant headends)

  - Direct connection via Ethernet cable is possible (e.g. MSK 200 applied in the lab or workshop)

- System requirements:

  - Windows 2000, Windows XP

  - At least 128 MB free hard disk memory

  - Ethernet connection

MVG 10

Video generator

MVG 10   208320   CE

The MVG 10 is a signal generator used to wobble and modulate video signals.
The operability of a cable network can be tested in both the forward path (47-862 MHz) and return path (4-80 MHz) before the system is put into operation.

The MVG 10 can also be connected to an already functional cable network.

The generator can wobble in various ranges, omitting frequency ranges which are already occupied, thus avoiding signal disturbance.

With the functions "Signal generator", "Noise generator" and "Sweep generator", the MVG 10 also serves for the maintenance work of radio and TV technicians.

This multi-purpose device with its many functions can also be used in laboratories.

Type		MVG 10
Order no.		208320
Frequency range	MHz	4-1,000
Frequency setting	kHz	50
Frequency resolution	kHz	62.5
Display		LCD alphanumeric, 2 x 16-digit, bargraph illuminated
Signal generator		Direct frequency entry; ± buttons; modulatable
Sweep generator		10 ranges with start/stop and frequency step entry
Channel-hopping generator		10 ranges with start/stop and channel step entry
Noise generator	MHz	4-1,000 (ripple: ± 2 dB)
Output level	dBµV	36-100; noise generator: 29-93 (7 MHz)
Level accuracy	dB	± 2
Level resolution	dB	0.1; noise generator: 1
Interference level	dBµV	< 40 (up to 90 dBµV output level)
Standards		B/G; D/K; I; M; Mj; H
Colour standards		PAL; NTSC
TV modulation		Internal: test picture/coloured bar; external: comp. colour, RGB (black/white) - double side band 4.5/5.5/6.0/6.5 MHz FM audio carrier modulation
FM modulation	kHz	Internal: NF = 1, deviation approx. 75; external: NF = 0.05-15
Power supply	V/Ah	Internal: lead battery 12/2.8; external: power supply unit 230/12
Connections		
Voltage supply	mm	Hollow plug, 5.5/2.1
Signal output	-/Ω	BNC socket/75
Signal input (comp. colour in, RGB in, audio in)		Scart socket
Data interface (software updates)		RS 232, Sub D, 9-pin
General		
Ambient temperature range	°C	Max. 0 to +40
Dimensions (W x H x D)	mm	90 (115) x 162 x 235 (incl. leather case)
Weight	kg	Approx. 3 (incl. leather case)
Delivery scope		Leather case with strap, power supply unit

Addresses

Head office

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83004 Rosenheim
Germany

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Fax: +49 (0) 8031 184-306

e-mail:
Business unit SAT - sat@kathrein.de
Business unit HFC - catv@kathrein.de

Internet:
www.kathrein.de

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Bahnhofstraße 108
83224 Grassau
Germany

Hotline:
Tel.: +49 (0) 8641 9545-0
Fax: +49 (0) 8641 9545-35 or 9545-36

e-mail: service@esc-kathrein.de
Internet: www.esc-kathrein.de

Direct accesses:	
Spare part orders/repairs	-15
Exports	-21
Reception systems/HFC	-45
Signal meters	-25
Receivers	-40
Car radio antennas	-15

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