KWS AMA 310

Some of the improvements oft the new unit are a faster processor, more userfriendly interface, better display resolution as well as copy and storage functions. The new housing concept permits better integration of modules, higher power capacity. Special attention in its design was drawn on electromagnetic compliance.

ANTENNA MEASUREMENT RECEIVER

- 5,5“ colour TFT display (640 x 480 pixel)
- Frequency range from 5-2,150 MHz
- Level measurement with picture/sound reproduction for analog signals: FM, TV and SAT
- Level measurement, Bit Error Rate, MER and MPEG-2-picture display, 2x Common Interface (CI) for DVB-C, DVB-T and DVB-S
- Spectrum display for all ranges;
- Constellation diagram in realtime for all digital norms
- Return channel measurement
- EURO /US-DOCSIS measurement in downstream
- TV stereo and dual channel indication
- Printer for measurement values
- Interface: Ethernet (RJ45), USB-A, USB-B, SCART
- Leather case with carrying strip
- Possible options: S/N measurement module with Hum; DVB-S2 front end; MPEG 2/4 combi decoder with ASI in/out and DVI-out; Docsis analyzer

FREQUENCY RANGE	
SAT	910-2150 MHz – Res. 500 kHz – ZF/ Transponder Frequency Input
TV	44.75-867.25 MHz – Res. 50 kHz – Frequency/ Channel Input
FM (UKW)	87.4-108.2 MHz – Res. 50 kHz
Rückkanal / Return path	5-65 MHz – Res. 50 kHz

RF INPUT

IEC socket: 75 Ohm (DIN 45 325)
return loss:
>12dB (5-867.25 MHz) – >10dB (910-2150 MHz)

USER INTERFACE

Input–lighted (10-Key Board)
Display–5.5“ TFT, VGA-Resolution (640 x 480 px)
Display–LC-Display–Parameter (320x64px)
Manual :
German / English / French
Audio –build-in speaker,
headphone jack

INPUT ATTENUATOR

0–60 dB in 2 dB steps

LEVEL RANGE

Mesurement ranges

SAT	30-120 dBµV
TV	20-120 dBµV
FM	20-120 dBµV
RK	25-120 dBµV

Resolution 0.1 dB – Accuracy +/- 1.5 dB (at 20°C) – +/- 2.0 dB (0-40°C)

ANALYZER

Measurement BW (RBW (-3dB))
SAT

Docsis-Analyzer (Physical Layer acc. ETSI ES 201 488-2)

Downstream-Demodulator:
US-DOCIS – acc. J83B, EURO-DOCSIS – DVB-C
Upstream-Modulator: Modulation Scheme – QPSK, 16QAM
Symbolrates – 160, 320, 640, 1280, 2560 kSym/s
Output Level – maximal 114dBµV
Continous Ranging (Synchronisation with CMTS)
Permanente Auswertung von Downstream/Upstream-Pegel /
Permanent Analysis of DS/US level
Search mode

DVB-T

COFDM-Demodulator (acc. ETS 300744), FFT – 2k, 8k
Modulation Scheme–
QPSK, 16QAM, 64 QAM
Guard-Intervall–1/4, 1/8, 1/16, 1/32
Measurement Parameter (acc. ETR290)
CBER (before Viterbi):- 1.00e-8

VBER (after Viterbi): - 1.00e-8
MER – up to 35 dB – Res. 0.1 dB – Acc. +/-1.5 dB
Impuls response:
Relative attenuation to main impuls: 0-30 dB
Search mode

CONSTELLATION DIAGRAM

I/Q-Analysis –digital carriers
Sources – DVB-S, DVB-S2, DVB-C, J83B, DVB-T
Repeating in real time
Display 3. in colors acc. frequency of status
Zoom-Function – for all four quadrants
Stop Function – Freezing of diagramm

TV	8 MHz, 4 MHz, 1 MHz
TV FM	4 MHz, 1 MHz, 200 kHz, 90 kHz
RK	200 kHz, 90 kHz
Span	200 kHz, 90 kHz
SAT	
SAT TV	Total Range, 600 MHz, 150 MHz, 75 MHz
	Total Range, 300 MHz , 100 MHz, 60 MHz, 30 MHz
FM	
Return path	Total Range, 6 MHz, 3 MHz
Max-Hold-Function –only return path Direct Switching from analyzer to receiver mode	Total Range, 30 MHz

Max-Hold-Function – only return path
Direct Switching from analyzer to receiver mode
SAT analog

Video: Bandwidth - 5 MHz
Deemphase acc. CCIR 405-1
Inverting for C-Band
Audio: Sound subcarriers 5-9.75 MHz
Search mode

DVB-S

QPSK-Demodulator (acc. ETS 300421)
Symbol Rates: 2-45 MSym/s

Mesurement parameters (acc. ETR 290)
CBER (before Viterbi): - 1.00e-8
VBER (after Viterbi): - 1.00e-8
MER – up to 20 dB – Res. 0.1 dB – Accuracy +/-1.5 dB
PE (Packet Errors) –Packet Errors after starting of measurement
Automatic Recognition DVB-S/DVB-S2
Search mode

Mesurement parameters (acc. ETR 290)
CBER (before Viterbi): - 1.00e-8
VBER (after Viterbi): - 1.00e-8
MER – up to 20 dB – Res. 0.1 dB – Accuracy +/-1.5 dB
PE (Packet Errors) –Packet Errors after starting of measurement
Automatic Recognition DVB-S/DVB-S2
Search mode
DVB-S2

QPSK/8PSK-Demodulator (acc. ETS 302307):
16APSK, 32APSK –not supported
FEC 1/4, 1/3, 2/5 –not supported
Symbol rates:
10–30 MSym/s - (2-45MSym/s - Firmware V01.xxx)

QPSK/8PSK-Demodulator (acc. ETS 302307):
16APSK, 32APSK –not supported
FEC 1/4, 1/3, 2/5 –not supported
Symbol rates:
10–30 MSym/s - (2-45MSym/s - Firmware V01.xxx)
Mesurement Parameter (acc. ETR 290)
CBER (before LDPC):-1.00e-8, LBER (after LDPC): -

Display of Single Carrier–only DVB-T

FM (UKW)

MONO/STEREO-Indicator
RDS (Radio Data System) –Sender Name, Dynamic Radiotext
Search Mode

RETURN PATH

Max-Hold-Funktion

MPEG 2-DECODER

Video-Decoding:MPEG-2 MP @ HL – ISO/IEC 13818-2
Audio-Decoding:MPEG-2 Layer I/II – ISOIEC 13818-3

MPEG 4-DECODER

Video-Decoding:
MPEG-2 MP @ HL – ISO/IEC 13818-2,
MPEG-4 AVC – ISO/IEC 14496-10
ITU-T H.264
Audio-Decoding:
MPEG-2 Layer I/II – ISOIEC 13818-3
MPEG-2 AAC – ISOIEC 13818-7
MPEG-4 AAC – ISOIEC 14496-3
DolbyDigital AC-3

COMMON INTERFACE (CI)

2 PCMCIA Slots - 2 CA-Modules:
Modules acc. EN50221
Exchanging CA modules on upper side of unit

ASI (ONLY WITH MPEG-DECODER)

Input: Input level – 500-880 mVss
Connector –BNC socket
Input impedance – 75 Ohm
Output: Output level – typ. 800 mVss
Connector –BNC socket
Output impedance – 75 Ohm

DVI (ONLY WITH MPEG 4-DECODER)

Digital Video output for DVI/HDMI:
Quelle – DVB
Output impedance – 100 Ohm
Diff. output level– typ. 1 Vss

1.00e-8
MER–up to 20 dB–Res. 0.1 dB–Acc. +/-1.5 dB
PE (Packet Errors) – counts PE after start of measurement
Automatic Recognition DVB-S/DVB-S2
Search mode

Mesurement Parameter (acc. ETR 290)
CBER (before LDPC):-1.00e-8, LBER (after LDPC): -1.00e-8
MER–up to 20 dB–Res. 0.1 dB–Acc. +/-1.5 dB
PE (Packet Errors)–counts PE after start of measurement
Automatic Recognition DVB-S/DVB-S2
Search mode
TV analog

TV standards – B/G, D/K, L, I, M/N
Colour standards - PAL, NTSC, SECAM
Audio demodulator:
Audio carrier 1 & 2:
Decoding mono, stereo, dual tone
Audio carrier measurment.
Audio carrier 1 & 2 relative to video carrier in dB:
Res. 0.1 dB – Acc. +/-1.5 dB
Search mode

TV standards – B/G, D/K, L, I, M/N
Colour standards - PAL, NTSC, SECAM
Audio demodulator:
Audio carrier 1 & 2:
Decoding mono, stereo, dual tone
Audio carrier measurment.
Audio carrier 1 & 2 relative to video carrier in dB:
Res. 0.1 dB – Acc. +/-1.5 dB
Search mode
Videotext (acc. DIN 45060)

Sources – SATanalog, TV analog, SCART, Zooming function

SNR MEASUREMENT

Measurement of analog video signals acc. CCIR 569
Sources – SAT analog, TV analog, SCART
Range – 40-55 dB (SAT,TV) – 40-60 dB (SCART)
Res. 0.1 dB – Acc. +/- 1.5 dB

Measurement of analog video signals acc. CCIR 569
Sources – SAT analog, TV analog, SCART
Range – 40-55 dB (SAT,TV) – 40-60 dB (SCART)
Res. 0.1 dB – Acc. +/- 1.5 dB
SCOPE

Sources – SATanalog, TV analog, SCART
Line selection – 1-625 bzw. 1-525 (NTSC)
Zoom Function – 1H, 1/2H, 1/4H, 1/8H
Pre/Post Trigger – +/- 1/2H
Display of low frequent AM interference

Sources – SATanalog, TV analog, SCART
Line selection – 1-625 bzw. 1-525 (NTSC)
Zoom Function – 1H, 1/2H, 1/4H, 1/8H
Pre/Post Trigger – +/- 1/2H
Display of low frequent AM interference
Nicam-Decoder (acc. ETS 300163)

Audio Carrier–5.85 MHz (B/G, D/K, L) bzw. 6.552 MHz
Decoding of mono, stereo and dual tone transmission
Measurement Parameter – BER: -1.00e-5

DVB-C

QAM-Demodulator (acc. ETS 300163)
Symbol Rates – 0.5-7.2 MSym/s
Modulation Scheme – 16, 32, 64, 128, 256 QAM

Measurement Parameter (acc. ETR290)
BER : - 1.00e-8
MER: up to 40 dB – Res. 0.1 dB – Acc +/-1.5dB
Search mode

J83B

QAM-Demodulator (acc. ITU-T J83B)

SCART

FBAS Input– Input Impedance 75 Ohm (typ. 1 Vss)
FBAS Output – 1 Vss an 75 Ohm
RGB Input – Input Impedance 75 Ohm (typ. 700 mVss)
RGB Output – 700 mVss - 75 Ohm (Videotext)
Audio Input L/R – Input Impedance 600 Ohm (typ. 1Vss)
Audio Output L/R–1 Vss - 600 Ohm

USB

USB-A–V1.1 (Full Speed)
USB-B–V1.1 (Full Speed)

ETHERNET

RJ-45–10Base-T (10MBit/s)

CPU

32Bit RISC Architecture
RTOS (Real Time Operating System)
FAT32 Filesystem
64 MByte FLASH-Disk
Software Update-USB-Stick

MEMORY

Memory for 200 savings – Memory display & protection

PRINTER

Thermo Printer – Horizontal Resolution: 384 Pixel

REMOTE POWERING

Voltage–5-20 V
Current – up to 500 mA
22 kHz Modulation (only SAT) – 0.8 Vss
DiSEqC (only SAT) – V1.0, V1.1, V1.2, V2.0,
Res. 1 mA – Acc. +/- 2% of final value
Automatic switch-off

OPTICAL RECEIVER (OPTION)

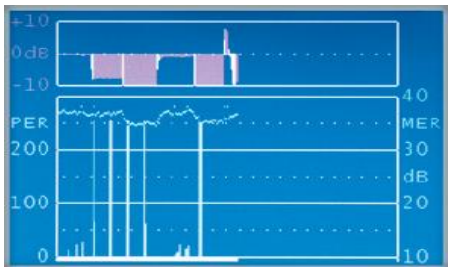
Connector: SC/APC
Wave Length (Lambda): 1260–1620nm
Opt. input level: +8dBm
Return path loss: > 40dB
Input noise (EIN): < 8pA/√Hz
RF Frequency range: 5–2150MHz
Input power: -7...+3dBm
Measurement parameters
Optical power: -35dBm...+9dBm
Wave Length: 1310nm, 1490nm, 1550nm
Resolution: 0,1dB
Accuracy: ± 0,35 dB
Resolution: 0,1%
Accuracy: ± 10%

SCHUTZMASSNAHMEN

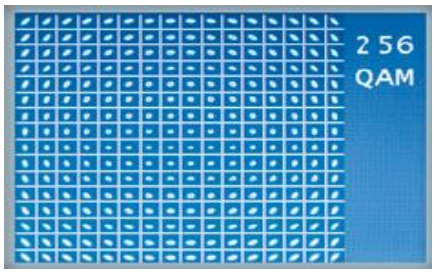
Symbol rates – 5.057, 5.361 MSym/s Modulatio Scheme – 64, 256 QAM De-Interleaver Depths – I=8 / J=16, 16/8, 32/4, 64/2, 128/1 Mesurement Parameter (acc. ETR290) BER (after Viterbi): - 1.00e-8 MER – up to 40 dB – Res. 0.1 dB – Acc. +/-1.5dB Search mode	
QAM-Demodulator (acc. ITU-T J83B) Symbol rates – 5.057, 5.361 MSym/s Modulation Scheme – 64, 256 QAM De-Interleaver Depths – I=8 / J=16, 16/8, 32/4, 64/2, 128/1 Mesurement Parameter (acc. ETR290) BER (after Viterbi): - 1.00e-8 MER – up to 40 dB – Res. 0.1 dB – Acc. +/-1.5dB Search mode Power Supply	Acc. EN 61010-1 **EMV** Acc. EN 61326-1 **DIMENSIONS** 360 mm x 160 mm x 300 mm **WEIGHT** ca. 6.1 kg mit eingebautem Akku / incl. Built in battery **ACCESSORIES**
Built-in primary power supply: 100-120V AC , 200-240 V AC , 50-60 Hz Power consumption – max. 45 W 12V external (Socket acc.DIN45323) Voltage – 10-15 V DC; Current – max. 4 A Li-Ion Battery Capacity – 14.4 V/6.75 Ah Operating time – min. 3 h Automatic Swich-Off at low current Battery Management – Capacity Display	Power cable, IEC cable 75 Ohm, Manual, USB stick

Overview about interfaces: Ethernet, RJ45, ASI In/Out over BNC, USB-A, USB-B, SCART, DIV-out.

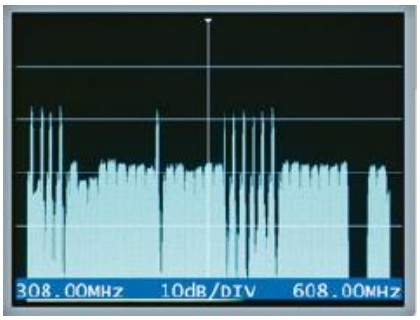
The bag do not only offers optimal protection but also access to all interfaces during operation.



Measurements over time span



Hum modulation/Phase Jitter



Broadband spectrum with analog and digital transponders

Two separated displays with high contrast