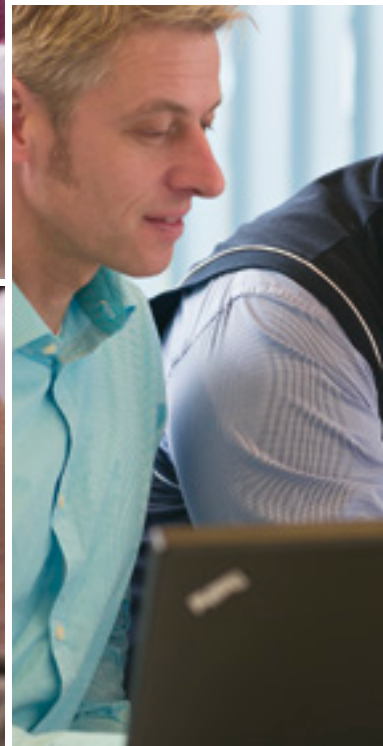
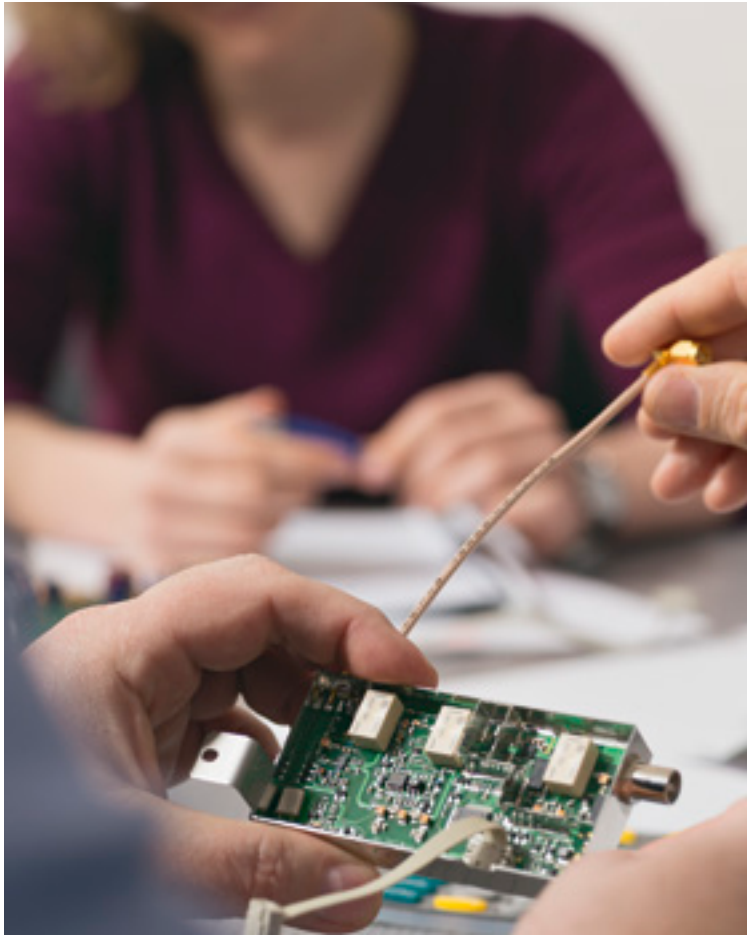


# KWS ELECTRONIC

HIGH FREQUENCY TEST EQUIPMENT

PRODUCT LINE E









For over 35 years KWS-Electronic has been developing and implementing solutions that point to the future. Based on very efficient hardware KWS-Electronic offers retrofit measuring receivers for the professionals who value long-term value retention as well as high investment security.

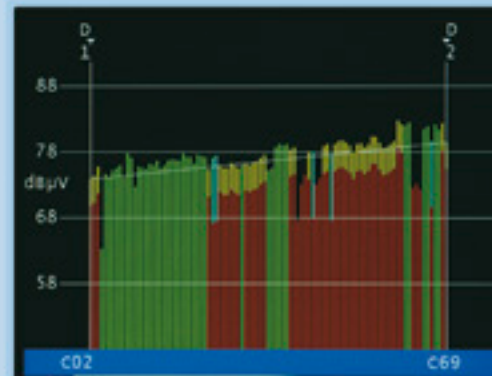
We offer concepts to match your requirements: antenna measuring technology from KWS-Electronic should facilitate your professional task as far as possible. Flexible to your requirement – you can define the configuration for your AMA or VAROS measuring receiver as you want it.

New standards are set in terms of innovation, precision and handling – something all KWS-Electronic products have in common. Count on innovation that pays off and place your trust in KWS-Electronic's extensive know-how and many years of experience.

Today, tomorrow, and beyond.

**VAROS** TECHNOLOGIE

Dimensions in mm: 206 w × 297 h × 84 d  
Weight 2,5 kg



**UPSTREAM GENERATOR**

Status: TRANSMITTING... 03.05.13 11:50:37

Modulation: Ein (QAM PRBS)

US	Frequenz	Pegel	Modul.	Symbolrate
1	10.0MHz	100dBμV	16QAM	2560kBd(3.2MHz)
2	25.0MHz	100dBμV	64QAM	5120kBd(6.4MHz)
3	45.0MHz	100dBμV	16QAM	640kBd(800kHz)
4	60.0MHz	100dBμV	16QAM	2560kBd(3.2MHz)

SINUS/QAM KONFIG. SENDEN SPEICHERN ZURÜCK







- High resolution luminous 5.7" colour TFT
- Frequency range from 5-867 MHz
- Analogue: FM, TV (RF level measurement)
- Digital: DVB-C (RF level/BER/MER/packet loss)
- MPEG 4 decoder for SD and HD picture display with CI slot
- NIT evaluation
- LCN display
- DOCSIS analyser (DOCSIS 3.0)
- Digital analyser for all ranges, tilt measurement
- Signal quality monitoring with data grabber
- Measurement data storage via USB
- Upstream generator 5-65 MHz (CW and PRBS)
- EMI measurement according to German SchuTSEV regulation
- DVI out
- Rechargeable lithium ion battery 7.2 V/6.6 Ah

The technical data sheets and device-specific downloads are available from our homepage [www.kws-electronic.de](http://www.kws-electronic.de).

The innovative  
cable TV handheld device:

# VAROS 107

## Cable TV measuring receiver

The VAROS 107 was specially designed for installation and maintenance of cable TV networks. The large high resolution TFT display, the backlit keyboard, the built-in DOCSIS 3.0 and EMI measurement (according to German SchuTSEV regulation) all contribute to making work for the technician easier.

A notable technical innovation is the in-built upstream generator for the return path. The device supports up to 4 parallel carriers (CW or PRBS). The AMA 310 can evaluate the carriers with respect to RF level, BER, MER and constellation diagram. As a result, it is possible to analyse the upstream for all the digital parameters as well as the RF level. Long-term measurements are possible with the data grabber.

**VAROS** TECHNOLOGIE



Dimensions in mm: 164 w x 266 h x 170 d  
Weight 1,3 kg

SAT-HF 11.382 [GHz]  
KUL 500 SR 22000  
3 UBS ermittelt!  
SCR-ADR0(UB1)=1280MHz  
SCR-ADR1(UB2)=1382MHz  
SCR-ADR2(UB3)=1484MHz  
UBs in BANK0 übernehmen!  
UBs in BANK1 übernehmen!  
UBs in BANK2 übernehmen!  
UBs in BANK3 übernehmen!  
P1 V/IUB1  
IInb [mA] 147

SAT-HF 11.382 [GHz]  
KUL 500 SR 22000  
Antennendosen Konfigurator  
UB1 UB10  
n-1 XXXXX XXXXXXXXXXXX  
n-2 XX XXXXXXXXXXXXXXXX  
n-1 XXXXXXXXXXXXXXXXXXXX  
akt. XXXXXXXXXXXXXXXX  
konfig. auslesen  
konfig. schreiben  
IInb [mA] 0







For SAT specialists:

# VAROS 109

## Satellite measuring receiver

- High resolution luminous 5.7" colour TFT
- Frequency range from 910-2,150 MHz
- DVB-S and DVB-S2
- RF level, BER, MER, packet loss for SAT transponders
- MPEG 4 decoder for SD and HD picture display with CI slot
- NIT evaluation
- Spectrum analyser for narrow/broadband modes
- Scan functions for reliable satellite recognition
- DiSEqC, UNICABLE, JESS
- Programming function for addressable antenna outlet
- Measurement data storage via USB
- DVI out
- Rechargeable lithium ion battery 7.2 V/6.6 Ah

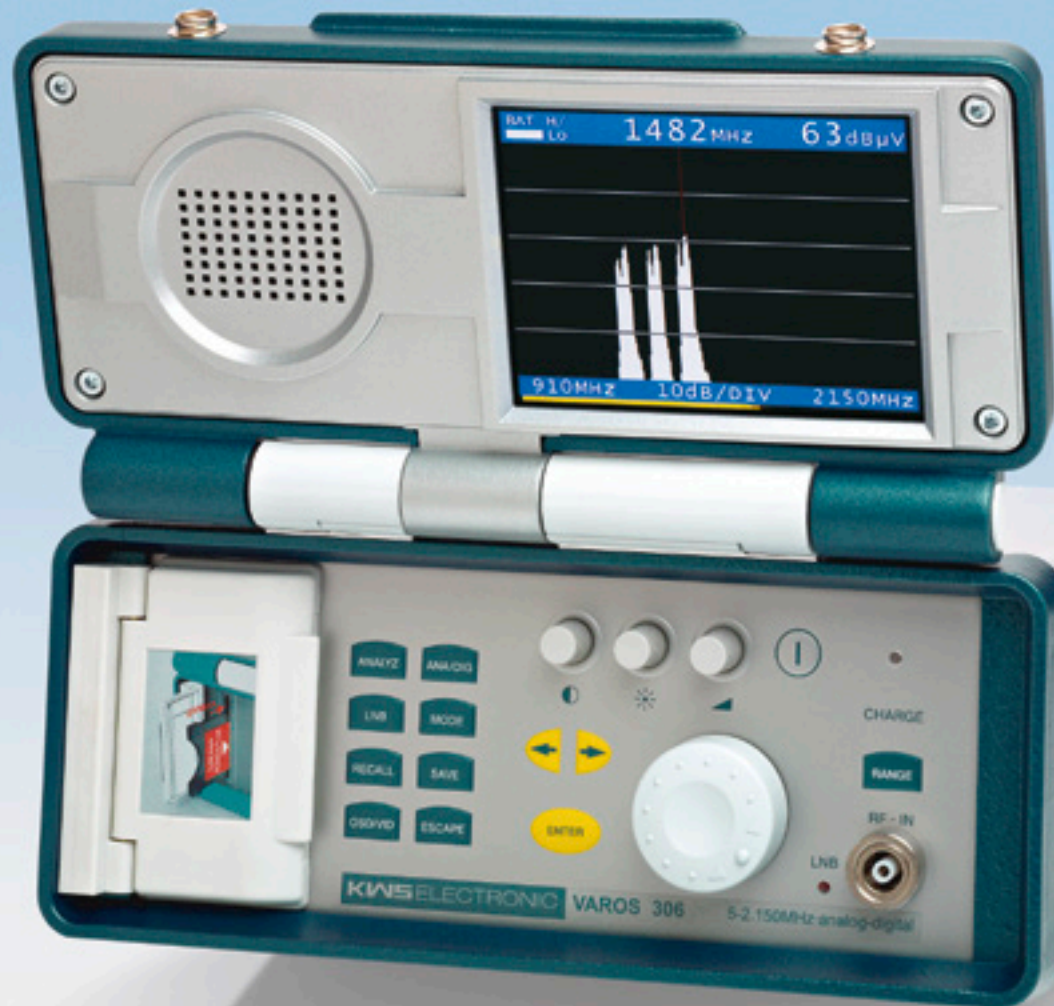
Compact device and yet a full-fledged satellite measuring receiver: the VAROS 109 is used for installation and troubleshooting in classic multi-switch systems as well as UNICABLE/JESS distribution networks.

The unit is equipped as standard with an MPEG 4 decoder for displaying SD and HD images. An external display can be supplied with digital signals via the DVI interface.

The scan function has access to a comprehensive list of pre-installed satellite positions. The unambiguous display, especially with regards seldom used orbital positions, significantly reduces time consuming searches. The packet loss counter supports to localize critical problems.

The technical data sheets and device-specific downloads are available from our homepage [www.kws-electronic.de](http://www.kws-electronic.de).

**VAROS** TECHNOLOGIE

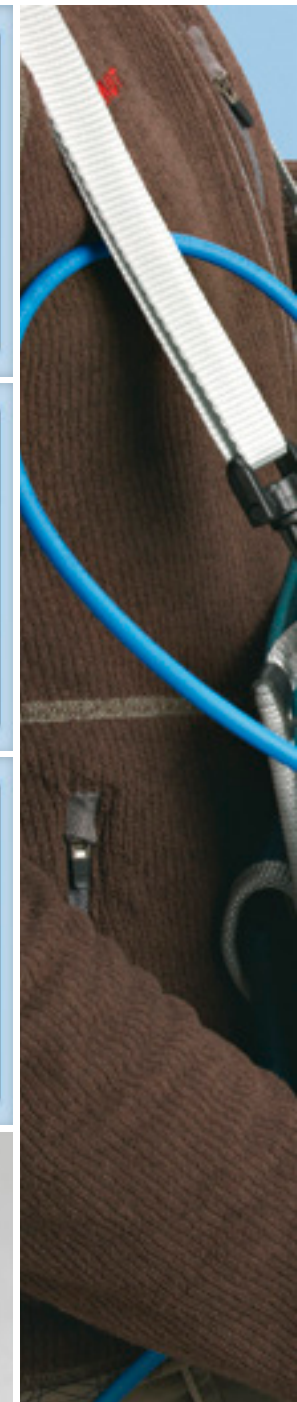


Dimensions in mm: 252 w x 135 h x 272 d  
Weight 4,4 kg

TV	E68	DVB-C
BAT		locked
		SR 6900
		QAM256
PEGEL [dBµV]	75.5	
PE=	182 / 00.00.51	MER [dB]
BER	<1.00e-8	>35.0
Programmsuche fertig!	Fernspeisg 0V	
	Irbmt [mA]	0

SAT-HF	11.332	DVB-S2
[GHz]		
105 Einträge für SATELLIT		
Eutelsat Hot Bird 13A/H 13.0° Ost		
TP: Name	HF [GHz]	SR Mod
125 Mediaset I	11.013 H	27500 DVBS
127 RTL Schweiz	11.054 H	27500 DVBS
129 Eurosport	11.096 H	29900 DVBS2
131 Motors TV	11.137 H	27500 DVBS
133 Alkarma TV	11.179 H	27500 DVBS
1 Disney Jun	11.219 H	29900 DVBS
3 wojna i Po	11.258 H	27500 DVBS2
5 Al Jazeera	11.296 H	27500 DVBS
0	11.334 H	27500 DVBS2
7 Italia 1 H	11.334 H	27500 DVBS2
Irbn	[mA] 0	

SAT-HF	11.303	DVB-S2
[GHz]	KuL	locked
BAT	000	SR 22000
		CR=2/3 8PSK
PEGEL [dBµV]	67.5	
PE=	0 / 00.00.45	MER [dB]
CBER	7.65e-4	16.7
Programmsuche fertig!	UNICABLE	
ORF	P1 H/Lo UB1	Irbn
19.2° Ost		[mA] 223







No compromise:

# VAROS 306

## Antenna measuring receiver

- High resolution luminous 5" TFT screen
- Frequency range from 5-2,150 MHz
- RF Level measurement for return path, FM and analogue TV
- DVB-S, DVB-S2, DVB-C, DVB-T: RF level measurement, BER, MER, packet loss
- MPEG 4 decoder for SD and HD picture display with CI slot
- NIT evaluation
- Spectrum analyser for all ranges
- Scan function for secure satellite identification
- Echo measurement for DVB-T (impulse response)
- DiSEqC, UNICABLE, JESS
- Programming function for addressable antenna outlets
- Measurement data memory/Screenshots directly via USB
- Video/audio input/output via SCART, DVI out
- Rechargeable lithium ion battery 7.2 V/6.6 Ah

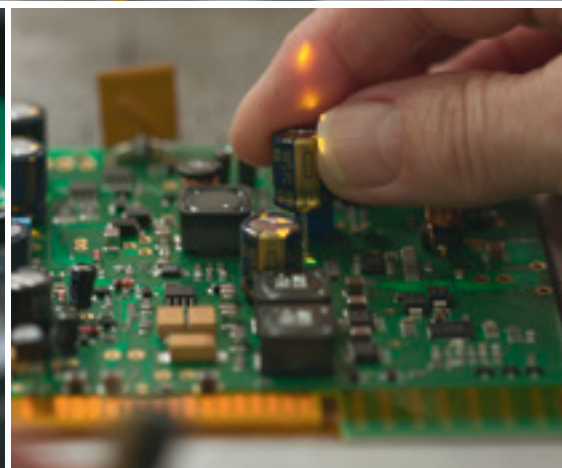
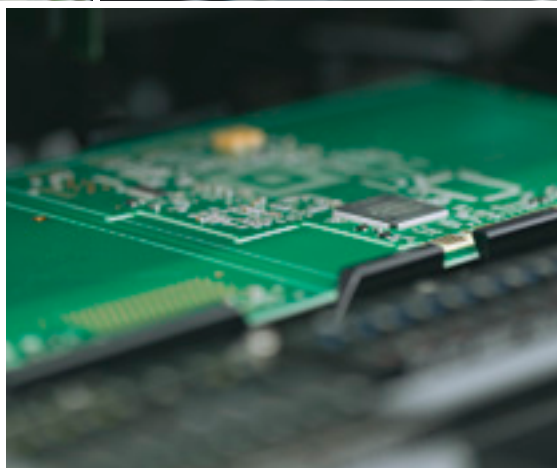
### Possible options

- DVB-T2 measuring module
- DAB/DAB+ measuring module

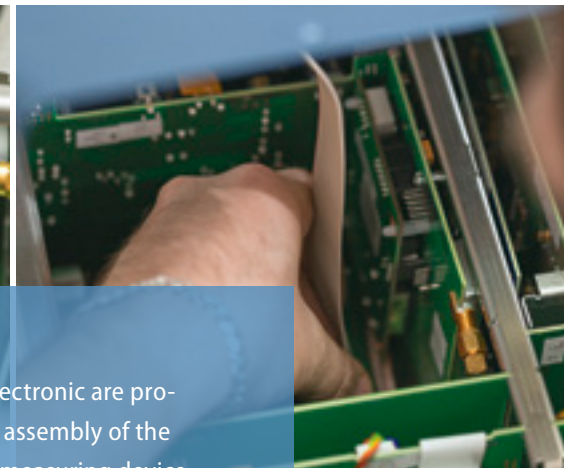
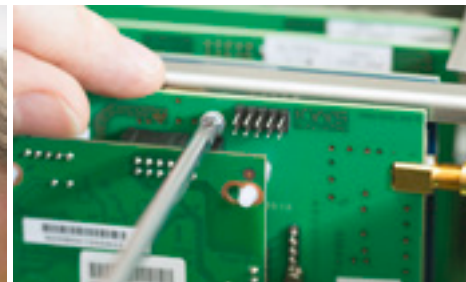
You want high measurement accuracy and a completely equipped device with minimum investment? You require easy handling? The VAROS 306 provides you with the answers for both today's and tomorrow's questions.

Many of the technical innovations and improvements from the AMA technology have been incorporated in this device concept. A clear and concise presentation of the measured values or undisturbed picture evaluation is possible any time using the 5" VGA colour TFT.

Documentation made easily: measured data (xml) and screenshots (bmp) can be stored directly on a USB stick. This allows for trouble-free processing and archiving of data. The VAROS 306 has a scan function for reliable retrieval of satellite positions.





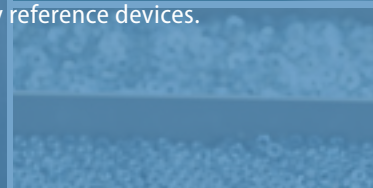
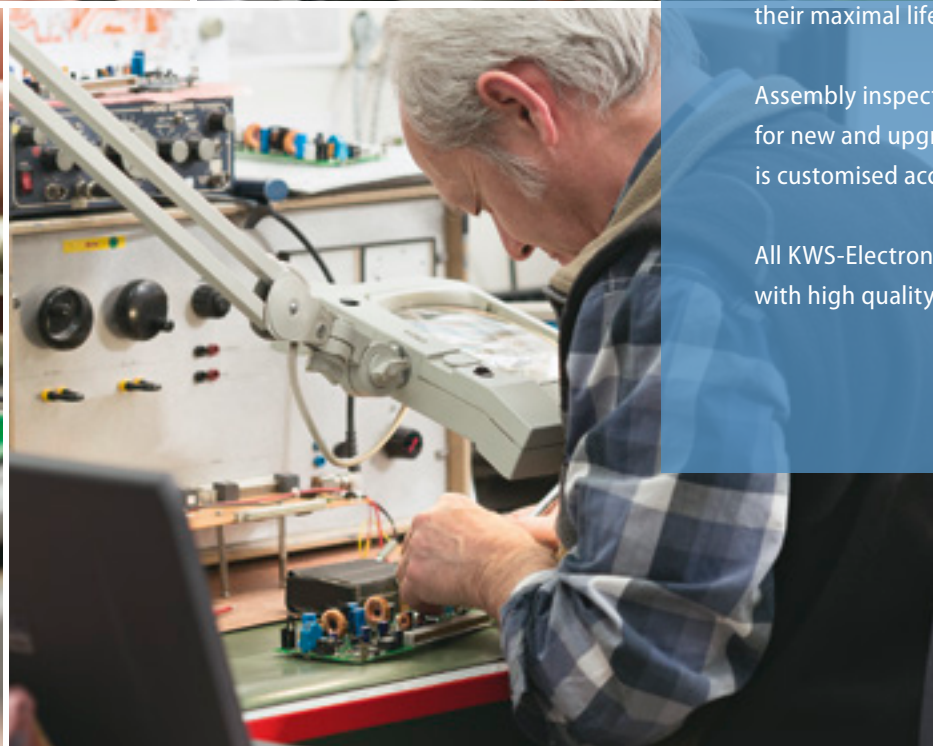


This is the way sophisticated measuring devices from KWS-Electronic are produced in the upper Bavarian town of Tattenhausen; from the assembly of the printed circuit boards right up to the packing of the finished measuring device.

An ultra-modern SMT production line (MYDATA) places the components on the boards before they are completed in the manual production. We solder RoHS compliant (lead-free). By doing so we ensure the components used achieve their maximal lifespan.

Assembly inspection: Only optically and electrically tested modules are used for new and upgraded devices as well as repairs. Each KWS measuring receiver is customised according to customer's specifications in the final assembly.

All KWS-Electronic measuring devices are thoroughly checked and calibrated with high quality reference devices.



- Possible options
- S/N measuring module
  - DVB-T2 measuring module
  - DAB/DAB+ measuring module
  - DOCSIS-analyser 3.0
  - CATV frequency range up to 1,050 MHz
  - EMI measuring module

Dimensions in mm: 360 w x 160 h x 300 d  
Weight 6,1 kg







- High resolution luminous 5.5" TFT screen
- Frequency range from 5-2,150 MHz
- Analogue: FM, TV
- Digital: DVB-S, DVB-S2, DVB-C, DVB-T
- Return path: RF level, BER, MER and constellation diagram in conjunction with VAROS 107
- MPEG 4 decoder for SD and HD picture display with 2 CI slots
- Real time constellation diagram
- Hum and phase jitter verification
- CATV: MER up to 40 dB, S/N (analogue) up to 55 dB
- Digital analyser for all ranges, tilt measurement, ingress measurement
- Echo measurement for DVB-T (impulse response)
- Video text analogue/digital, DVB subtitling
- DiSEqC, UNICABLE, JESS
- Programming function for addressable antenna outlets
- Signal quality monitoring with data grabber
- Printer for measured values and screen shots
- USB, SCART in/out, DVI out, Ethernet (RJ 45)
- Rechargeable lithium ion battery 14.4 V/6.6 Ah

Professional technology  
doesn't have to be complicated.

# AMA 310

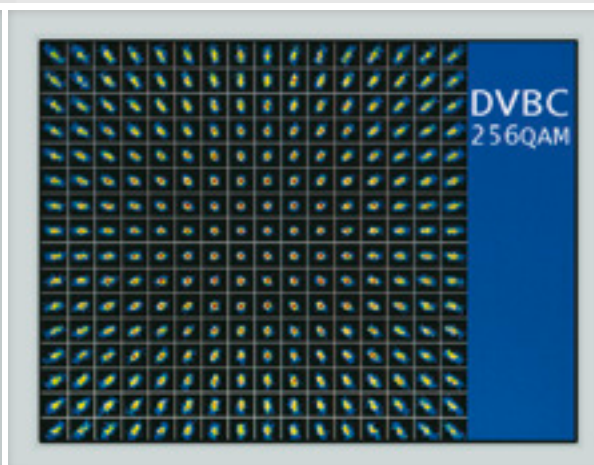
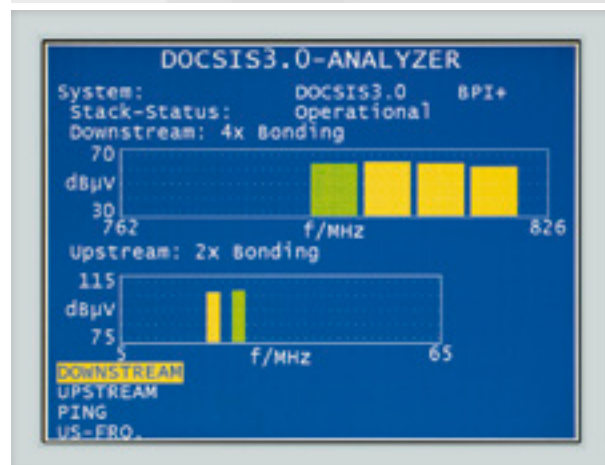
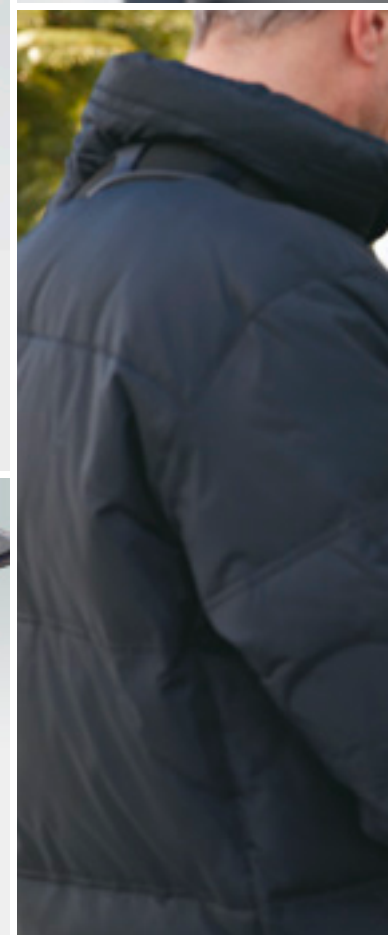
## Antenna measuring receiver

The AMA 310 is an obvious step into broadband measuring technology. Despite having an abundance of functions thanks to the time-proven KWS concept it still retains a clear user friendly interface.

Advanced modules and a sophisticated matured housing concept ensure extreme durability and longevity. Extensive surveillance and monitoring functions, diverse copy and save functions are outwardly visible qualities of the AMA 310.

Despite the high level of module integration all EMC specified guidelines are strictly observed.

As a result, with KWS measuring devices it is virtually impossible for components to interfere with each other thereby falsifying the measurement results.







AMA TECHNOLOGIE

# AMA 310

## Antenna measuring receiver

The user can comfortably generate and process the measuring receiver's memory lists with the PC software »AMA.remote«. In addition, the software enables the AMA 310 measuring receiver to remotely query and monitor via SNMP (Simple Network Management Protocol).

The user can check cable networks for RF leakage using the EMI option in the AMA 310 in conjunction with additional equipment available from KWS-Electronic. Locating leaks, which are largely responsible for increased interference, is as a result greatly facilitated.

The functional bag not only offers protection for the device but also enables the smooth operation of the instrument. The large opening side flaps provide easy access to all the interfaces.

The new DOCSIS analyser in the AMA 310 was implemented in accordance with the DOCSIS 3.0 specification. Both Euro-DOCSIS and US-DOCSIS signals can be measured. Channel bonding, as available with DOCSIS 3.0, is presented in a highly visible graphical manner. The active downstream and upstream are clearly shown.

With the AMA 310 it will be possible to assess the quality of the transmission in return path with greater confidence. With the VAROS 107 used as signal source – e.g. at the outlet – the AMA 310 displays the RF level, BER, MER, and constellation diagram for the received signal in the return path – e.g. at the house amplifier.

An overview of the various option packages as well as information about the »AMA.remote« software is available on our home page [www.kws-electronic.de](http://www.kws-electronic.de).

Frequency range Noise generator	10-2.200 MHz
Level output Comb generator	85 dBμV with 1 MHz bandwidth
Frequency range HF generator	10-1.000 MHz in 10 MHz steps
Level output HF generator	80 dBμV
RF divider	0-30 dB in 2 dB steps additional 10 dB continuously adjustable
Power supply	integrated NiMH rechargeable battery pack 6 V/2,1 Ah for about 3.5 hours of continuous operation
Included	Cable, F-connector adapter, AC/DC power adapter, user manual, carrying case



# NCG 230

## Noise/Comb/S-generator

This generator serves as a defined signal source for antenna systems and other radio transmissions operating in this range. The device is ideal for allocating antennas, filters, as well as cable network and SAT systems after installation with the transmitted frequencies. Assessment is via a measuring receiver.

The NCG 230 is a compact mobile signal source for the frequency range from 10-2,200 MHz. It generates white noise in this frequency range. It also generates a comb signal between 10-1,000 MHz with 10 MHz intervals.

An RF generator is integrated providing a means to measure interference (EMI). The signal is fed into the network in orders to assist locate leakages in the distribution network.



# IRM 232

## Impulse reflectometer

### Measurement principle

The IRM 232 works on the TDR (Time Domain Reflection) method. The pulses fed into the cable are reflected by the existing cable faults and shown in the display. The fault types and fault distances can be determined by the form and the time lag of the reflections.

### Antenna technology

Discontinuities are a major problem in coaxial distribution networks. For example, pinched cables or bad coaxial connections can affect analogue and digital signals and as a result generate standing waves.

Standing waves are also reflected into the network by exposed cables (75  $\Omega$ ) or short circuits.



Measurement range	0-25, 0-50, 0-100, 100-200,...1900-2000 m
Resolution	0,25 m · 0,5 m · 1 m · 4 m
Accuracy	1 % of measurement range
Cutting factor	nvp 0,300-0,999 (10 values can be stored to memory)
Impedance	75 $\Omega$
Power supply	integrated battery pack
Scope of delivery	protection bag, user guide, mains power supply, transport case







Setting a precedent:

## Seminars at KWS-Electronic

Goal of AMA seminars is to identify and document all kinds of errors in larger distribution networks. Especially issues such as the evaluation of constellation diagrams and NIT tables are explained.

Distribution network basics are addressed marginally in the AMA seminars.

Goal of VAROS seminars is to make the technicians fit for simple and uncomplicated problem solving when out on the network.

The operation of the measuring devices and interpretation of measured values are addressed extensively.

Please note: the seminars at KWS-Electronic are only held in german language.

In addition to providing on-site training at wholesalers, chambers of craft, and electrical guilds, KWS-Electronic also offers you the opportunity to participate in 2-day seminars directly at the company in Tattenhausen. These intensive courses constitute a successful combination of theoretical knowledge and its application in daily usage. The practical part is completed with hands-on troubleshooting on realistic test walls.

In the picturesque foothills of the Alps we provide a seminar group of maximal 8 participants exactly the knowledge they need to successfully deploy their KWS measuring receiver.

Knowledge as a competitive advantage – seminars from KWS-Electronic provide you with know-how that pays dividends.



# KWS ELECTRONIC

## HIGH FREQUENCY TEST EQUIPMENT

Are you interested in obtaining further information about our products, solutions and services?

KWS-Electronic is at your disposal with expert advice. Call us or send us an e-mail.

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### **Sales**

Hans-Peter Schenk, Lois Röhl, Kathrin Dirscherl

### **Training/Seminars**

Lois Röhl, Hans-Peter Schenk

### **Service/Technical Support**

Lois Röhl, Marc Maier, Emmeran Nemeth,  
David Schmidt, Thomas Stelzer