



Telco Trends 2014

Test & Measurement

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KWS-Electronic GmbH

Some Facts about KWS-Electronic...

History...

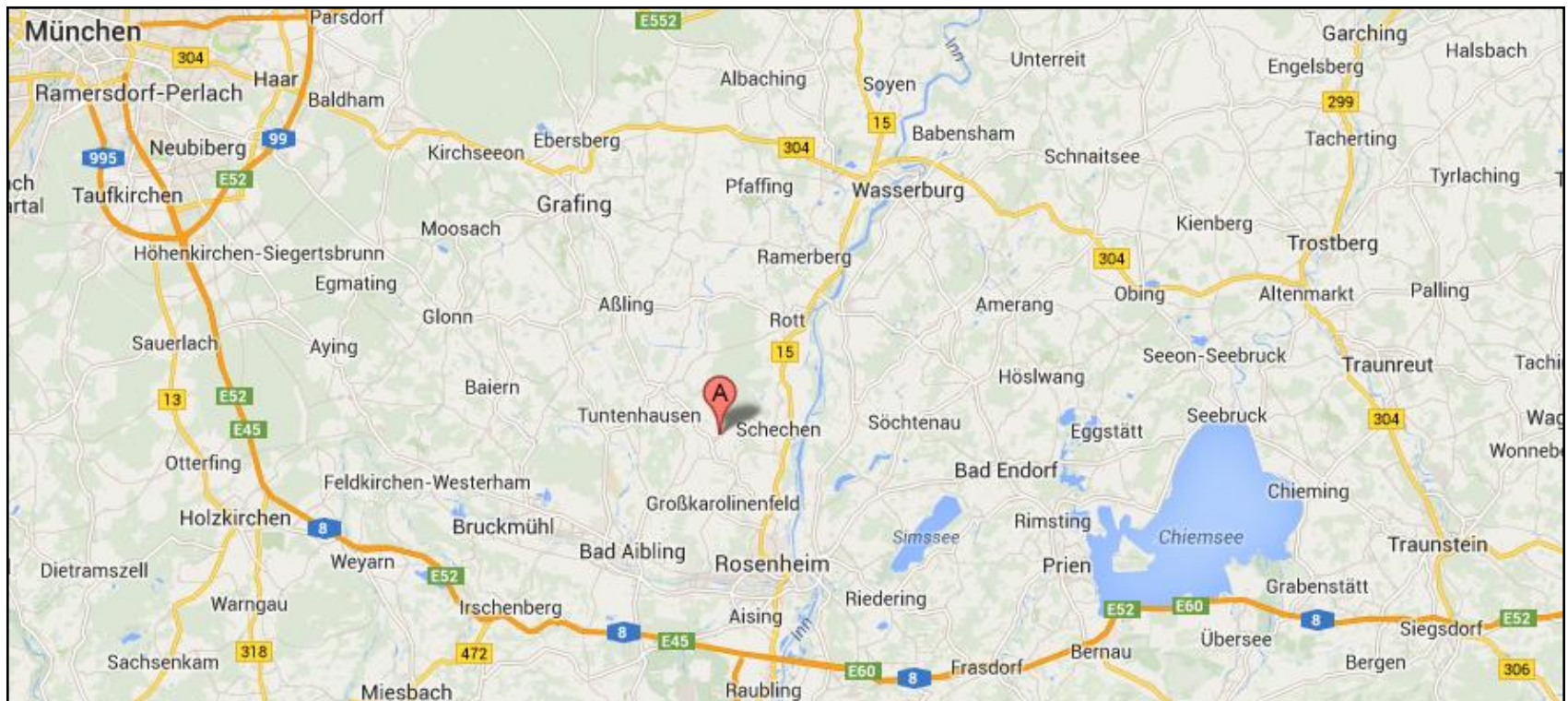


- Founded in 1960 by Wilhelm KOLLER
Hubert WENZEL
Sylvester SCHENK
- Company based in Tattenhausen, in south-east of Munich, Bavaria
- 40 employees at the moment
- close to customers with own R&D, production, service

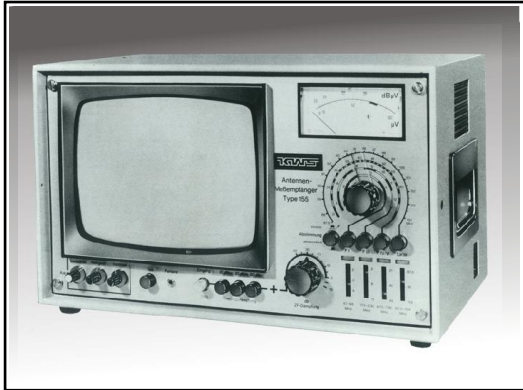
Products...

- Antenna Measuring Receivers AMA and VAROS:
- more than 35 years of experience in this field
 - more than 40.000 units sold
- Additional Electronical production of boards and components for several companies in our region

KWS Electronic GmbH
Sportplatzstrasse 1
D-83109 Großkarolinenfeld-Tattenhausen
Germany



50 years KWS: some history meters...



TYP 155 / first model in 1974



AMA 200 / with teletext in 1984



AMA 202 / with automatical level correction and attenuation 1987

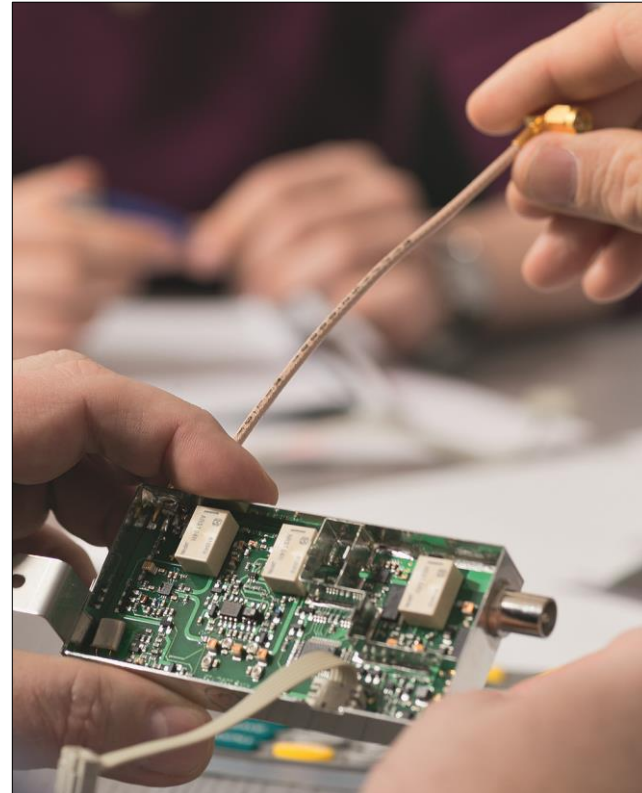


ME 205 / CATV level meter 1988

Our R&D engineers: we know what we are talking about...

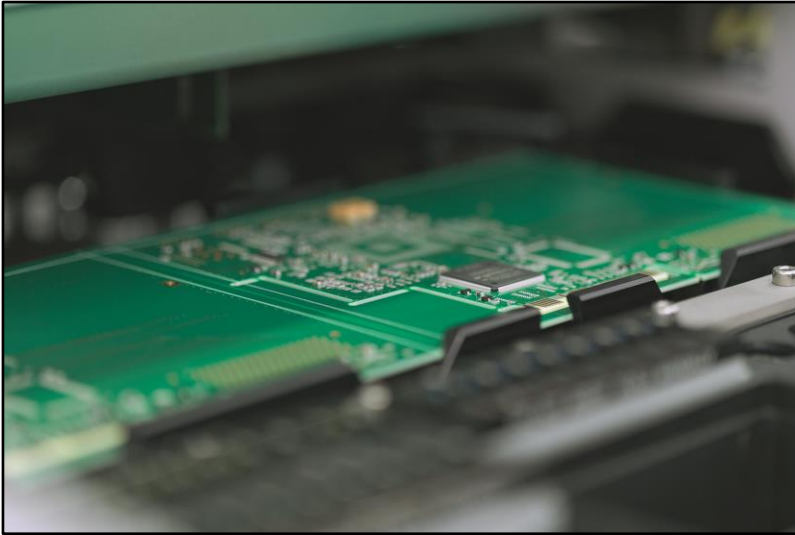


R&D meeting



A new board is released

Made in Germany: top quality is a logical thing for us...



SMD assembly:
New and highly precise pick-and-place machine with up to 20.000 comp./h (multilayer boards up to 12 layers and components down to 0402)



Detailed control: always better than good...



Every single board is checked accurately before integrated into an AMA or VAROS model



Final check of an AMA 310 with calibration

When buying new test equipment...

Three main aspects for your decision to buy test equipment should be:

1. The handling of a new meter must be really easy and has to support the technician in his job.
2. Accuracy! Our measurements are based on physical principles, not on software emulations.
3. An instrument must offer long-term use and be upgradeable with hardware and firmware.

When buying new test equipment...

Handling

The handling of a new meter must be really easy and has to support the technician in his job.

What is the value of a cheap meter when no one in your company can use it because it is not easy to use? 0

All functions and upgrades must fit into the basic handling concept.

When buying new test equipment...

Accuracy of measurement

Measurement results must be based on physical methods.

Many competitors are using emulations, for example at QAM 256. This causes inaccuracies and faulty measurements.

The high quality of our products is based on:



MADE IN GERMANY

When buying new test equipment...

Upgrades / long-term use

Technique is changing rapidly.

Therefore it is more and more important to have instruments that can be upgraded in hardware and software.

Buying new instruments is expensive. This investment can only come back after years. But therefore you must be able to have upgrades.

Upgrades are always cheaper than buying new.

The hardware concept of KWS allows this.

SATELLITE METER VAROS 109

Features

- 5,7" VGA color-TFT
- 910 MHz-2.150 MHz
- DVB-S and -S2
- SCAN-function for satellite identification
- Level measurement, BER and MER
- Data logger on USB
- MPEG2/4 video (SD and HD)
- CI-slot for CA-Module and Smart-Card
- DVI-out
- DiSEqC/UNICABLE
- Lithium-Ionen batteries 7,2V/6,6 Ah
- Works under: battery/mains/12-V external
- Dimensions: w 164 x h 266 x d 70 mm
- Weight 1.3 kg
- New option: constellation diagram
- New option: optical input SC/APC (power...)



CATV Meter VAROS 107

Standard Features

- 5.7" VGA Color-TFT
- Frequency range 5 MHz-867 MHz
- Analogue: TV and FM
- Digital: DVB-C (level/BER/MER/packet errors)
- MPEG4 Decoder for SD and HD video, DVI out
- NIT evaluation
- LCN indicatio (Logical Channel Number)
- Analyzer function for all ranges with TILT
- DOCSIS-Analyzer (Docsis 3.0)
- Signal monitoring with datagrabber
- Measurement storage and screenshots on USB
- Upstream generator 5-65 MHz (CW or PRBS)
- EMI measurement
- Li Ion battery pack 7.2V/6.6Ah
- Dimensions W 206 x H 297 x D 84 mm
- Weight 2.5 kg with battery pack
- **New option: optical input SC/APC for fiber signals (power, OMI...)**



COMBI METER VAROS 306

Basic Features

- 5" VGA color-TFT
- 5 MHz-2.150 MHz
- Level measurement for analog signals (FM/TV/SAT)
- Level measurement in return path
- DVB-S, DVB-C and DVB-T: Level, BER, MER
- MPEG 2/4 decoder (SD and HD)
- Analyzer for all ranges
- Video/Audio in-/out via Scart, DVI out
- Data logger on USB
- CI-slot for CAM with Smart-Card
- Mains and 12V operation
- NiMH batteries, charger integrated

Options

- DVB-T2 Frontend
- DAB/DAB+ measurement module



COMBI METER AMA 310

Standard Features

- Analog: FM; TV; SAT
- Digital: DVB-S/-S2; DVB-C; DVB-T
- Return path measurement/ Euro- and US-DOCSIS
- HUM (in%) and phase jitter (in °) measurement
- CATV: MER up to 40dB
- Digital analyzer for all ranges
- Real-time constellation diagram for DVB
- Impulse response for DVB-T
- Printer / teletext analog and digital / DVB subtitling
- DiSeqC 1.0/1.1/1.2 /2.0 /UNICABLE/JESS
- MPEG2/4-Decoder with NIT
- Signal monitoring (level-BER-MER-S/N)
- USB-A, USB-B, SCART, Ethernet (RJ45)
- AMA.remote software



COMBI METER AMA 310

Options

- Analog TV: S/N measurement (1Vpp) up to 55dB
- DVB-T2 Frontend
- DOCSIS-Analyzer (DOCSIS 3.0)
- EMI measurement
- CATV extended range up to 1.050 MHz
- DAB/DAB+ measurement and demodulation
- AMA.remote: remote control and monitoring software via SNMP
- New option: optical input SC/APC (power, OMI...)



CATV Measurement

Hum/Phase jitter
on DVB-C signals

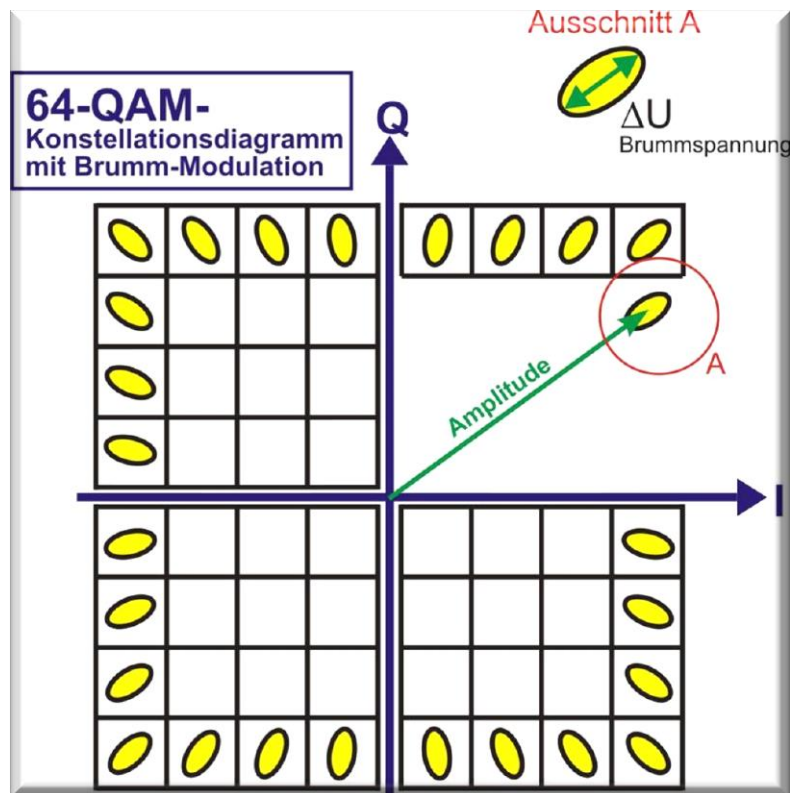
HUM-MODULATION / PHASE JITTER

Basics

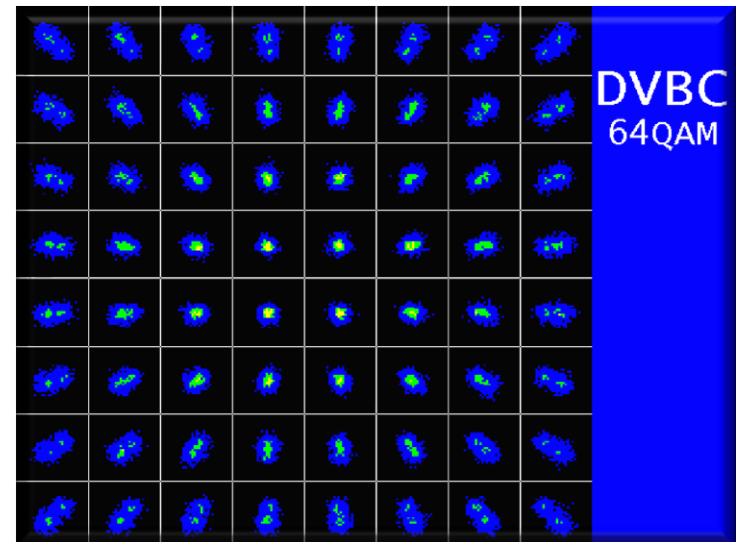
- Consumer products show various effects at the antenna outlet. The technician can not find a problem, his instrument does not show a fault. Where is the problem? Is it the new Flat-TV? Is it your installation?
- Hum-Modulation and Phase jitter are eliminated in the input attenuator of a meter. So how to find it? A low-cost Flat-TV does not show any problems, but the high-end Flat is making problems.....
- Hum is caused by amplifiers or potential problems in networks. Phase jitter is only possible in headends.
- The KWS AMA meters have adjustable input attenuators. So your AMA can be switched as bad as a Flat-TV and show the problem.

HUM-MODULATION

Basics

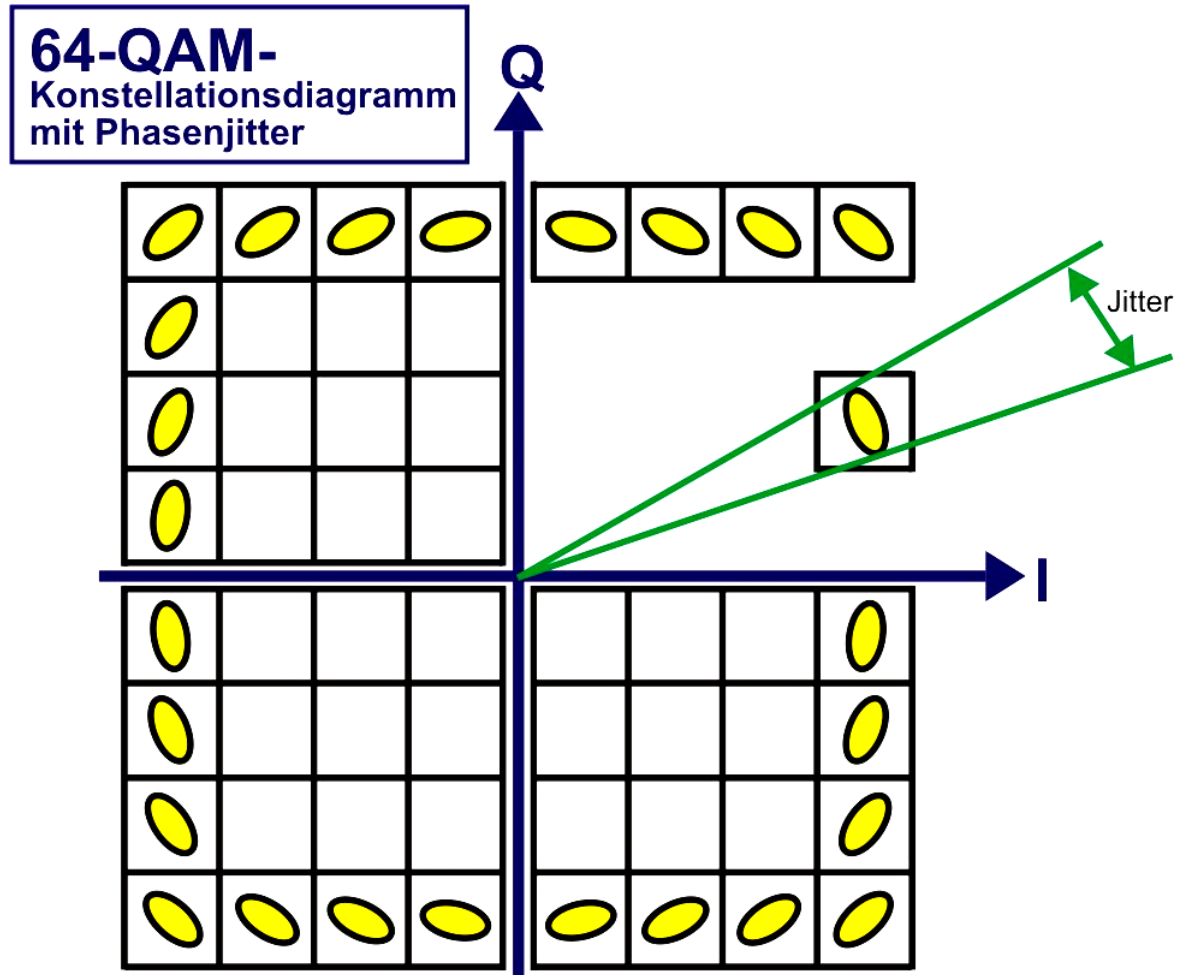


Schematic of Hum



Constellation diagram with Hum modulation

PHASE JITTER



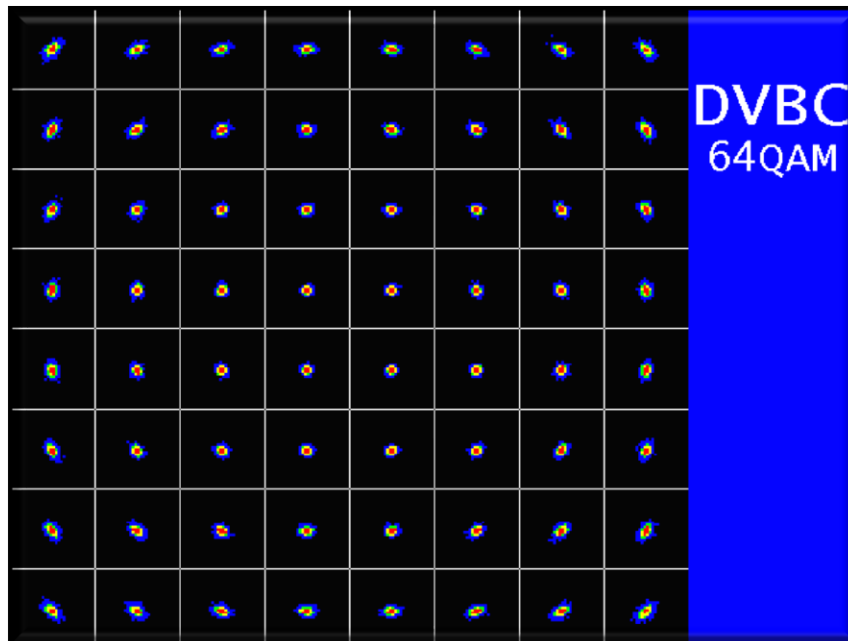
PHASE JITTER

When switching the AMA to Jitter mode the PLL function is limited. The display shows the !

In the display you can also see the angel of the jitter. In this case it is 0.53 degrees.



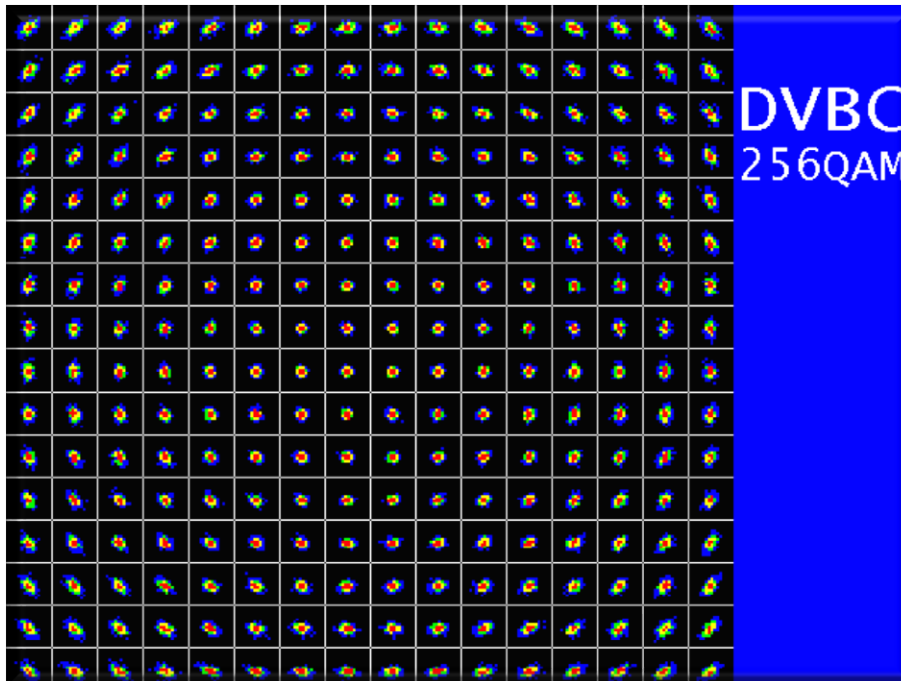
PHASE JITTER 64QAM



We made the experience that a jitter of 0.5 is no problem in 64 QAM signals. Problems may start at a jitter angle of 0.9.

Note!
In 64QAM only a small jitter effect.

PHASE JITTER 256QAM



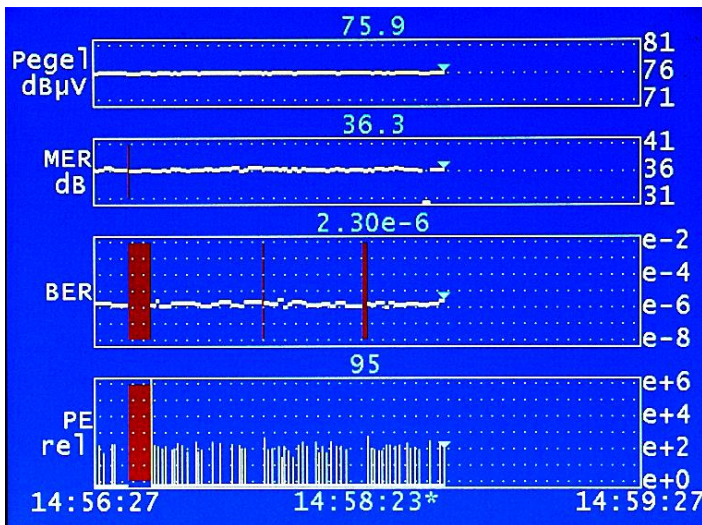
The same jitter at 256 QAM might cause problems. We see 0.5 degrees as an orientation for first problems at 256 QAM.

DATA GRABBER

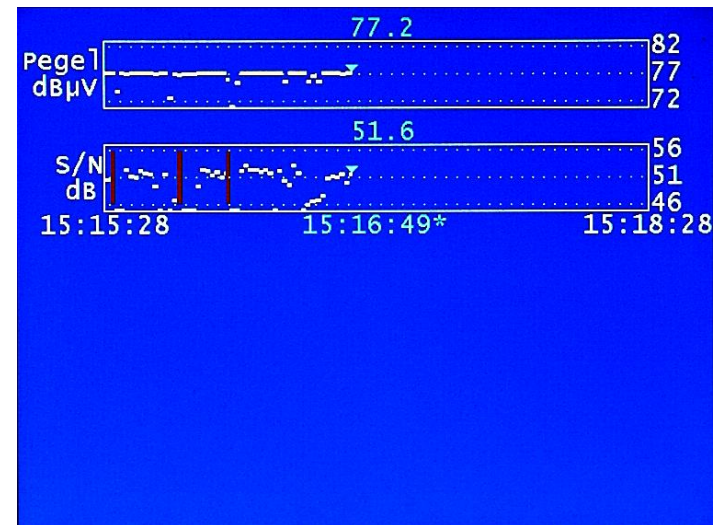
Quality monitoring for
analog and digital signals

MEASUREMENT AND DATA MONITORING WITH THE DATAGRABBER

You can move the cursor to any position in the diagram, for example where the problems started. At this point in the diagram you can read the exact time.



DVB-C

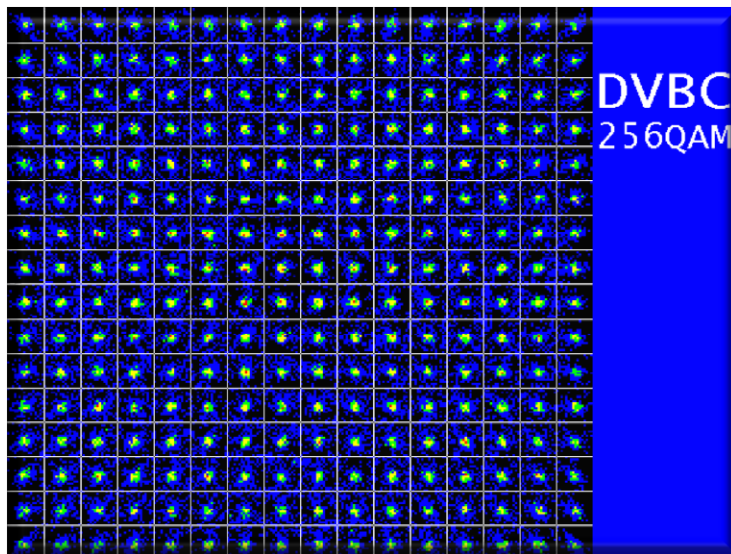


Analog signal

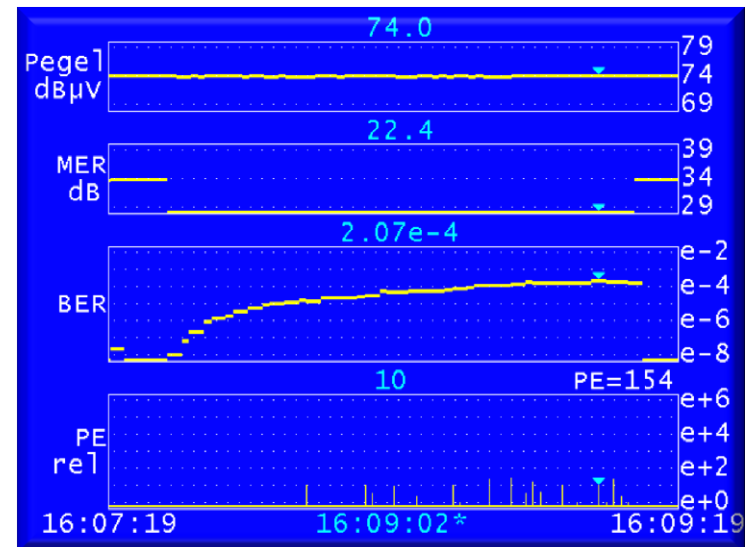
MONITORING OF A SIGNAL WITH HUM

A 256 QAM signal with massive hum problems.

This problem can only be seen with limited AGC adjustment.



Constellation diagram with Hum



Level is stabil; MER and BER are getting worse.

Channel monitoring AMA 310

Analog and digital signals

What can you monitor?

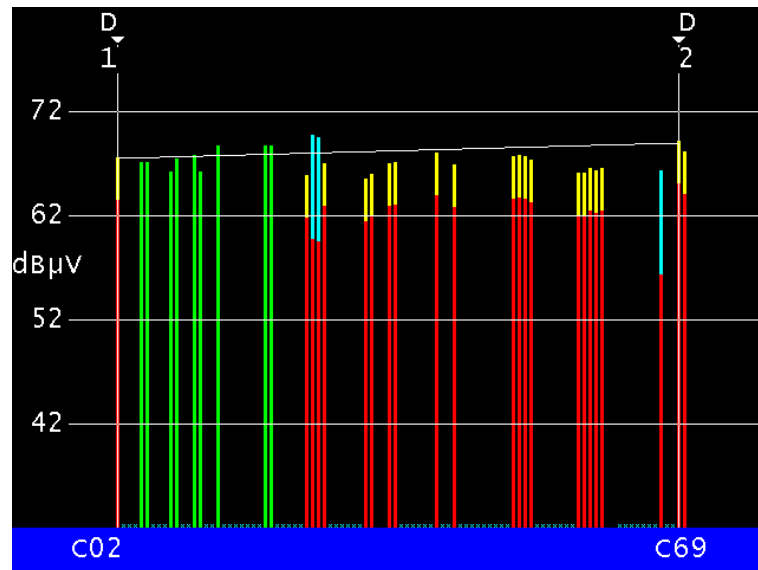
Signal type	Medium for documentaion	Monitoring time	Measurements and tolerances
DVB-S DVB-S2	printer	Free adjustable from 00:01 hrs. to 23:59 hrs.	Analogue signals: Level and S/N
TV analog DVB-C DVB-T	and/or USB-Stick or internal flash		Digital signals: Level, MER, BER and PE (Packet errors)
FM			Protocol limits free adjustable
DOCSIS			

TILT FUNCTION

Analyzer mode and measurement with TILT

The TFT shows the spectrum with the adjusted channel plan. The level correction analog-digital can be seen on top of the red DVB-bars. 256 QAM is yellow, 64 QAM is blue.

Cursor 1 is tuned to a 256 QAM DVB-transponder (S2) with 63.4 dB. Cursor 2 is tuned to C68, also 256 QAM with 65.0 dB. The difference between cursor 2 and cursor 1 is 1.6 dB.



TILT Messung				
TV	S 2	1:	63.4dBµV	DIG DVB-C 256QAM
	C 68	2:	65.0dBµV	DIG DVB-C 256QAM
		2-1:	1.6dB	
			23.02.12	16:04:22
PROFIL1	PROFIL2	EINSTELLG.	PEG. ABSE.	ZURÜCK

Our latest engineering project....



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Thanks a lot for your attention!

