ELPAS

KWS ELECTRONIC

HIGH FREQUENCY TEST EQUIPMENT

# Upstream Monitoring System • UMS

# X16/KWS & VAROS 107

Fast internet services, VoIP, online gaming and much more needs a high-quality broadband DOCSIS connection. For reliable operation an interference-free return path is essential.

The combination of a special KWS version of the real time X16 spectrum analyzer from »Kronback Tracers« in the headend and the successful cable handheld VAROS 107 as a field device provides a system that ensures high signal quality in the upstream frequency range.

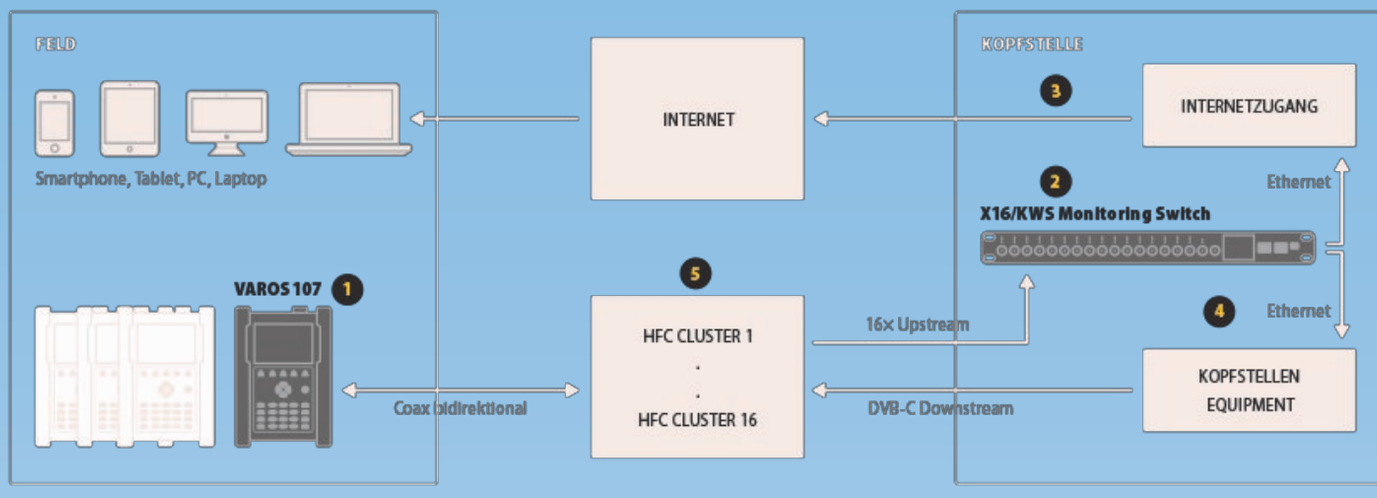
Communication between the field device and headend unit is bi-directional and uses the coaxial and/or HFC network currently being measured. As such, no internet connection is required.

All real time spectral measurement parameters of the headend are displayed on the field device. The 16 inputs of the headend device, ist small size (19"/1 RU), the option to cascade up to 16 such units, and the possibility of measuring with multiple handheld devices simultaneously in the field, provide for sufficient flexibility even in large networks.

Numerous measurement and adjustment aids complete this powerful system.

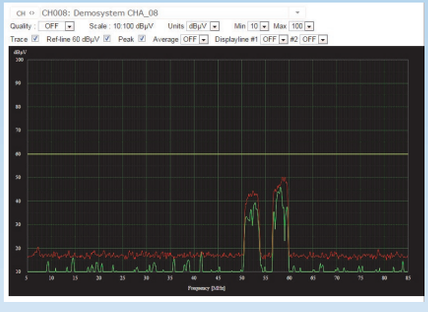
## Key Features

- Real-time Spectrum view with Peak-Hold function
- Waterfall diagram
- Comfortable Line-up for Return Channel Amplifiers
- Frequency Response diagram with sweep function
- Data communication bi-directional over HFC-Network (no additional Internet connection necessary)
- Powerful Webinterface for long-term-monitoring of spectrum data for each single return path cluster
- Long-term recording of Waterfall diagrams for error back tracing



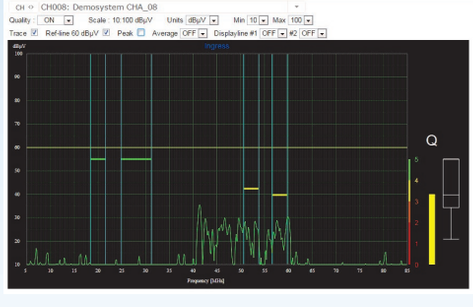

## Block Diagram

1) Field device VAROS 107, data communication bi-directional over HFC-Network (no additional Internet connection necessary)
2) Headend device X16/KWS receives the return path spectrum in the headend for up to 16 clusters
3) Webinterface for spectrum monitoring and long-term recording
4) MPEG-2 data stream Output with all measurement results and telemetry data via Ethernet (UDP/RTP)
5) HFC – Hybrid Fibre Coax network



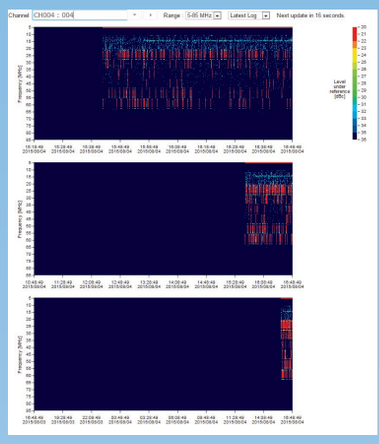
### Webinterface:
### Spectrum analyzer

Cluster selective spectrum analyzer with real-time spectrum, average- and peak-hold-view.



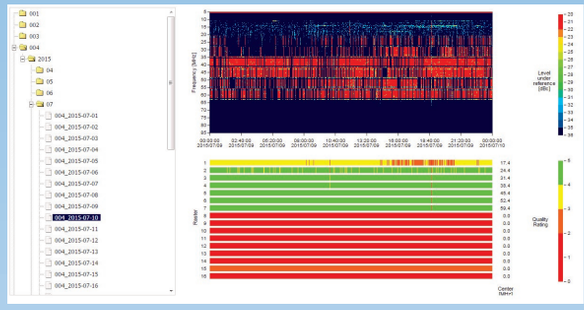
### Webinterface:
### Noise floor in DOCSIS-Upstream channel

Cluster selective analyze of noise floor in active modem-upstream channels.
The noise component will be determined in 5 quality levels and used for long-term recording.



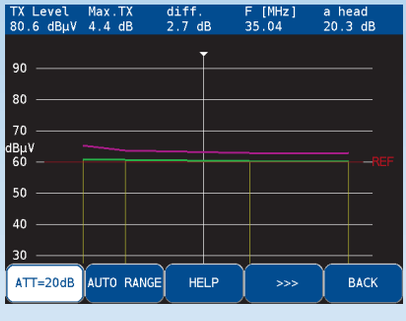
## Webinterface:
## History diagram of the last 24 hours

The activities in each single clusters can be displayed as 1.5h, 6h and 24h waterfall diagram.



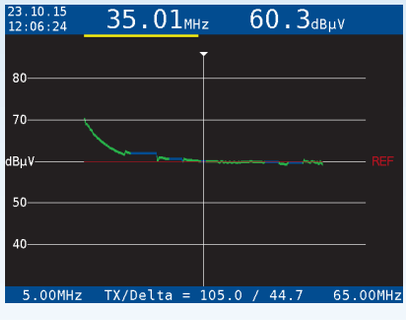
## Webinterface:
## Long-term recording

A 24h waterfall diagram as well as the quality evaluation of the noise floor for each modem-upstream channel are available for each cluster for error back tracing.



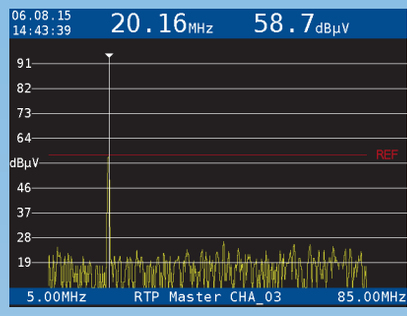

## VAROS 107: Comfortable Line-up assistance for return channel Amplifiers

Line-up of different types of return channel amplifiers with a guided measurement. With this feature an easy and reliable line-up of amplifiers in the house-installation as well as for amplifiers in the line is possible. Also measurements at attenuated test points of amplifiers are possible.



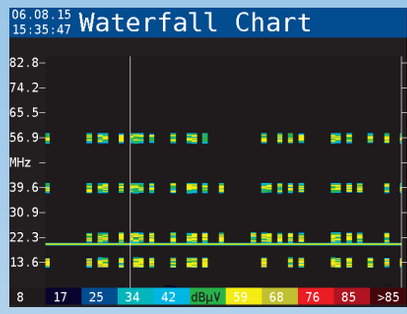

## VAROS 107:
## Sweep function

With the sweep functionality a complete frequency response of the return channel range can be measured.
To allow measurements during active modem communication, DOCSIS upstream channels are skipped while sweeping.




## VAROS 107:
## Real-time spectrum view

The field device shows the received spectrum of the complete return channel range by the headend in real time. A freely moveable cursor and a predefined reference level line (setup in headend device) completes that view.




## VAROS 107:
## Waterfall diagram

The continuously running waterfall diagram is a pseudo 3D view of the received spectrum data. With this view also short ingress and noise can be shown. The view can be shown in two different level-dynamic ranges: one for the full dynamic range, and the other one optimized for modem upstreams.

**Technical data of X16/KWS device**

| | | |
|---|---|---|
| **Connections** | LAN for MPEG2 transport stream | SFP Module for UDP/RTP data stream (data rate < 2 Mbit/s) |
| | LAN for Webinterface | RJ45, 100Base-T |
| | 16 x RF Inputs | 5 - 85 MHz, F-Type, 75 Ohm, AC coupled |
| **Dimensions** | height x length x depth | 44 mm (1 RU) x 482 mm x 210 mm |
| | Weight | tbd. |
| **Power supply** | Supply voltage | 48V DC |
| | Power | < 40 W (tbd.) |
| **Environmental conditions** | Operation temperature | 5°C - 45°C |
| | Storage temperature | -20°C - 55°C |
| | Humidity | 20% to 80% rel. humidity (without condensate) |

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