

# R&S® AdVISE VISUAL INSPECTION SOFTWARE

Now with  
image tracking and  
audio monitoring

A new way to eliminate human inattention



Product Brochure  
Version 05.00

**ROHDE & SCHWARZ**  
Make ideas real



# AT A GLANCE

R&S®AdVICE visual inspection software automates the process of visually monitoring equipment under test (EUT) during a test sequence. This eliminates human inattention, ensures reproducible results and simplifies the test documentation. A typical application is EMS testing with R&S®EMC32 and R&S®ELEKTRA test software.

Visually monitoring an EUT during a complex test sequence is time-consuming and requires utmost concentration. Errors can be overlooked in a momentary lapse of attention. Furthermore, many events cannot be reliably monitored with the naked eye, such as slight changes in color or brightness or deviation from a predefined flashing frequency. This is where R&S®AdVICE software provides support.

R&S®AdVICE uses object based algorithms to analyze the incoming video signal of an HDTV camera attached to a PC. With the aid of parameters defined by the user, the software detects any deviations from the target status of the EUT and documents these deviations in a video protocol and status report. R&S®AdVICE can be connected to system software such as R&S®EMC32 and R&S®ELEKTRA via a remote control interface. The system software controls the test sequence and creates its own report containing the results.

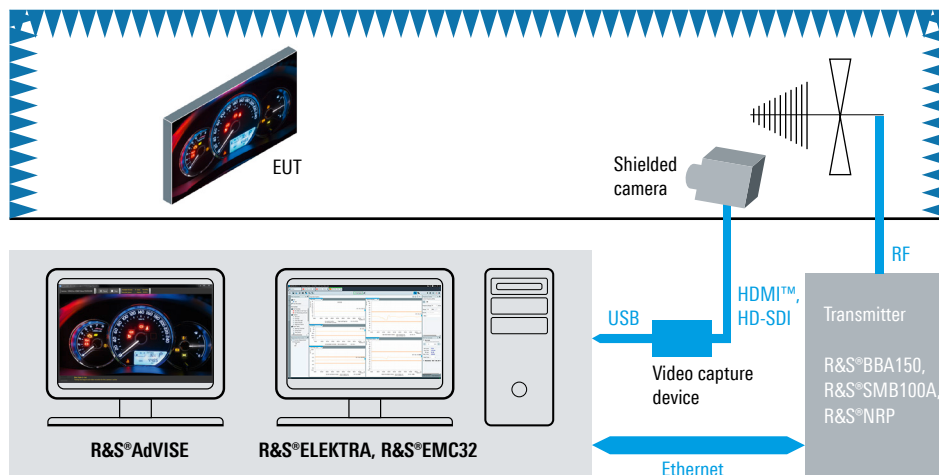
The analysis focuses on regions of interest (ROI). ROIs, drawn by the user, are used to denote the areas of the picture that are to be analyzed and specify which analysis method is to be used. The R&S®AdVICE system analyzes up to 30 video frames per second and can see transitory events that a human may miss.

The intuitive and clearly structured user interface makes it possible to configure measurements in only a few minutes. The operator can intervene at any point during the test sequence to deactivate or adjust individual regions.

## Key facts

- ▶ Automatic error recognition for EUTs based on camera signal evaluation
- ▶ Continuous monitoring of up to 32 regions at 30 frames per second
- ▶ High-performance image processing thanks to object based evaluation with optimized test methods
- ▶ Optional image tracking to compensate for EUT and camera vibrations
- ▶ Creation of event-controlled video protocols and test reports
- ▶ Runs independently and under the control of system software

## R&S®AdVICE in a networked system with EMC control software



# BENEFITS AND KEY FEATURES

## System concept

R&S®AdVICE runs on any controller that fulfills the minimum requirements listed in the specifications. It leaves sufficient processing power to also run control software such as R&S®EMC32 and R&S®ELEKTRA on the same controller.

A special video interface to feed the uncompressed camera signal is not necessary. This is performed by an off-the-shelf portable frame grabber connected to the R&S®AdVICE PC via USB 3.0. All cameras with a conventional DVI, HDMI™ or HD-SDI interface can be connected.

R&S®AdVICE is an efficient solution for monitoring an EUT from different angles. Thanks to the precise configurability of the ROIs, R&S®AdVICE can analyze up to four cameras simultaneously when their output signals are combined by an upstream multiviewer into a single video signal.

## Image tracking

With the image tracking option, R&S®AdVICE automatically adjusts the position of all defined measuring fields to the actual position of the image elements to be evaluated. As a result, R&S®AdVICE visual inspection software can be used even if running motors, shaky turntables or unstable camera suspensions cause the image to vibrate. The option also supports camera repositioning. The measurement configuration can be resumed at the push of a button.

## Virtual camera

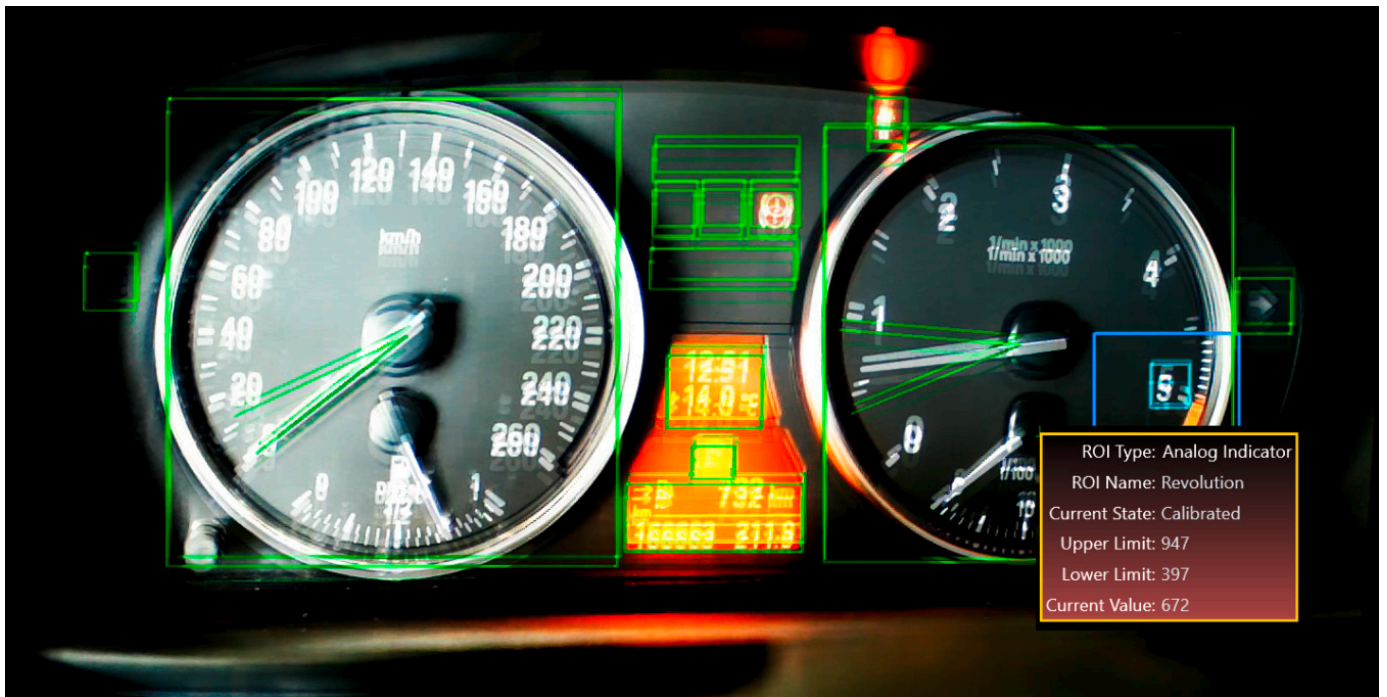
R&S®AdVICE can also analyze video recordings of completed tests with the R&S®ADV-K1050 virtual camera option. Measurements can be configured in the same way as during real-time operation, except that the software analyzes the content of a video file instead of a camera signal.

## Video protocol and test report

R&S®AdVICE creates a video protocol with an event list. What sets the R&S®AdVICE system apart in usability is the indexing feature of the integrated video player. This feature allows the user to go to any event in the video by clicking on the event information. The player enables the user to collect a single frame as a JPEG image or collect a clip of the video to be used for reports or archiving.

The event list can also be saved as a PDF test report.

Image tracking allows EUT monitoring even if vibrations disturb the image recording



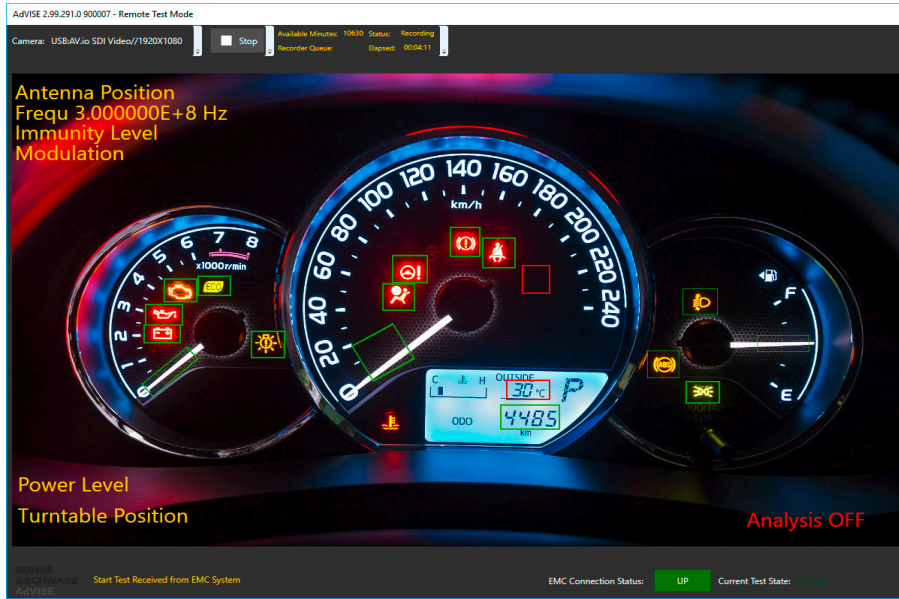
## Remote control

R&S®AdVISE has a generic and an extended remote interface to control test sequences.

The generic interface is open to all users who wish to control R&S®AdVISE via their own remote control program. R&S®AdVISE will pass back to the remote system a Go/NoGo value indicating whether or not an event condition has been detected. The test software can transmit test information to R&S®AdVISE during the test sequence.

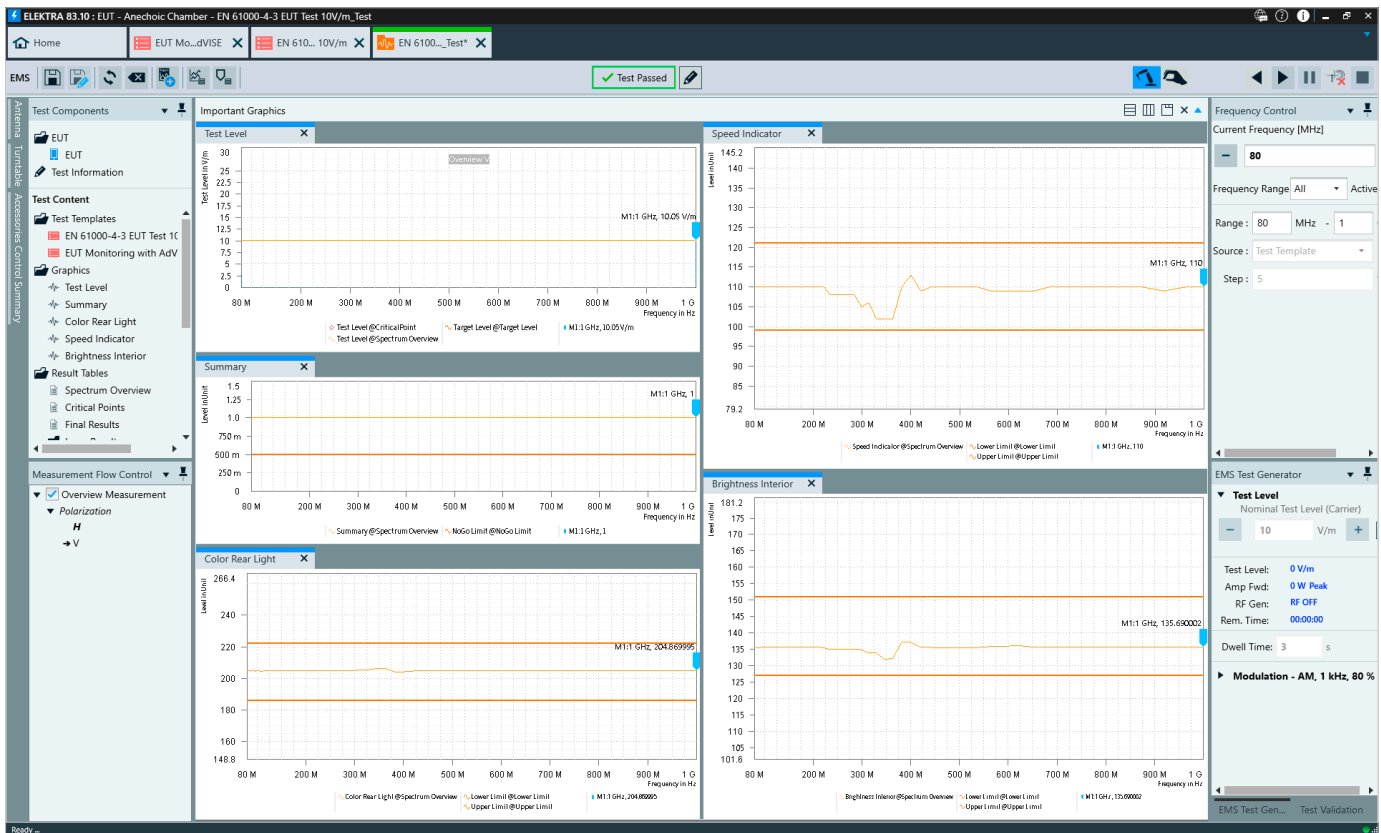
R&S®AdVISE then superimposes this information clearly into the incoming video. This informs the operator of the test's progress while it is running, and makes it easier to assign the event to the corresponding test conditions in the recorded video report.

The extended interface is designed to be used with R&S®EMC32 and R&S®ELEKTRA. This interface also provides the measurement results for individual ROIs for graphical processing in R&S®EMC32 and R&S®ELEKTRA.



Measurement view with superimposed information of the EMS test conditions

## Displaying R&S®AdVISE test results in R&S®ELEKTRA measurement software





# OPTIMAL ANALYSIS EFFICIENCY

Regions of interest (ROI) are the mechanism by which the user defines how to use the R&S®AdVISE system. ROIs are small sections of the video surface that the operator specifies by drawing a rectangular box around the area. The analyzers then focus on the video frame areas defined by the ROIs. This increases the speed at which events are captured and helps ensure real-time processing. The R&S®AdVISE system supports parallel monitoring of up to 32 ROIs (R&S®ADV-K1032 option).

Each ROI that is created is assigned to a specific type of event that the ROI is watching for. These types are described in more detail below.

## Light (on/off)

Light on/off indicates extreme changes in brightness. In other words, a lamp is either on or off. The analyzer will declare an event if a defined area changes from off to on or from on to off. Examples:

- ▶ Headlights
- ▶ Dashboard indicator lights (ABS, engine oil, temperature, warning, etc.)
- ▶ Tail lights
- ▶ Cockpit warning indicators
- ▶ Interior or exterior lighting

## Color change

Color change monitors the color of the observed area. The analyzer will declare an event if the average color of the defined ROI is outside the specified hue range. Example:

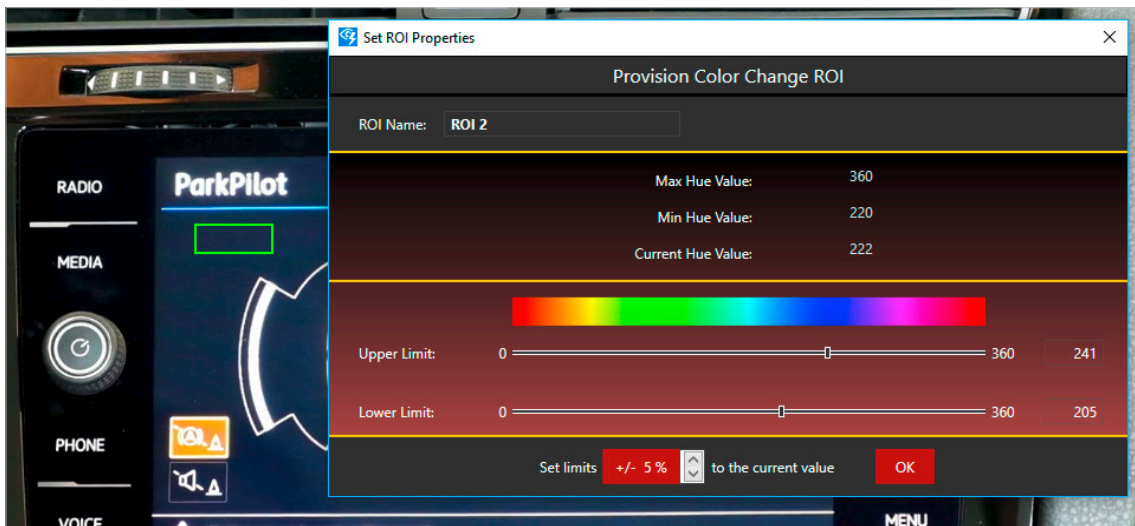
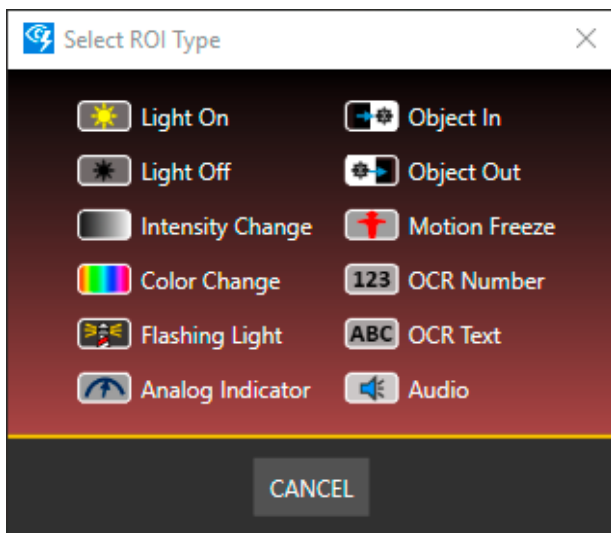
- ▶ Indicator that is normally green but turns to amber or red

## Intensity change

Intensity change monitors the brightness of the observed area. The analyzer will declare an event if the average brightness within the defined ROI is out of the specified luminance range. Examples:

- ▶ Lamps
- ▶ Background illumination

Selecting an ROI type



Checking the background color with "Color Change ROI"

### Motion freeze

Motion freeze monitors whether an element is still moving. The analyzer will declare an event if the element that is monitored with this ROI stops moving for a definable time.

Examples:

- ▶ Activity indicators
- ▶ Mechanical relays
- ▶ Running counters
- ▶ Running engines

### OCR text (R&S®ADV-K1060 option)

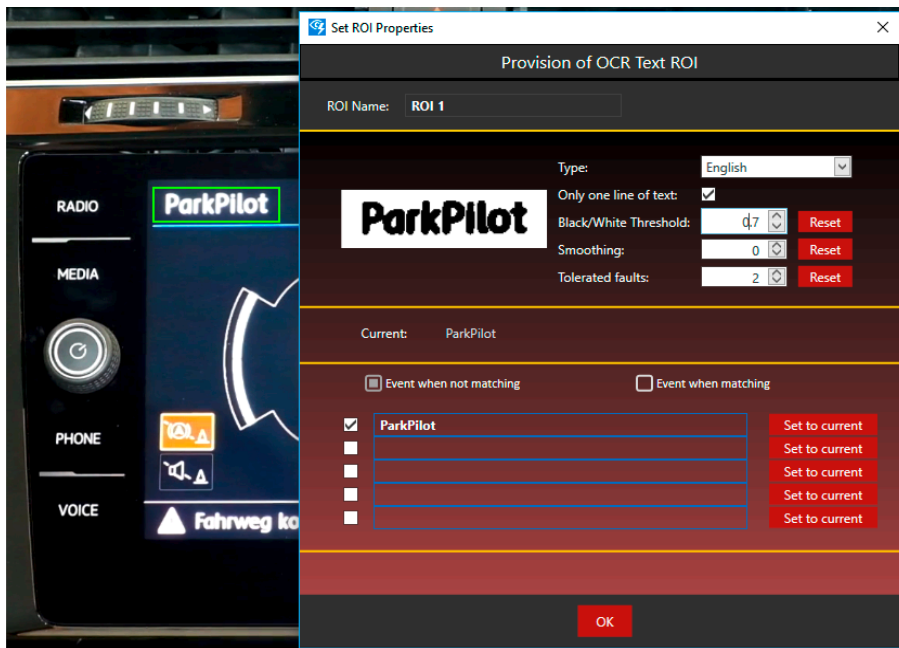
OCR text monitors status information. The user can define up to five status messages and choose whether he receives an alarm if none or alternatively if at least one of these messages appears. Examples:

- ▶ Status messages
- ▶ Warning or alarm information
- ▶ Instrument settings

### OCR number (R&S®ADV-K1060 option)

OCR number monitors numeric outputs. The user can choose to receive an alarm if the test result is within or outside a definable range. Examples:

- ▶ Test results
- ▶ Temperature
- ▶ Filling level



Checking a text information with "OCR Text ROI"



Checking a numerical test result with "OCR Number"

## Object in, object out

Object in and object out indicate any changes within a defined area. This can, for example, be an element that moves into or out of this area. The software also detects changes to the objects themselves. Examples:

- Symbols and icons
- Numbers and font displays
- Indicator positions

## Analog indicator

Analog indicator monitors the position of a pointer or bar indicator. It supports circular and linear gauges. The operator can configure the analyzer to declare an event if the observed indicator is inside or outside of the specified limits. The value of the indicator position is available and can be processed via the remote interface. Examples:

- Circular gauge
- Linear gauge
- Bargraph indicator
- Speedometer
- Revolution counter
- Level indicator

## Flashing lights

Flashing lights monitor the frequency, pulse width and duty cycle of flashing elements, either individually or together. The analyzer will declare an event if at least one of the measured values exceeds the defined limit values.

Examples:

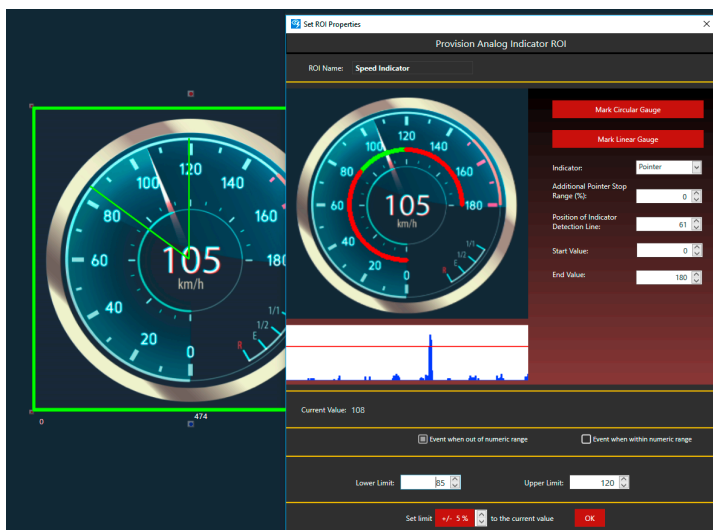
- Turn indicator
- Alarms
- Running lights

## Audio monitoring (R&S®ADV-K1062 option)

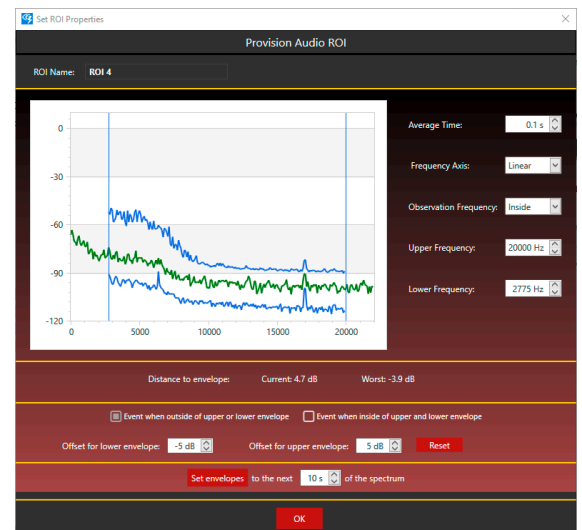
This option permits frequency-selective monitoring of wanted and unwanted noise. The analyzer generates an error message if the signal spectrum in the selected frequency range violates a pre-trained envelope. Audio signals can be recorded via the connected camera or PC audio input. Examples:

- Motor noise
- Fan noise
- Test tone distortions

Checking a mechanical circular gauge with “Analog Indicator ROI”



Checking the audio spectrum for wanted or unwanted noise with “Audio ROI”



# SPECIFICATIONS IN BRIEF

## Specifications in brief

### Base software

|  |   |
|--|---|
| ROI types                              | light on, light off; object in, object out; color change; intensity change; analog indicator; flashing frequency (0.2 Hz to 10 Hz), flashing duty cycle, flashing pulse width (0.1 s to 4.9 s); motion freeze (0.03 s to 3.3 s), optional OCR text, OCR number and audio monitoring |
| Max. number of parallel monitored ROIs | 16 (optional 32)  |
| Video report                           | 1080p30, H.264 coded, file size typically 3 Gbyte/h, max. file size 60 Gbyte, EMS data fields for watermarking: frequency, modulation, immunity level, power level, turntable position  |
| Operation modes                        | local, remote generic, remote extended (compatible with R&S®EMC32 version 10.50.00 or higher and R&S®ELEKTRA version 3.20 or higher)  |
| Video interface for live camera        | USB video class (UVC), USB 3.0; supporting HDMI™ and HD-SDI via video capture device  |
| Supported camera formats               | 1080p30; RGB, 4:2:2, 4:4:4; 8 bit, 10 bit   |
| Depth of analysis                      | 8 bit   |

### Options

|   |  |
|---|--|
| R&S®ADV-K1032 extension to 32 ROI         |  |
| Max. number of parallel monitored ROIs    | 32   |
| R&S®ADV-K1050 virtual camera input option |  |
| File container                            | *.mov, *.mp4, *.avi  |
| Coding                                    | H.264, MPEG-2; MPEG-4  |
| Formats                                   | 1080p30, 1080p60; other resolutions are possible, but are converted in real time to 1080p  |
| R&S®ADV-K1060 ROI OCR text and number     |  |
| OCR text                                  | monitoring a status information  |
| OCR number                                | monitoring a numeric output  |
| R&S®ADV-K1062 audio monitoring            |  |
| Frequency range                           | 50 Hz to 22 kHz (depending on microphone specification)  |
| Level range                               | 0 to -120 dBFS (depending on microphone specification)   |
| Audio interface                           | live audio sources: embedded audio in USB video class (UVC), PC sounds (loopback); virtual camera audio source: MP2, MP3, AAC coding |
| Number of channels                        | 1 (left)   |
| R&S®ADV-K1070 image tracking              |  |
| Number of trackers                        | up to 3  |
| Tracking range                            | 300 × 300 pixel  |

## Hardware recommendations

|   |  |
|---|--|
| Video capture devices                                       | AV.io HD (DVI, HDMI™), AV.io SDI (HD-SDI), <a href="https://www.epiphan.com/products/">https://www.epiphan.com/products/</a> |
| Supported and verified shielded cameras for EMC application | <ul style="list-style-type: none"> <li>► mk-messtechnik GmbH: dAV-Cr-HD</li> <li>► Audio GmbH: HDCam6E, HDCam7</li> </ul>    |

### Minimum controller requirements

|                            |   |
|----------------------------|---|
| CPU                        | 6th generation Intel® Core i7 processor or 4 core Intel® Xeon processor with NVIDIA P2000 |
| RAM                        | 16 Gbyte  |
| Mass storage               | 250 Gbyte hard disk, solid-state disk (SSD) recommended                                   |
| USB, LAN                   | USB 3.0, 100 Mbit LAN interface, 1 Gbit LAN recommended                                   |
| Minimum monitor resolution | 1920 × 1080 pixel   |
| Operating system           | Windows 7/10, 64 bit  |

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# ORDERING INFORMATION

| Designation  | Type          | Order No.    |
|--|---------------|--------------|
| Visual inspection software                             | R&S®AdVISE-SW | 1434.6518.02 |
| License dongle   | R&S®AdVISE-PC | 1434.6660.02 |
| Extension to 32 ROI                                    | R&S®ADV-K1032 | 1434.6524.02 |
| Virtual camera   | R&S®ADV-K1050 | 1434.6530.02 |
| ROI optical character recognition for text and numbers | R&S®ADV-K1060 | 1434.6601.02 |
| Audio monitoring                                       | R&S®ADV-K1062 | 1434.6618.02 |
| Image tracking   | R&S®ADV-K1070 | 1434.6560.02 |

Your local Rohde&Schwarz expert will help you determine the optimum solution for your requirements.  
To find your nearest Rohde&Schwarz representative, visit [www.sales.rohde-schwarz.com](http://www.sales.rohde-schwarz.com)

## Service that adds value

- ▶ Worldwide
- ▶ Local und personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

## Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

## Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001



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