

# ADVANCED REMOTE INTERFACE R&S®ADVISE

## Products:

- ▶ R&S®AdvISE

This application note describes how to use the advanced interface in R&S®AdvISE for remote operation.

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## Note:

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<http://www.rohde-schwarz.com/appnote/1S004>

This document is complemented by software. The software may be updated even if the version of the document remains unchanged



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# 1 Introduction

R&S®AdVISE is a visual inspection software to monitor up to 32 different Regions of Interest in one video for visible and audible change. It can be controlled via a remote-control interface. Although R&S®AdVISE is generally used with an EMS system it can be used by any system that wishes to receive information about a monitored object and control when that information is collected and returned.

If used together with R&S®ELEKTRA or R&S®EMC32, the advanced driver is already implemented in these tools. In that case, no additional information is needed to run the system via remote control. If R&S®AdVISE is supposed to be controlled via any other software, this document provides the information needed to configure the system.

R&S®AdVISE offers two different interfaces to communicate with - a generic and an advanced interface. The generic interface is open for any external control software and passes on a collective information about the state of all ROIs. The advanced interface, described in this document, offers the same possibilities, but in addition presents the individual ROI statuses for processing them in the remote-control software. For information about the generic interface, see "Generic Remote Interface R&S®AdVISE - Application Note".

This application note explains how to set up R&S®AdVISE for remote testing via the advanced interface, and how to set up the remote software at the example of R&S®Forum (chapter 2). The message flow between R&S®AdVISE and a remote system is specified and the most important commands are explained (chapter 3). Specific commands in other EUT monitoring software might differ. Finally, an overview over different commands is given (appendix A) and a R&S®Forum sample script is provided for conducting a remote test using the advanced interface (see appendix B).

## 2 R&S®AdVISE operation under Remote Control

When R&S®AdVISE is used in a remote test, i.e. a test under the control of a remote system, R&S®AdVISE responds only to the commands sent to it by the remote system.

R&S®AdVISE initiates a listen on port 7600 and waits for a connection request from the remote system. R&S®AdVISE will only support a single connection at any one time and is tolerant of systems that use a 'connect' - 'send command' - 'disconnect' behavior as well as system that will connect and hold that connection for the duration of a test.

All messages between the remote system and R&S®AdVISE are sent as UTF-8 type characters or in ASCII format.

When R&S®AdVISE is used in the remote test mode, it is fully under the control of the remote system and will remain so until the remote system sends the "STOPTEST" command. The other way to stop the remote test is pressing the "STOP" button in R&S®AdVISE. If done so, R&S®AdVISE will close the camera window and close the recorder file, but it will **not** inform the remote system.

### 2.1 Software Settings in R&S®AdVISE

#### 2.1.1 Configuring R&S®AdVISE

In addition to the usual configuration as described in the user manual, the following adjustments have to be made to run R&S®AdVISE in remote mode.

1. Go to: Setup → EMC System Options → select R&S EMC Software

2. Go to: Run Test → Remote → select your test → Run Test

3. Adjust EMS Data Fields

Ticking or unticking the different boxes enables the corresponding text fields in the video. Those categories that are unticked won't show up in the video window and won't be burned onto the video during the recording.

4. Click Start test

Now R&S®AdVISE is ready for remote testing.

One can have up to 32 ROI's in a single test and using the advanced interface, which is described here, one can display the results of all the ROI's present in a single query.

## 2.1.2 Status signaling

During remote testing, you can check for proper operation by various visual components:

- ▶ Once a EUT monitoring software establishes a connection to R&S®AdVISE the EMC Connection Status will change from "DOWN" to "UP" (Figure 2-1) and R&S®AdVISE will move to standby state waiting to receive commands (Figure 2-2)
- ▶ Once R&S®AdVISE receives the "Start Test" command it moves to the active test state and starts recording a video (Figure 2-3)
- ▶ EMS information are displayed in the top left corner unless manually moved to another position (Figure 2-4)
- ▶ Each analysis period is indicated by green text "Analysis ON" directly below the EMS information. Otherwise, it states "Analysis OFF" in red (Figure 2-4).



Figure 2-1: EMC Connection Status (left: no TCP/IP connection, right: TCP/IP connection established)



Figure 2-2: Waiting for Start Test command

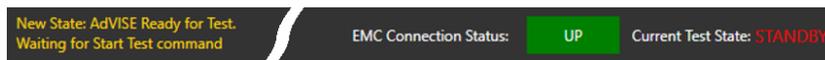


Figure 2-3: Start Test command received



Figure 2-4: Camera view with embedded EMS information and analysis status

## 2.2 Software Settings in R&S®FORUM

The settings shown here are only relevant, if R&S®FORUM is used to establish a connection. Other system requirements may vary.

In R&S®FORUM go to: Settings → Instruments → Add

Add the R&S®AdVISE advanced interface as follows:

Name: AdvISEext  
Interface Type: Socket  
IP Address: IP Address of AdvISE  
Port: 7600

The port of the advanced interface is always set to 7600. That can be looked up by opening R&S®AdVISE and going to

Setup → EMC System Options → Default TCP IP Port

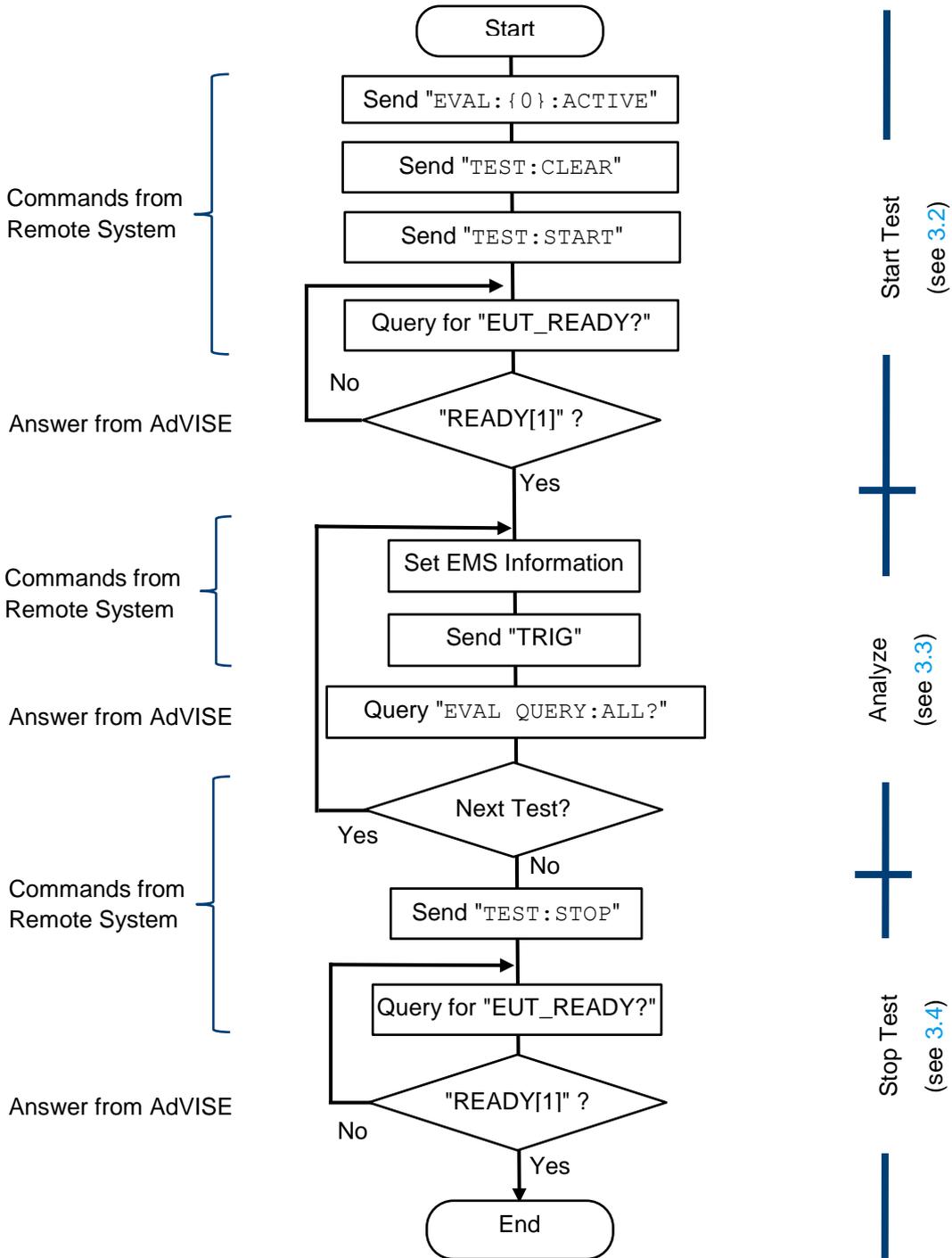
## 3 Procedure: Remote testing

After successfully establishing a TCP/IP connection between R&S®AdVISE and the remote system, this section describes the operation of the advanced interface including message flow, responses and the correct order in which messages must be sent. Only if this order is met, it is ensured, that the results will be as anticipated.

### 3.1 Signal flow

All commands appearing in the diagram are essential to the success of the test. Other additional commands are listed in appendix A.

The flow should be as follows:



## 3.2 Start test

The following commands have to be sent in order to start a test. First the available ROI's are set to the active state and then the test is started.

```
EVAL:{0}:ACTIVE  
  
TEST:START  
do {  
    ready <- EUT_READY?  
} WHILE ready != READY[1]
```

## 3.3 Analyze

After starting a test an arbitrary number of analysis periods can be conducted. In order to do that you should first set EMS information in order to identify the analysis period and secondly measure.

### 3.3.1 Set EMS information

Use the commands given in the EMS information table in the next section in order to set EMS information (see appendix A). They appear in the top left corner of the video and help to identify the analysis period. Per default, the categories `Frequency`, `Immunity level`, `Power level`, `Modulation`, `Antenna Position`, `Turntable position` are given to R&S®AdVISE to be measured and therefore are shown in the test window as well as burnt onto the video. Since the commands for setting EMS information are optional, the names of the categories will be shown if no values are set.

### 3.3.2 Measure

Start an analysis period by sending "TRIG". After some waiting time, query "EVAL\_QUERY:ALL?". R&S®AdVISE returns "ROI 1:133.00|ROI 2:122.18" (example) which shows the ROI output of all the ROIs added in the current test.

## 3.4 Stop test

The following commands have to be sent in order to stop a test and exit the window:

```
TEST:STOP  
TEST:CLOSE
```

# Appendix

## A List of commands

The usage of the following commands is explained in more detail in chapter 3.

### Commands

Command	Description / Example	Response
<b>TEST: CLEAR</b>	Prepares R&S®AdVISE to receive the “Start Test” command 'TEST: CLEAR '	no
<b>EVAL:{0}:ACTIVE</b>	Activates the corresponding ROI 'EVAL: {0} :ACTIVE '	no
<b>EMC_TEST Test</b>	'EMC_TEST Test '	no
<b>TEST:START</b>	Starts recording 'TEST: START '	no
<b>TRIG</b>	Starts an analysis period 'TRIG '	no
<b>TEST:STOP</b>	Stops recording 'TEST: STOP '	no
<b>TEST:CLOSE</b>	Closes the test window in R&S®AdVISE 'TEST: CLOSE '	no

## Queries

Command	Description / Example	Response
<b>EUT_READY?</b>	Checks if the EUT is ready after calling TEST:START The query has to be sent before starting an analysis period 'EUT_READY?'	WAIT[0] or READY[1]
<b>EVAL:LIST?</b>	Displays the list of all ROIs added in the test 'EVAL:LIST?'	ROI 1  ROI 2  ...
<b>EVAL_QUERY:ALL?</b>	Stops an analysis period and reports the result of all ROIs 'EVAL_QUERY:ALL?'	ROI1:<value>  ROI2:<value>
<b>*IDN?</b>	Identifies R&S®AdVISE '*IDN?'	R&S AdVISE, V.X.Y
<b>ERROR?</b>	Checks for any error in the test 'ERROR?'	0, no error or -#, Description
<b>LIMIT:&lt;name&gt;?</b>	Displays the maximum and minimum limits of the ROI specified <name> = name of the ROI as specified in R&S®AdVISE 'LIMIT:<name>?'	LIMIT: <ROI name>: value

## EMS information

The following commands are optional. The names of the categories are given to R&S®AdVISE by default. They will be shown in the camera window by R&S®AdVISE and additionally will be burned onto the video. If commands are set, the corresponding values will be taken by R&S®AdVISE instead of the category names. The values are not interpreted by R&S®AdVISE but simply displayed.

Command	Description	Response
<b>EMC_FREQ</b>	Set test frequency information 'EMC_FREQ 1.000000E+7 Hz'	no
<b>EMC_INFO</b>	Set EMC information in the order LEVEL, POWER, MODULATION, ANTPOSITION, TTPOSITION 'EMC_INFO 9.016E+0V/m, 18.46W, AM 1kHz, 70% Pol=H, Hgt=115cm Pos=1.0deg'	no

## B Sample script

The following R&S®Forum sample script (also downloadable from the R&S website) transmits some EMS information to R&S®AdVISE and performs a remote test with two analysis periods.

Prepare R&S®AdVISE and R&S®Forum as described in chapter 2.

```
AdVISEext.instrument.write_termination = '\n'
AdVISEext.instrument.read_termination = '\n'

ROIs = AdVISEext.query("EVAL:LIST?").split("|")
ROIs.sort()
AdVISEext.write("TEST:CLEAR")
for i in range(len(ROIs)-1):
    AdVISEext.write("EVAL:{0}:ACTIVE".format(ROIs[i]))

#Start a test
AdVISEext.write('TEST:START;')
time.sleep(.2)
_ready = AdVISEext.query('EUT_READY?')
while _ready != 'READY[1]':
    _ready = AdVISEext.query('EUT_READY?')
    time.sleep(0.5)

#set EMS information
AdVISEext.write("EMC_FREQ 1.000000E+7 Hz")
AdVISEext.write("EMC_INFO 9.016E+0V/m,18.46W,AM 1kHz,70%
Pol=H,Hgt=115cm Pos=1.0deg")

time.sleep(2)
AdVISEext.write("TRIG")
time.sleep(.5)
results = AdVISEext.query("EVAL_QUERY:ALL?").split("|")

#End the test
AdVISEext.write('TEST:STOP')
_ready = AdVISEext.query('EUT_READY?')
while _ready != 'READY[1]':
    _ready = AdVISEext.query('EUT_READY?')
    time.sleep(0.5)
```

Example 3-1: R&S®Forum code for remote testing with advanced interface in R&S®AdVISE

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