ROHDE&SCHWARZ

Test and Measurement
Division

Release Notes

Firmware
R&S® UPV/UPV66
Version 2.1.1

Printed in the Federal Republic of Germany

Dear Customer,

throughout this manual, UPV is generally used as an abbreviation for the Audio Analyzer R&S® UPV.

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1 General Information

This UPV firmware revision consists of one file

Setup_211261Release.msi

This firmware can be installed on UPV or UPV66.

Please ensure that this file is available on the UPV, either on a USB stick, on a CD or on a network directory that can be accessed by the UPV.

It is recommended to copy the file to the folder D:\R&S_Software\Firmware on the UPV's hard disk.

2 Firmware Upgrade

For any upgrade from a version 1.x to a version higher than 2.0.0 the upgrade to version 2.0.0 is required before. For this purpose a bootable CD "UPV Audio Analyzer Firmware Upgrade 2.0.0" is provided, which is included in the "UPV Firmware Version 2.0.0 Installation Manual", ident number 1406.0154.42.

Please contact your local R&S agency to receive the Installation Manual and the CD-ROM free of charge.

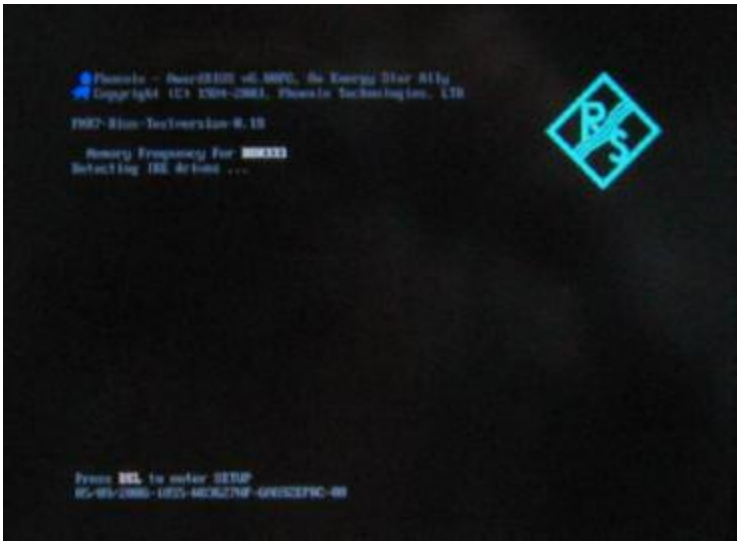
Switch on UPV, connect mouse to UPV, close UPV application

Install UPV firmware by running the file Setup_211261Release.msi in the folder D:\R&S_Software\Firmware

Follow the instructions on screen

The instrument reboots automatically.

During reboot – when the BIOS starts as shown in the figure below – switch UPV off and on again.

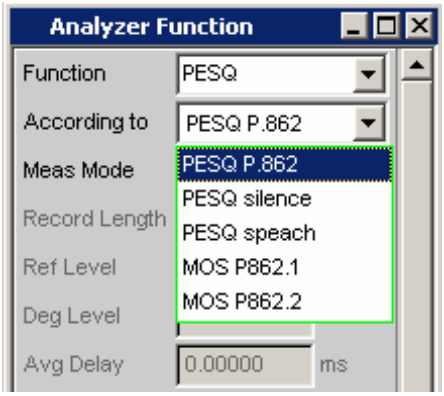
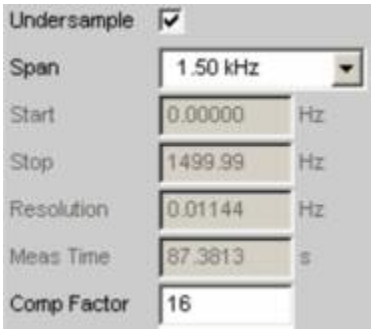


3 New Features

Version 2.1.1

No new features compared to version 2.1.0.260
The list of remote commands "UPV_Remote_Commands_V210260.pdf" is still valid

Version 2.1.0

Analyzer/Generator
Speech quality measurement PESQ according to ITU-T recommendation P.862 is now available with software option UPV-K61.    The Numeric Display shows the MOS value. The average delay is displayed in the analyzer function panel. A new display panel PESQ Graph is available showing MOS and delay versus time. PESQ is a single channel measurement available in analog domain only. Analog analyzer must be set to Channel 1 or 2 and to a fixed level range. Analog generator function Play is used to provide the reference signal for the device under test.
Analyzer function FFT provides new feature "Undersample FFT". FFT resolution is improved while reducing the measurement bandwidth. The maximum undersampling factor is 1024 (selectable steps are 2, 4, 8, 16, …). Option UPV-K6 is required to activate this feature.    Remote control commands: SENSe[1]:FUNCtion:FFT:USAMple ON|OFF

SENSe[1]:FUNCtion:FFT:CMPFactor <n>

To get the best undersample FFT resolution, it is recommended to use the lowest analog analyzer bandwidth and the longest FFT size before invoking the undersample FFT feature. For analog analyzer 22 kHz, using an FFT size of 256 k, the highest undersample FFT resolution is 0.18 mHz in a bandwidth from 0 Hz to 23 Hz.

To measure those very low frequency signals the analog analyzer must be set to DC coupling and to a fixed level range.

Not available for 250 kHz bandwidth analog analyzer.

Maximum sample rate for digital analyzers is limited by the number of filters used. Sample rates up to 96 kHz are fully supported without any restrictions.

The results for Input Peak, RMS, Frequency and Phase are calculated simultaneously.

When "Undersample FFT" is used, Waveform function is switched on with the settings:
Meas Mode: Undersampling
Trigger Source: Manual
Compression factor: according to FFT undersampling factor

Generator minimum sine wave frequency is reduced to 10 mHz (up to now 100 mHz)

Option UPV-K6 is required to activate this feature.

C weighting filter available for analyzer and generator.

Remote control commands:
Pre-Filter "INPut:FILTer CWE"
Function Filter "SENSe[1]:FILTer CWE"
Generator Filter "SOURce:FILTer CWE"

THD+N and SINAD measurement:

Level measurement of fundamental frequency has changed:
Up to now: Level of fundamental frequency was measured after the function filter(s)
From now on: Level of fundamental frequency is measured before the function filter(s)
Without pre-filter this reading is compatible to UPD/UPL.

Level of THD+N signal is measured after the function filter(s)

Pre-filter is always applied to both fundamental and THD+N level measurement.

Generator Signal DIM available in digital domain, too.

Graphics

Multi-scan is switched on in the sweep config panel if a z-sweep is used in the generator.

Remote Control

When a continuous sweep was started, up to now OPC was not generated, because a continuous sweep never terminates. Now OPC is generated when the sweep reaches the stop value for the first time.

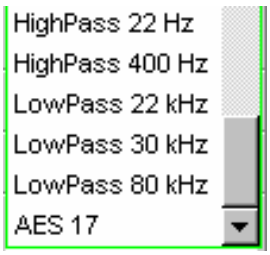
If a z-sweep is active, OPC is sent when the z-sweep terminates.

(now compatible to UPL)

Version 2.0.1

UPV66 is supported with this version
No changes for UPV compared to version 2.0.0.226
The list of remote commands “UPV_Remote_Commands_V200226.pdf” is still valid

Version 2.0.0

Analyzer/Generator
Peak and Quasi-Peak measurement: Minimum Interval time was reduced from 20 ms to 1 ms
Analyzer function DIM measurement available in digital domain, too.
Analyzer function DIM measurement in analog domain now possible without option UPV-B3 installed.
New DIM signal and (automatic) DIM measurement mode: 2.96 kHz square with 8 kHz sine. Remote control command for generator: “SOURce:DIM DIMS”
New Waveform Trigger Source Gen Burst. Using this trigger mode, together with a sine burst generator signal, Delay Measurement is now possible for analog-digital, digital-analog, digital-digital and analog-analog devices under test. The start of the generator burst starts the waveform recording. In the waveform display, the time between zero and the start of the burst is the delay of the device under test. This measurement is not possible, when: - Low distortion generator is switched on - Analog analyzer bandwidth is set to 250 kHz Remote control command “SENSe7:TRIGger:SOURce GENBurst”
Additional Highpass and Lowpass Filters implemented  -3 dB @ 22.4 Hz (3rd order Butterworth) -3 dB @ 400 Hz (3rd order Butterworth) -3 dB @ 22.4 kHz (4th order Butterworth) -3 dB @ 30 kHz (3rd order Butterworth) -3 dB @ 80 kHz (3rd order Butterworth) +/- 0.1 dB to 20 kHz, < - 60 dB from 24 kHz, compliant to AES17
Analyzer Start Condition Delay was extended to 5 s (limited to 2 s up to now). If delay is longer than 2 seconds, after any change in instrument settings, measurement does not automatically restart, but has to be restarted via Start or Single key.

Remote Control
New remote control command "INITiate:CONTinuous WAIT" When reading results in the mode "init:cont on" the UPV didn't block the bus until a new result was available but returned the old one.

This new command works like "init cont on", but now the bus is blocked until a new result is available.
To avoid a "forever" blocking time, a command for defining a timeout was added:
"INITiate:CONTinuous:TIMeout <nu>", where <nu> is in the range of 0s to 1000s.
When the defined time out is elapsed without having a new result, the UPV will return the previous one. If <nu> is set to 0s, "init:cont wait" is identical to "init:cont on".

Remote control commands to read back the error flags, which are generated by digital audio protocol analysis:

SENSe8:PROTocol:ERRor?

Returns the state of all error flags

0,"No error"
or
<n>,"PCM1,PCM2,PAR1,PAR2,…"

<n> is a 10 Bit Integer (decimal value range is 0 to 1023),
errors are indicated by bits d0 to d9:
0 indicates no error
1 indicates error

d0: PCM1	not PCM coded
d1: PCM2	
d2: PAR1	Parity error
d3: PAR2	
d4: LOC1	Lock error
d5: LOC2	
d6: CRC1	CRC error
d7: CRC2	
d8: INV1	Validity error
d9: INV2	

The string "PCM1,PCM2,PAR1,PAR2,…" only contains flags indicating an error

The following commands can be used to query a particular error flag:

SENSe8:PROTocol:ERRor:PCM<i>?

SENSe8:PROTocol:ERRor:PAR<i>?

SENSe8:PROTocol:ERRor:LOC<i>?

SENSe8:PROTocol:ERRor:CRC<i>?

SENSe8:PROTocol:ERRor:INV<i>?

<i> = 1 or 2 for Channel 1 or 2

Return value is
"0" = no error
or

"1" = error

Remote control commands for Normalize:

DISPlay:*Subsys*<i>:A|B:NORMalize OFF | VALue | OCURsor | XCURsor

DISPlay:*Subsys*<i>:A|B:NORMalize:VALue <nu>

Subsys = SWEep | BARgraph | FFT

Graphics
Digital Analyzer: Maximum range of level reference value was increased from 40 dBFS to 80 dBFS for Function Config (different values for both channels possible), Input Config and Level Monitor Config.
New Y-Source “FFT Phase Ch2 – Ch1” selectable for FFT Graph Displays: Shows the Phase difference between FFT spectra of Channel 1 and 2.

General

New file format *.SAC to store/load the instrument state. If this file extension (instead of *.SET) is used, only the hardware settings of the instrument are stored, the panel settings are not stored. When loading such a file, just the hardware settings are restored, the actual panel settings keep unchanged. This new feature can be used to load the same hardware settings into different configurations of the user interface.

Quick Launch Buttons

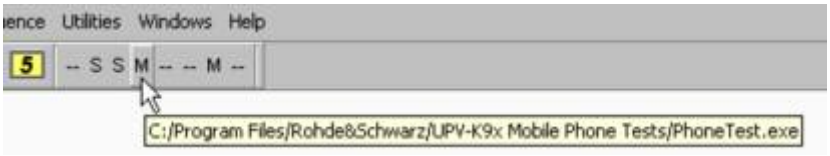
The new Quick Launch Buttons 

are integrated in the UPV Toolbar…

… just with one mouse click you can load an instrument setup or start an executable macro file.

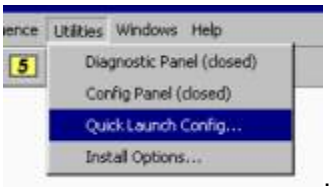
Setups are marked with S

Macros are marked with M

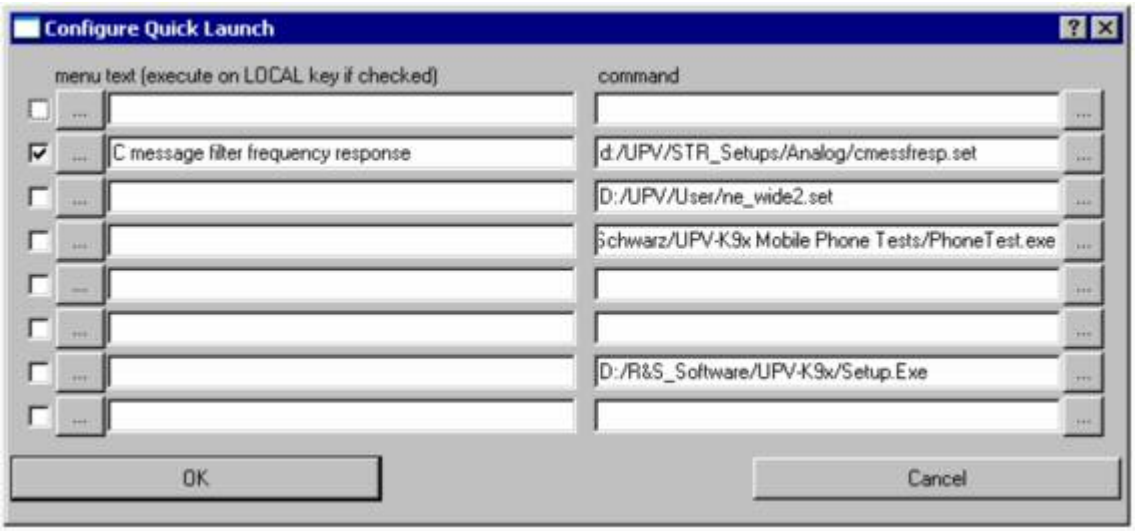


If you click on an empty (--) quick launch button, a browser window opens, where you can select a setup file (*.set) or an executable macro file (*.exe)

Use the **Quick Launch Configure Panel** for further configuration



… opens the Quick Launch Configure Panel …



You can edit and delete menu text and command

If the command is deleted the button becomes empty again

If a command line is checked, it will be executed when the front panel LOCAL key is pressed.

Improvements when operating the UPV with external keyboard and mouse:

1. Numeric entry fields now accept unit abbreviations on the external keyboard

n or N	nV
u or U	µs, µV, µW
m or M	ms, mV, mW
k or K	kHz, kV
h or H	Hz
v or V	V
w or W	W
s or S	s

2. After you have made a numeric entry, without pressing the Enter key, and then click on another field, the just-entered value is taken as entry (up to now the just-entered new value was rejected and the old one was still valid).

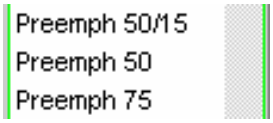
Version 1.4.0

Analyzer/Generator

Digital Audio Analyzer and IIS Analyzer: Automatic detection of input sample rate implemented

Digital Audio Analyzer: Sample rate can be set according to channel status data

Preemphasis filters now available:



All functions of External Sweep now implemented (up to now only Auto, Time Chart and Time Tick available), via Start Conditions:

Freq Ch1
Freq Ch2
Freq Fast Ch1
Freq Fast Ch2
Volt Ch1
Volt Ch2
Lev Trig Ch1
Lev Trig Ch2
Edge Trig Ch1
Edge Trig Ch2

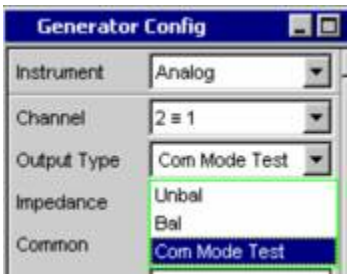
Time Tick: Time ticks are ignored, if they occur while the measurement has not yet terminated.

Analyzer function RMS selective: Sweep Control = Auto List now implemented

Generator Function “Play + Analyzer”: The input signal of the analyzer is routed internally to the generator. A *.wav file can be added (this function is intended to be used for mobile phone measurements).

Amplitude Variation implemented for generator functions Multisine, Arbitrary, Random and Play (this feature is intended to be used for mobile phone measurements).

New Generator Output Type “Com Mode Test” to provide a common mode test signal. Same Signal at pins 2 and 3 of XLR connector.



Remote control command: OUTPut:TYPE CTESt

New Generator Instrument: “Digital Impairment”

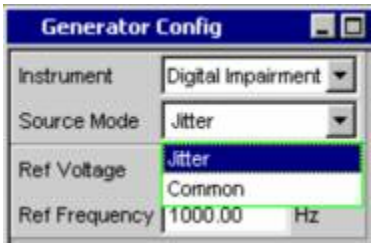
Up to now in the Digital Audio Generator config panel the combo box “Source Mode”

was used to switch between Audio Data and Impairments (Jitter only or Common only).

From now on Audio Data and Impairments are generated simultaneously and the above selection is replaced by the check box “Add Impairment” switching the impairments on or off in the Digital Audio Instrument.

Remote control command: SOURce:IMPairment ON | OFF

The Impairments can be configured in the new instrument



Remote control command: INSTrument[1][:SELect] IMPairment

This instrument is used to select the kind of impairment - jitter or a common mode signal - which can be added to the output signal of the Digital Audio Generator. Impairment parameters are then set in the Generator Function Panel in the same way as before.

New analyzer function “Rub&Buzz” (implemented in normal mode without polarity measurement)

Settling modes exponential, flat and average implemented for analyzer function, frequency and phase measurement

Remote Control

When setting the GPIB address in the config panel the total UPV instrument state is saved including the new address. Thus the UPV no longer “forgets” the new address when not shut down but switched off.

Length of strings no longer restricted to 450 characters

Remote control commands for Printer configuration:

Source

HCOPy:SOURce WINDow | GRAPhics

Destination

HCOPy:DESTination PRINter | FILE | CLIPboard

Orientation (printer only)

HCOPy:PRINter:ORIentation PORTrait | LANDscape

Store Mode (file only)

HCOPy:FILE:MODe NEW | OVERwrite | INCRement

Filename (store mode overwrite and increment only)

HCOPy:FILE 'name'

Header/Footer (printer only)

HCOPy:PRINter:ADDition OFF | ON

Define Text of Header (printer only)

HCOPy:PRINter:HEADer 'text'

Define Text of Footer (printer only)

HCOPy:PRINter:FOOTer 'text'

Start Hardcopy

HCOPy[:IMMediate]

Trace data can be sent to the UPV and are then displayed in the relevant Display Panel

TRACe:SWEep<i>:STORe:AX <Data>

TRACe:SWEep<i>:STORe:BX <Data>

TRACe:*Subsys*<i>:STORe:AY <Data>

TRACe:*Subsys*<i>:STORe:BY <Data>

Data are float numbers without units separated by comma: `<Data> = n,n,n,n`

Subsys = SWEep | BARgraph | FFT | WAVeform

X-axis data are allowed for Sweep Graph Display only. X-Source must be set to “Manual” in the Sweep Graph Config Panel.

Remote control commands to scale graphics (in display config panels)

DISPlay:*Subsys*<i>:A|B:SPACing LINear | LOGarithmic
DISPlay:*Subsys*<i>:A|B:TOP <nu>
DISPlay:*Subsys*<i>:A|B:BOTTom <nu>
DISPlay:*Subsys*<i>:X:SCALing AUTo | MANual
DISPlay:*Subsys*<i>:X:SPACing LINear | LOGarithmic
DISPlay:*Subsys*<i>:X:LEFT <nu>
DISPlay:*Subsys*<i>:X:RIGHt <nu>

Subsys = SWEep | BARgraph | FFT | WAVeform

Remote control commands to set units (in display config panels)

DISPlay:*Subsys*<i>:A|B:UNIT:TRACk ON | OFF
DISPlay:*Subsys*<i>:A|B|X:UNIT <u>
DISPlay:*Subsys*<i>:A|B|X:UNIT:AUTo ON | OFF
DISPlay:*Subsys*<i>:A|B|X:UNIT:USER 'string'

Subsys = SWEep | BARgraph | FFT | WAVeform

Remote control commands to handle limit lines (in display config panels)

DISPlay:*Subsys*<i>:A|B:LIMUpper|LIMLower ON | OFF
DISPlay:*Subsys*<i>:A|B:LIMUpper|LIMLower:SOURce VALue | HOLD | FILE | IFILe
DISPlay:*Subsys*<i>:A|B:LIMUpper|LIMLower:SOURce:VALue <nu>
DISPlay:*Subsys*<i>:A|B:LIMUpper|LIMLower:SOURce:FILE 'filename'

DISPlay: *Subsys*:TRACk:LIMit ON | OFF

DISPlay:*Subsys*<i>:A|B:LIMShift ON | OFF
DISPlay:*Subsys*<i>:A|B:LIMShift:PARallel <nu>
DISPlay:*Subsys*<i>:A|B:LIMShift:SYMMetrical <nu>

Subsys = SWEep | BARgraph | FFT | WAVeform

Remote control commands to move cursors

DISPlay:*Subsys*<i>:OCURsor:SETTo:MAX | MIN | MRKA | MRKB
DISPlay:*Subsys*<i>:XCURsor:SETTo:MAX | MIN | MRKA | MRKB

Subsys = SWEep | BARgraph | FFT | WAVeform

DISPlay:*Subsys*:OCURsor:SETTo:XPOS <nu>
DISPlay:*Subsys*:XCURsor:SETTo:XPOS <nu>

Subsys = SWEep | FFT | WAVeform

Remote control commands to move markers

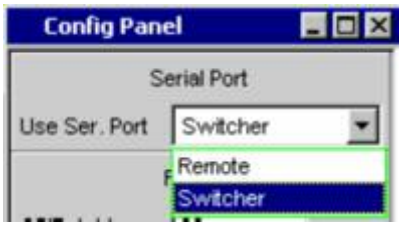
DISPlay:*Subsys*<i>:A|B:MARKer:MODE OFF | FIXed | TRKMax
DISPlay:*Subsys*<i>:A|B:MARKer:HARMonics ON | OFF
DISPlay:*Subsys*<i>:A|B:MARKer:SETTo:OCURsor
DISPlay:*Subsys*<i>:A|B:MARKer:SETTo:XCURsor
DISPlay:*Subsys*<i>:A|B:MARKer:SETTo:XPOS <nu>

Subsys = *SWEep* | *FFT* | *WAVeform*

General

Setups with long FFTs or Waveforms are now loading much faster than before

Now it can be selected in the Config Panel if the COM Interface is used for Remote or Switcher Control. A new selection is valid after reststart of UPV application.



Advantage: Use of COM Interface is no longer automatically switched to Remote Control, if UPV application is started while Switcher operation is set to off in Switcher Control Panel.

Version 1.3.0

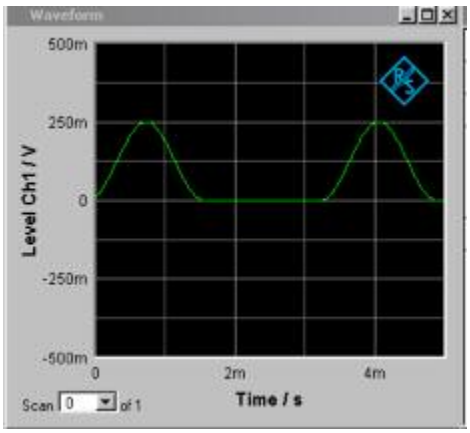
Analyzer/Generator

External analyzer sweep with fast frequency trigger and voltage trigger now implemented. Selectabe via Start Conditions Freq Fast Ch1/2 and Volt Ch1/2. This feature can be used in parallel with generator sweep.

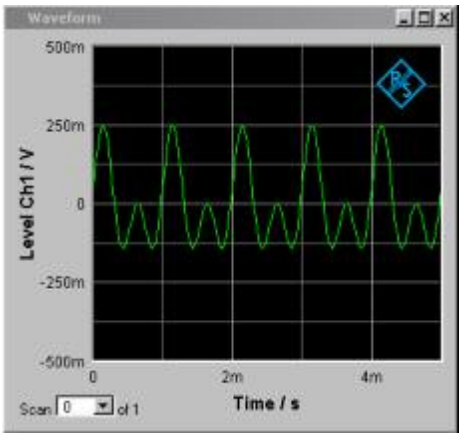
New analyzer function: FFT based 1/n octave analysis. Selectivity can be set to 1, 1/3, 1/6, 1/12, 1/24 octave and to critical bands.

New Polarity Test Signal: Sine squared burst was replaced by two combined sinewaves. Advantage: New signal needs less bandwidth and has no DC component. Frequency can be selected.

Old signal: Sine squared burst

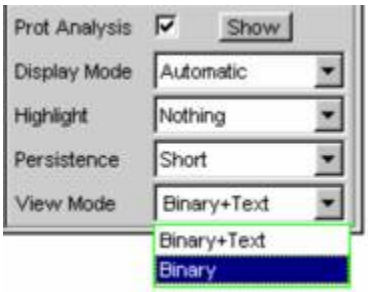


New signal: Two combined sinewaves



Digital analyzer: RMS selective now provides one additional Filter

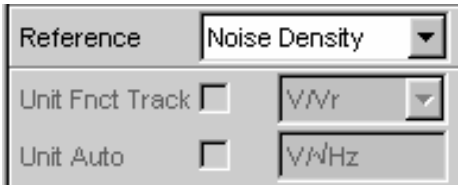
Channel Status Data can now be displayed binary only (without text)



Graphics

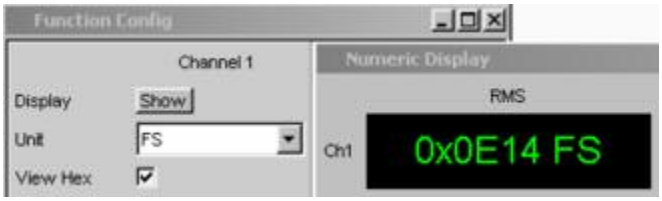
Noise density display available for FFT Graph1 and 2

Select Reference = Noise Density in the FFT Graph Config Panel



The level of each FFT bin is now rescaled to a bandwidth of 1 Hz, thus displaying the power density. The unit is fixed to V/sqrt(Hz). Noise Density Calculation is available for Analog Analyzer FFT Level only

HEX display for Digital Analyzer: Any level measurement result using the unit FS can now be displayed in Hexadecimal format



Trace data can be stored filtered according to the selection made in the Data List.

1. Make the selection in the Data List:

2. Store the selected data in the relevant Display Config Panel as *.trc file

Auxiliaries Panel

The signal at the Anlg Aux Output (BNC connector at the rear panel) can be set to a DC Voltage or can follow Channel 1 of the Signal Source selected for the Audio Monitor: Input, Function or Generator. Up to now only Generator was possible.

Remote Control

Status reporting system now supports the following bits:

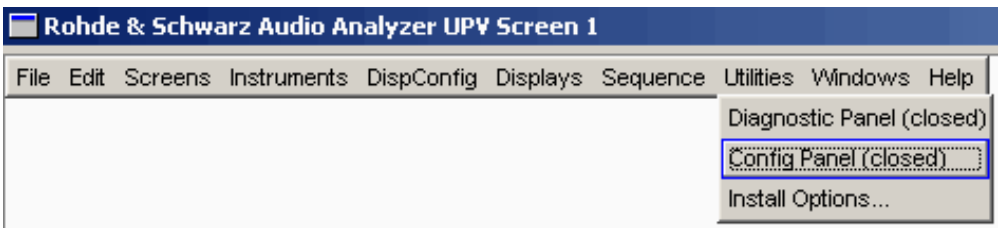
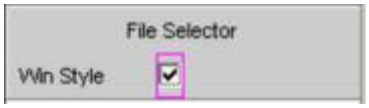
“Run executable” indicates that an executable file was started and is still running.

“Hardcopy in progress” indicates that a hardcopy was started and is not yet finished.

Version 1.2.2

Analyzer/Generator
Digital Audio Protocol Analysis and Generation available, with option UPV-K21 installed See below for remote control commands
Pretrigger implemented for Analyzer Functions Record and Waveform
Function Waveform: Measurement Modes Compressed and Undersample implemented
Generator Dwell Sweep can now be used with analyzer function Record: useful for recording test signals swept over frequency and/or voltage with a fixed time step

Graphics
Graphic Displays can now be opened from the Analyzer Function Panel using the new 'Show' Buttons 

General
File Selector can be switched from R&S style to Windows style … open config panel …  … make the following selection 
New Function 'Execute Macro' starts an executable file *.exe Can be invoked via Menu -> Sequence -> Execute Macro -> file selector

or via Diagnostic Panel -> Exec Macro -> direct entry of filename

GPIB command: SYSTem:PROGramm:EXECute 'filename'

Remote Control

GPIB commands for Generator Function Play implemented

Bandwidth Play Auto	OUTPut:BANDwidth:MODE AUTo
Function	SOURce:FUNCtion PLAY
Shape File	MMEMory:LOAD:ARBitrary 'filename'
Scale Pk to Fs	SOURce:PLAY:SCALepktofs ON | OFF
Channel	SOURce:PLAY:CHANnel MLEFt | MRIGht | STEReo
Play Mode	SOURce:PLAY:MODE TOCont | TOSingle | TICont | TISingle
Time:	SOURce:PLAY:TIME <nu>

GPIB commands for Protocol Data Generator

SOURce:PROTocol:MODE AUTomatic | PROFessional | CONSumer
SOURce:PROTocol:CRC ON | OFF
SOURce:PROTocol:VALidity NONE | CH1And2
SOURce:PROTocol:AZERo ONCE

Direct setting the value of a byte in a channel
SOURce:PROTocol:CH<x>:BYTE<y> <n>
<x> = Channel 1 or 2
<y> = Byte 0 … 3
<n> = Value 0 … 255

Numeric Byte entry :
SOURce:PROTocol:NUMerical:CH <n> , with <n> = 1 or 2
SOURce:PROTocol:NUMerical:BYTe <n> , with <n> = 0 … 3
SOURce:PROTocol:NUMerical:VALue <n>, with <n> = 0 … 255

Track or Split Channels:
SOURce:PROTocol:CHANnels CH2Is1 | SPLit

GPIB commands for Protocol Data Analyzer

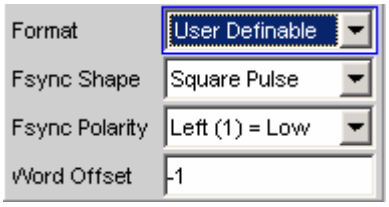
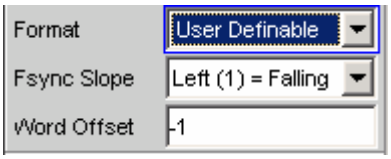
Switch on/off Protocol Analysis function and display: SENSe8:FUNCtion ON | OFF SENSe8:PROTocol:DISPlay ON | OFF *Read out of Byte value:* SENSe8:PROTocol:CH<x>:BYTE<y>? <x> = Channel 1 or 2 <y> = Byte 0 … 4 Return value = 0 … 255 *Select display mode:* SENSe8:PROTocol:MODE AUTomatic | CONSumer | PROFessional *Highlight changes:* SENSe8:PROTocol:HIGHlight NOTHing | FOUTput | BETWeen | FSTart SENSe8:PROTocol:PERSistence SHORt | LONG | FOREver

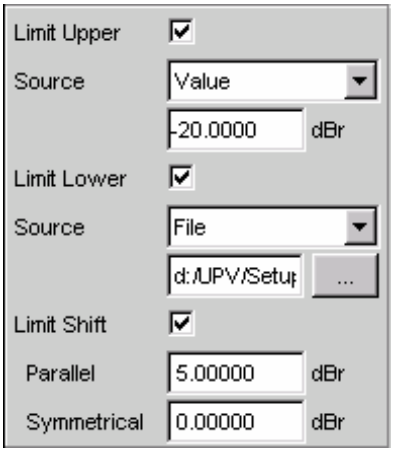
Version 1.2.1

Analyzer/Generator
Burst Signals (Sine Burst, Sine² Burst) now restarts whenever a new measurement is triggered.

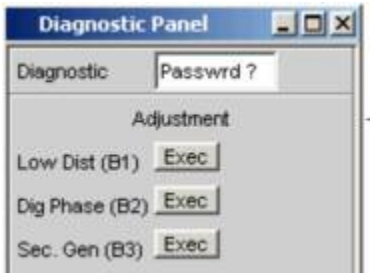
Version 1.2.0

Analyzer/Generator
S/N sequence implemented for RMS, Peak and Quasi Peak measurements. S/N can be selected as new measurement function, the detector (RMS, Peak or Quasi Peak) is then selected as Meas Mode within the S/N function. In addition S/N can be selected as “S/N sequence” within the selected measurement functions RMS, Peak and Quasi Peak.
New high pass filter 22 Hz implemented, which is selected by default when invoking the S/N measurement function
Waveform is now triggered
Group delay measurement implemented
Phase measurement format infinite phase implemented
New analyzer function Record to *.WAV

Analyzer Start Conditions Time Tick and Time Chart implemented
Analyzer function Polarity now implemented
Equalization for analyzer FFT and FFT-based measurement functions implemented.
FFT averaging modes exponential and normal implemented
Measurement speed improved for Distortion measurements at low frequencies
Measurement speed improved for RMS selective measurements at low frequencies
New generator function Play *.WAV
New analog generator bandwidth “Play Auto”. This selection restricts the generator functions to “Play” only. The sample rate the WAV file was recorded with is then used to clock the generator, e.g. useful for files recorded with 44.1 kHz.
Generator DC offset voltage range extended to -10 V to + 10 V for balanced outputs
Equalization for generator signals implemented (UPL file format is still supported)
Generator sweep: Next step = Dwell Value implemented
Extended functions for I2S instrument: New format = “User Definable” Generator  Analyzer 

Graphics
Limit check now supports the use of limit files.
New feature Limit Shift:  Limit lines defined by value or file can be shifted in parallel or symmetrically along the Y-Axis. This can be used to adjust the desired tolerance scheme loaded from limit files.
Trace files can now be stored as equalization files and as limit files, too.
Normalize now implemented for Reference = Gen Track and Reference = File. In case of

Reference = Gen Track, graphics is updated during running sweep only.

General
New Printer (H Copy) control  Source: UPV window (screen) or active graphic window Destination: Printer, File or Clipboard Vector format available for printer only, *.EMF for file or clipboard not yet supported.
Control of Audio Monitor in Auxiliaries Panel modified:  Audio Monitor check box switches on/off, what is pre-selected in the two lines below. If speaker or phone state is changed to enable, audio monitor is switched on automatically.
Adjustment routines which automatically calculate the correction factors for hardware options UPV-B1, -B2 and -B3 now available. 
Fileselector now able to position cursor with mouse. DEL key supported.
Hardware code, serial number and product index in board eeprom can be indicated and changed via diagnostic panel (manual or remote operation). Access to full diagnostic panel is

necessary (for service purposes only).

Remote Control
New command: “init:force stop” terminates a continuous measurement (“init:cont on”)
GPIB command for scan selection implemented  DISPlay:SWE<i>:SCANoffset <n> i = 1, 2, 3, 4 n = 2 | MAXimum, 1 | MINimum , 0 to -19 DISPlay:FFT<i>:SCANoffset <n> i = 1, 2 n = 2 | MAXimum, 1 | MINimum , 0 DISPlay:MONitor:SCANoffset <n> n = 2 | MAXimum, 1 | MINimum , 0 to -19 DISPlay:WAVeform:SCANoffset 0 DISPlay:BARgraph<i>:SCANoffset <n> i = 1, 2 n = 2 | MAXimum, 1 | MINimum , 0 Note: Query always returns numbers (MAX = 2, MIN = 1)
Read back of Min or MAX traces now possible
Alias commands added: TRACe:LOAD:SWE = TRACe:LOAD:SWP
GPIB commands for selection of Y-Source and Reference settings in display config panels for all display subsystems implemented ------- Y-Source commands ---------- DISPlay:SWE<i>:A:YSOurce DISPlay:SWE<i>:B:YSOurce OFF | FUNC1 | FUNC2 | FREQ1 | FREQ2 | PHASe | GROupdelay | LMRM1 | LMRM2 | LMDC1 | LMDC2 | LMPK1 | LMPK2 | INPP1 | INPP2 | FILEA | FILEB <i> = 1, 2, 3, 4

DISPlay:FFT<i>:A:YSOurce
DISPlay:FFT<i>:B:YSOurce
OFF | FFTL1 | FFTL2 | FFTP1 | FFTP2 | FILEA | FILEB
<i> = 1, 2

DISPlay:MON:A:YSOurce
DISPlay:MON:B:YSOurce
OFF | LEV1 | LEV2 | PHAS1 | PHAS2 | FILEA | FILEB

DISPlay:WAV:A:YSOurce
DISPlay:WAV:B:YSOurce
OFF | LEV1 | LEV2 | FILEA | FILEB

DISPlay:BAR<i>:A:YSOurce
DISPlay:BAR<i>:B:YSOurce
OFF | FUNC1 | FUNC2 | FILEA | FILEB
<i> = 1, 2

---------- Reference commands ----------

DISPlay:SWE<i>:A:REFerence
DISPlay:SWE<i>:B:REFerence
DISPlay:FFT<i>:A:REFerence
DISPlay:FFT<i>:B:REFerence
DISPlay:BAR<i>:A:REFerence
DISPlay:BAR<i>:B:REFerence
MEASpanel | VALue | MAXimum | XCURsor | OCURsor | REF997 | REF1000 |
CH1Meas | CH2Meas | GENTrack | FILE | HOLD
<i> = 1, 2, 3, 4 for Sweep
<i> = 1, 2 for FFT and Bargraph

DISPlay:MON:A:REFerence
DISPlay:MON:B:REFerence
VALue | MAXimum | XCURsor | OCURsor | REF997 | REF1000 |
CH1Meas | CH2Meas | GENTrack | FILE | HOLD

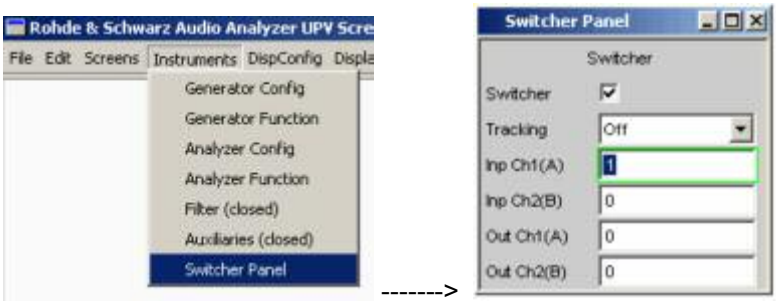
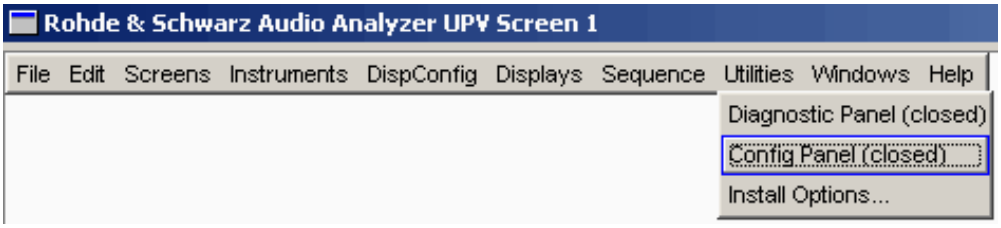
DISPlay:WAV:A:REFerence VALue

DISPlay:WAV:B:REFerence VALue ---------- commands to set the reference value ---------- DISPlay:SWE<i>:A:REFerence:Value <nu> DISPlay:SWE<i>:B:REFerence:Value <nu> DISPlay:FFT<i>:A:REFerence:Value <nu> DISPlay:FFT<i>:B:REFerence:Value <nu> DISPlay:MON:A:REFerence:Value <nu> DISPlay:MON:B:REFerence:Value <nu> DISPlay:WAV:A:REFerence:Value <nu> DISPlay:WAV:B:REFerence:Value <nu> DISPlay:BAR<i>:A:REFerence:Value <nu> DISPlay:BAR<i>:B:REFerence:Value <nu> <i> = 1, 2, 3, 4 for Sweep <i> = 1, 2 for FFT and Bargraph
Remote operation no longer displays any message boxes
GPIB commands for Waveform monitor added: SENSe7:FUNCtion ON | OFF SENSe7:MMODe STANdard | COMPressed (compressed not yet implemented) SENSe7:COMPfact <n> (compressed not yet implemented) SENSe7:INTerpol N1 | N 2| N4 | N 8| N16 | N32 (interpolation not yet implemented) SENSe7:TRCLength <nu> SENSe7:TRIGger:SOURce CH1 | CH2 | MANual SENSe7:TRIGger:LEVel <nu> SENSe7:TRIGger:SLOPe RISing | FALLing SENSe7:TRIGger:PRE <nu> (pretrigger not yet implemented) SENSe7:TRIGger:AUTo ON | OFF

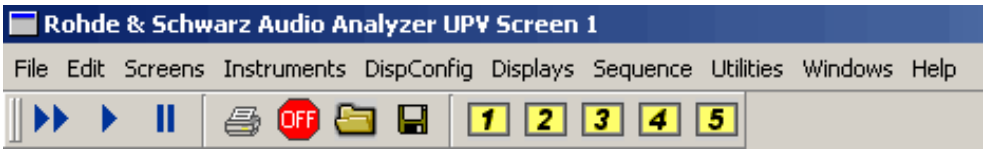
Version 1.1.0

Analyzer/Generator
DFD and ModDist signal generation and analysis implemented in analog and digital domain.
DIM signal generation and analysis in analog domain only, with UPV-B3 installed.
RMS selective, Peak and Q-Peak measurements implemented

Jitter and Interface Test available, with option UPV-K22 installed
Sample rate measurement implemented
THD+N wide filter now available
Multisine with up to 32 spectral lines
Random signal generation in frequency and time domain
Arbitrary waveform generation
Phase sweep for stereo sine

General
R&S UPZ Switcher Control implemented: Connect UPZ to COM port of UPV, then open Switcher Panel …..  Functions are identical to UPL, see UPZ operating manual
Help system implemented (English version only)
New file selector for Save/Load accepts alphanumeric entry from frontpanel keys
Option UPV-K1 (Automatic Sequence Controller) now supported
Audio Monitor: Signal Source extended to Function and Generator
Audio Monitor: Speaker and Phone Out can be activated separately. Plug in of Headphone Jack does not mute the speaker.
Multiscans implemented
Start UPV with preset: Press front panel PRESET key, when UPV start screen appears
Menu bar and/or tool bar can be switched to permanent view … open config panel …  … make the following selections …

… and you get …



Remote Control
New command “SYSTem:SHUtdown” shuts down the instrument. Same function as front panel key SHUTDOWN.
New commands to read back trace data, see below

UPV read back trace data

The UPV has 10 graphic subsystems:

4 Sweep graphs

1 FFT monitor graph (not yet implemented)

2 FFT graphs

1 Waveform graph

2 Bargraphs

In each of them you can read back the values of X axis and Y axis of trace A and B.

Graphic subsystem	**Command to read back**	**Comment**
Sweep graph <i> (i = 1, 2, 3, 4)	TRACe:LOAD<i>:SWP_AX? TRACe:LOAD<i>:SWP_AY? TRACe:LOAD<i>:SWP_BX? TRACe:LOAD<i>:SWP_BY?	Trace A, X axis Trace A, Y axis Trace B, X axis Trace B, Y axis
FFT Monitor	TRACe:LOAD:MON_AX? TRACe:LOAD:MON_AY? TRACe:LOAD:MON_BX? TRACe:LOAD:MON_BY?	Trace A, X axis Trace A, Y axis Trace B, X axis Trace B, Y axis
FFT graph <i> (i = 1, 2)	TRACe:LOAD<i>:FFT_AX? TRACe:LOAD<i>:FFT_AY? TRACe:LOAD<i>:FFT_BX? TRACe:LOAD<i>:FFT_BY?	Trace A, X axis Trace A, Y axis Trace B, X axis Trace B, Y axis
Waveform graph	TRACe:LOAD:WAV_AX? TRACe:LOAD:WAV_AY? TRACe:LOAD:WAV_BX? TRACe:LOAD:WAV_BY?	Trace A, X axis Trace A, Y axis Trace B, X axis Trace B, Y axis
Bargraph <i> (i = 1, 2)	TRACe:LOAD<i>:BAR_AX? TRACe:LOAD<i>:BAR_AY? TRACe:LOAD<i>:BAR_BX? TRACe:LOAD<i>:BAR_BY?	Trace A, X axis Trace A, Y axis Trace B, X axis Trace B, Y axis

4 Fixed Bugs

Version 2.1.1

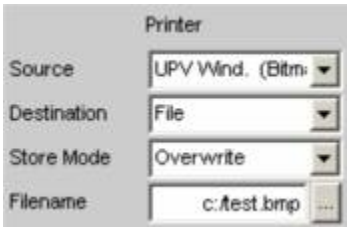
Malfunction when entering a function reference value for channel 2: The value entered for channel 2 did not effect channel 2 but channel 1 result. Channel 2 always referred to 1.0.

Version 2.1.0

Analyzer function Record: Level trigger now works properly independent from Waveform function being switched on or off.
Level monitor peak displayed a wrong result, if frequency measurement was switched off.
Analyzer function RMS Selective: Freq Mode Auto Both: Measurement result was set to invalid (---) on both channels, if one channel had no signal. Now both channels measure independently.
In bargraph display limit check did not work properly, if limit shift was used. Now fixed.
Improved handling of limit files, which could not be loaded.
Improved indication of execution errors during remote control.

Version 2.0.0

Signal to Noise measurement: After a Single Sweep had terminated, S/N measurement continued at the start frequency of the sweep. Now S/N measurement is stopped at the end of the sweep. Single channel sweep did not start, if settling was activated.
Phase measurement: If a frequency could not be measured (e.g. due to low signal level), or if frequencies are different in both channels, phase measurement result is marked as invalid (---). Up to now a (meaningless) phase result was displayed.
RMS selective measurement: With Bandwidth set to “BP 1/3 Oct Fast” and Frequency mode set to “Gen Track” a change in frequency at low frequencies could produce a wrong first reading. Now correct result, due to slightly increased internal settling time.
Generator function Play: No output signal, if analog generator is used and only channel 2 is switched on. Now correct output signal.
A-weighting filter was overdriven, when used in analog analyzer with 250 kHz bandwidth. Now correct function, due to increased internal headroom.
Measurement was stopped when a setting was made in the Switcher Panel. Now measurement continues.
Remote control command “HCOPy[:IMMediate]” did not work. Now correct function.

The Error Bit (ERRQ) in the Status Byte (STB) was only set due to Syntax Errors. Now also Execution Error and Device Dependent Error set the Error Bit.
Switching from REMOTE to LOCAL now automatically updates numeric measurement values and graphic displays
During remote control measurement was stopped when the command “*rst” was sent. Now measurement continues.
Config Panels for Function, Input, Level Monitor and Freq/Phase: The entry fields “Left” and “Right” for bargraph scaling are interchanged. Now “Right” is on top of “Left”, because “Left” depends on the setting of “Right”.
 Though Store Mode Overwrite was selected, the UPV asked before storing the file. Now the file is stored (overwritten) without further request.
 In some cases, though set to Auto mode, a wrong Label or Unit might be displayed. Now fixed.
Handling of Limit Files in Display Config Panels was improved due to several bugfixes.
Limit lines: Valid range for the value of limit lines was limited to the range between top and bottom of the graphic display. Now the value for the limit lines does no longer depend on the settings of top and bottom.
Limitfiles, having a unit with a Δ (delta) character, could not be loaded. Now correct.

Version 1.4.0

When changing the generator instrument or loading a setup while the UPV is in “Output Off” state, the generator state bits 10 to 12 in questionable register did not indicate the correct state.
Jitter weighting filter: 3 dB cut-off frequency changed from 200 Hz to 700 Hz
Problems with UPV-K1 operation fixed: - Firmware crash if restarting external EXE immediately after last execution - Reading empty strings under some circumstances, mostly after reading binary data
Problems with UPV-K4 operation fixed: - Time consuming setting commands even if setting is not changed - Firmware crash after long time of operation in conjunction with loading setups
Analyzer start condition Time Tick: Time intervall was longer than set in the panel, now correct.
Time Tick/Chart: Though not valid and not indicated in the Panel, a delay selected before was still used. Now delay = 0 is used.

RMS selective measurement did not start during Generator sweep when Analyzer Frequency Mode was set to Generator Track **-> Fixed**
Reference set to o-cursor or x-cursor did not work correctly **-> Fixed**
Equalization file was ignored in generator function Burst **-> Fixed**
Noise density measurement: Now correct results for every window, not only for rectangular.
Sometimes during remote control correct commands were rejected **-> Fixed**

Version 1.3.0

In continuous measurement mode (init:cont on) the 0 to 1 transition of the OPC-Bit, which can be used to generate an SRQ, now comes after the first valid measurement value. Up to now the OPC-Bit was not supported in this mode, because a continuous measurement was treated as an operation that is never completed. For remote control it is recommended to generally use the single measurement mode (init:cont off), which returns settled measurement values.
When sending more than one remote command in one control program line, and mixing common commands with UPV specific commands, in an unpredictable way some of the commands might be ignored. **-> Fixed**
Status reporting system: Execution Error Bit now supported.
During single measurement the autoranger might not terminate due to some strange input signals **-> Fixed**
In THD+N measurement, using Meas mode Noise, the result was dependent on the size of the FFT **-> Fixed**
In the display config panels the state of Label Auto Unit Fnct Track Unit Auto was not stored in a setup file **-> Fixed**
When switching to measurement functions Mod Dist or DFD from any other measurement function having a filter switched on, this filter was not switched off **-> Fixed**
Signal to Noise Measurement with a filter switched on: Though the filter is bypassed during signal measurement, the internal filter gain was still active, resulting in too good measurement values **-> Fixed**
Waveform Mode Compressed: Measurement time was multiplied by compression factor, resulting in unnecessary long times. **-> Fixed**
If the Help or Fileselector window is minimized (only possible if the UPV is operated by mouse) the UPV application seems to freeze. That's why the minimized window still has the focus but is not accessable via front panel keys (only via alt+tab using an external keyboard). **-> Fixed** Now the Help or Fileselector window can no longer be minimized.
An Equalization file having 256, 512, 768 or 1024 points loaded in Generator or Analyzer was ignored **-> Fixed**
Display Config Panel: Though tracking was checked, the normalize settings were not tracked from trace A to trace B

-> Fixed

Version 1.2.2

Bugfix of hang-ups after very long time of remote control **-> Fixed**

- Redesign of measurement handshake host / DSP to avoid unrequested Upload messages caused by autoranger activity. Although these messages had been ignored by host it might cause communication hang-ups ("No response from DSP B1…") if more than 1 autoranger message was sent before end of measurement was acknowledged by host.
- Bugfix of DSP A1 crash caused by autoranger activity if signal level was raised just before end of measurement.

Bugfixes RMS selective:

- Bandpass "1/3 octave fast": SINGLE key stroke resets filter delay lines and starts measurement without resetting filter.
- Auto Measurement ("Freq Mode Freq Ch1/2") did not terminate if no signal provided (instable frequency measurement)

Autoranger improved:

During long measurements (e.g. RMS selective-measurement using sharp selection filters) peaks with repetion rates below 5 Hz might cause never terminating measurement due to infinite up and down ranging. **-> Fixed**

Read back trace data via remote control returns traces that use Reference Value set in Meas Panel instead of Reference Value set in Display Config Panel. Workaround: Track Display Panel Reference to Meas Panel and set the Reference Value in Meas Config Panel. **-> Fixed**

Generator Function Play: ‘OUTPUT OFF’ key didn’t switch on the switched-off signal. **-> Fixed**

Analyzer Config Panel: Switching Channels to 1=2 didn’t track a fixed range from Cannel 2 to Channel 1. **-> Fixed**

Version 1.2.1

Waveform trigger level: wrong units and limit values when changing analyzer instrument. **-> Fixed**

Remote control: Problems when frequently sending GTL commands. **-> Fixed**

Remote control: SRQ now correctly generated on OPC.

Sometimes in an unpredictable and not reproducable manner after many hours of remote operation the UPV application terminates. A message box "...memory could not be read" may occur. **-> Fixed**

Normalize of curves: In case of Reference = Gen Track, graphics is updated during running sweep only. **-> Fixed**

Version 1.2.0

Frequency response of user defined *.npz filters is now independent of sample rate
Weighting filters having gain > 1 no longer clip at Fullscale
When UPV is powered on, the SW performs an internal DC offset measurement, which fails, if the DC voltage is already present at the inputs during power on. This in turn produces an erroneous DC voltage reading. **-> Fixed**
FFT or Waveform traces longer than 32 k points could not be stored. **-> Fixed**
Output OFF key or any user settings in Auxiliaries or Filter Panel start a terminated measurement or a waiting sweep. **-> Fixed**
Arbitrary function: Not the maximum value in the file but the value 1.00 was scaled to the peak value as set in the generator function panel, resulting in erroneous level settings. **-> Fixed**
Generator overload was not indicated (by LED and status Gen overload) as long as no measurement was running (Analyzer terminated), nevertheless the hardware was switched of anyway. **-> Fixed**

Version 1.1.0

Don’t use sample rates > 96 kHz for digital instruments. If > 96 kHz is necessary, change sample rate in analyzer config panel first. **-> Fixed**
Digital audio generator: Phase to Ref setting terminates application. **-> Fixed**

5 Known Bugs

When closing the UPV application using Menu -> File -> Exit, the UPV will not close down properly, but will show an error message or crash. To correctly close the UPV application it is recommended to click to the close button  on the title bar of the application.
The use of the old UPL remote control commands "SENSe:VOLTage:RANGe[1] | 2:LOWer <nu>" and "SENSe:VOLTage:RANGe[1] | 2[:UPPer] <nu>" can force an error message "Data out of range"

Instead of using the old UPL command "SENSe:VOLTage:RANGe[1] | 2:LOWer <nu>" it is recommended to use the UPV commands "SENSe:VOLTage:RANGe[1] | 2:MODE LOWer" followed by "SENSe:VOLTage:RANGe[1] | 2:VALue <nu>" Instead of using the old UPL command "SENSe:VOLTage:RANGe[1] | 2[:UPPer] <nu>" it is recommended to use the UPV commands "SENSe:VOLTage:RANGe[1] | 2:MODE FIXed" followed by "SENSe:VOLTage:RANGe[1] | 2:VALue <nu>"
If one or both of the old UPL remote control commands "SOURce:SWEep:MODE AUTO" and "SOURce:FREQuency | VOLTage | ONTime | INTerval:MODE CW | FIXed | SWEep1 | SWEep2 | LIST1 | LIST2" are used for sweep setting, an error message "Data out of range" will be forced. Instead of using the old UPL command(s) it is recommended to use the UPV commands "SOURce:SWEep:CONTrol OFF | ASWeep | ALISt" “SOURce:SWEep:XAXis | ZAXis FREQuency | VOLTage | ONTime | INTervall

6 Side Effects

Version 2.1.1/2.1.0/2.0.0

None

Version 1.4.0

In rare cases, firmware installation after reboot fails. Please try again installing the firmware.

Version 1.3.0

After changing the number of points of a generator sweep, the new sweep must be started with the start key. Otherwise, depending on the direction of the sweep, wrong or incomplete data are displayed.
In rare cases, firmware installation after reboot fails. Please try again installing the firmware.
Front panel keys WINBAR and MODIFY are not working properly, when menu bar is set to permanent view. In this case the UPV is probably operated by mouse, and then those keys are not needed, because mouse operation is more comfortable.

Version 1.2.2

Waveform Measurement Mode Compressed is selectable, though not yet implemented. **-> Fixed** Compressed Mode is now implemented
Softkeys Trace Show A or Show B don't work properly if traces loaded from file are displayed **-> Fixed**
In rare cases, firmware installation after reboot fails. Please try again installing the firmware.
Front panel keys WINBAR and MODIFY are not working properly, when menu bar is set to permanent view. In this case the UPV is probably operated by mouse, and then those keys are not needed, because mouse operation is more comfortable.

Version 1.2.0

SCPI recording: Commands which do not select a state but an action are not recorded correctly. The state after the action is recorded, not the action itself. **-> Fixed**
It is not recommended to install a UPV simulation on a PC. Installshield does not finish properly and firmware cannot be removed afterwards. **-> Fixed**
Front panel keys WINBAR and MODIFY are not working properly, when menu bar is set to permanent view. In this case the UPV is probably operated by mouse, and then those keys are not needed, because mouse operation is more comfortable.
Waveform Measurement Mode Compressed is selectable, though not yet implemented.
Softkeys Trace Show A or Show B don't work properly if traces loaded from file are displayed
In rare cases, firmware installation after reboot fails. Please try again installing the firmware.

Version 1.1.0

Front panel keys WINBAR and MODIFY are not working properly, when menu bar is set to permanent view. In this case the UPV is probably operated by mouse, and then those keys are not needed, because mouse operation is more comfortable.
SCPI recording: Commands which do not select a state but an action are not recorded correctly. The state after the action is recorded, not the action itself.

It is not recommended to install a UPV simulation on a PC. Installshield does not finish properly and firmware cannot removed afterwards.

7 Hotline

If you have any questions or suggestions, please contact our hotline:

Telephone:	+49 (0)180 512 42 42
Fax:	+49 89 41 29 137 77
E-mail:	CustomerSupport@rohde-schwarz.com