ROHDE&SCHWARZ

Radiomonitoring and Radiolocation
Division

Release Notes

Firmware Update V03.90

R&S DDF255

4067.9240.02
4067.9240.03

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Dear Customer,

Throughout this manual, DDF255 is generally used as an abbreviation for R&S DDF255.

Trademarks

Contents

1 General Information

Installation CD DDF255

CD Version: V03.90

Release date: 2012-07-26

Part No.: 4068.0230.00

1.1 Software on this CD:

Folder	Description	Version	Material No.
\DDF255-GUI	DDF255 GUI	V03.90	4068.0424.00
\DDF255-Firmware	DDF255 firmware	V03.90	4068.0418.00
\DDF255_Rel_Notes.pdf	Release notes (this file)	V03.90	
\Utilities\TCPexample	TCP program example	n/a	
\Utilities\UDPexample	UDP program example	V5.54	
\Utilities\Correction Data Example	Correction data examples	n/a	
\FAQ	Frequently asked questions	n/a	

1.2 Manual for DDF255

The following manual is supplied with the DDF255: **Manual DDF255**

The new firmware version V03.90 corresponds to manual 4067.9270.32 V08.00

How to obtain a current version of the manual

- Order a printed manual from Rohde & Schwarz, order no. 4067.9270.32.
- You will also find the current release of the manual in PDF format in the Rohde & Schwarz Sales Web. If you don't have access to this Board, please ask your local support for a manual in PDF format.
- You will also find PDF documents of the current release of the manual on the manual CD.

2 Firmware and Software Installation for the DDF255 System

IMPORTANT:

It is necessary to update or install the DDF255GUI software and the firmware version for the DDF255 from the same CD.

- Insert the CD with the DDF255GUI into the CD drive.
- If auto start is activated on your computer your internet browser will start automatically. Click on the "DDF255GUI" button and then on "DDF255GuiInstall.exe".
- If auto start is not activated on your computer enter on the command line the letter of the CD drive followed by ":\DDF255-GUI\DDF255GuiInstall.exe". Accept with “OK”
- Follow the instructions of the setup program.

Note:

For a firmware update please refer to the DDF255 manual.

3 Release Notes:

3.1 DDF255 Firmware V3.90 dated July 26, 2012

3.1.1 New Features

- The hardware option R&S DDF255-IGT (Internal GPS Time Synchronization) is now supported. DDF255-IGT enables internal GPS time synchronization based on a device-internal GPS module. This allows highly accurate time stamps for TDOA applications.
- To measure Watson-Watt DF antennas, activating the "DFOMNiphase" sensor function allows the omniphase to be output via remote command and displayed using the Udpexample.exe program.
- For test purposes, correction of the k-factor, omniphase, azimuth and cable attenuation measurement values can be switched on or off via remote commands.

3.1.2 Improvements

- For TDOA applications the accuracy of OCXO calibration has been improved. Precondition is a synthesizer 1166.3170.05 of TAZ 08.00 or later.
- The write speed of the flash file system has been improved.
- The output accuracy of the DF bandwidth has been changed to mHz.
- The number of trace sockets which can be open at any one time has been extended to ten.
- Some optional headers of the EB200 datagram have been extended. From "VersionMinor" 0x53 upward, the parameter fractional step frequency is added to the OptionalHeaders of PSCan, IFPan, VIDEO and DFPan.

  The parameters StepFreqNumerator, StepFreqDenominator and FreqOfFirstStep enable exact calculation of the frequency of each level sample even with periodic StepFreq, e.g. 8 1/3 kHz.
  FreqOfSample = FreqOfFirstStep + SampleNumber * StepFreqNumerator / Step-FreqDenominator
  Thus the frequency of each sample needs not be transferred and the data rate is reduced to 1/5 (2 bytes level compared to 8 bytes frequency plus 2 bytes level).

  The DFPan OptionalHeader now contains a high-resolution representation of the direction finding bandwidth.
- The individual DDC audio data streams can now be controlled in line with the squelch.
- With a narrow span (< 1Mhz) the filters are now calculated with higher resolution. This improves the dynamics by more than 12 dB, especially in the HF range.

3.1.3 Changes

- Automatic antenna control is now also switched off when changing the HF tuner limit.

3.1.4 Problems Solved

- The DTMF decoder no longer ignores some numbers.
- If a receive frequency was set which was between the frequency ranges of two DF antennas, it was possible for both antennas to be supplied with voltage at the same time. This problem has been solved.
- The audio via LAN was briefly disturbed every 15 s. This problem has been solved.

- With low distortion mode and auto attenuator the receiver showed a limited dynamic range behavior. This problem has been solved.
- The audio filter function was cancelled when changing the demodulation mode or bandwidth. This problem has been solved.
- If the data output for IQ data was configured during an ongoing PSCAN, both PSCAN data and IQ data were output. Any output of IQ data during an ongoing PSCAN is now suppressed.
- In prior releases, entering a correct IP address did not terminate the search for a network time server with an incorrect IP address.
- If the clock was set to external start, it was not set correctly when a GPS or NTP server was connected. This problem has been solved.
- The DDC group ‘NARROW’ of the DDCE software option R&S DDF255-DDCE now also sets the time stamp field in the result format.
- In V03.75, samples were dropped in IQ data output via UDP when the bandwidth exceeded 10 MHz. This problem has been solved.
- During data output of 16-bit I/Q samples using the AMMOS format via UDP, one frame was consistently dropped every 20 minutes and 52 seconds. This problem has been solved.
- The system crashed when the RDS information was displayed via the WEB page and an external GUI was subsequently started. This problem has been solved.
- An open DDC TCP trace was closed when another DDC TCP trace was opened. This problem has been solved.
- Remote command "fm:rds:groups:clear" produced error message -221,"Settings conflict;Write protected". This problem has been solved.
- The red fail LED now also lights up when a voltage test point in the ADC board fails.
- The PSCAN spectrum started flickering when changing the attenuation. This problem has been solved.
- Query "DIAG:INF:SVER8?" now returns the version of the option board 2 FPGA firmware. The version info of all FPGAs and the CPLD on the option board 2 (SignalProcessing Board) can now be queried.
- I and Q were mixed up in the IQ data stream using the 10G interface. This problem has been solved.
- When the DF result was output, there was a rounding problem in the range between -0.5 and 0.0. This problem has been solved.
- When the span was less than 20 MHz and the demodulation bandwidth exceeded 10 MHz, the narrow-band DDCs and the 10G data stream were on the wrong frequency. This problem has been solved.
- When there was no signal at the antenna input, small DC spikes were visible in the panorama center at 10 MHz span with 8.333 kHz resolution, and at 20 MHz span with 10 and 20 kHz resolution in FFT mode Average. This problem has been solved.

3.1.5 Known Errors and Limitations

- When switching spans of 20 MHz or less to the wideband path (40, 80 MHz), pulse duration measurements sometimes cause a shift of the PDM spectrum. This is caused by a faulty synchronization when switching to the wideband path. The PDM spectrum is corrected when the span is again switched between 40 MHz and 80 MHz, or when another receiver parameter is changed.
- The DDC group ‘STD’ of the DDCE software option R&S DDF255-DDCE is currently not supported; only the DDC group ‘NARROW’ is available.

3.2 DDF255 GUI V3.90 dated July 26, 2012

3.2.1 New Features

- The software option R&S DDF255-IGT (Internal GPS Time Synchronization) is now supported. DDF255-IGT enables internal GPS time synchronization based on a device-internal GPS module. If option DDF255-IGT is installed, the internal GPS can be configured using the IGT dialog.
- The waterfall representation is now based on stored raw data. This allows subsequent scaling and color calculation without any data loss.
- A Minimum Hold can now be set in the RF panorama as well.

3.2.2 Improvements

- The Location dialog has been improved.
- Entering hex numbers has been improved.
- Function "adjust level range" has been improved.
- Using the DDCs has been improved.
- The GPS icon now indicates whether or not a connected GPS is in use.
- Manipulation of the X and Y markers has been redesigned and improved.
- Manipulation of the history rulers has been redesigned and improved.
- The color squelch can now be controlled via the mouse.
- In the Antenna Overview dialog, the graphical representation of the antennas in use has been improved.
- A warning is now issued when mass data cannot be received, e.g. due to an active remote lock.
- The external GUI now shows the device it is connected to in its title bar.
- The external GUI now has dock widgets which can be floated and resized.

3.2.3 Changes

- In FSCAN or PSCAN stop mode the X axes were updated immediately and the RF panorama was cleared when the start or stop frequency was changed. As of the current release, the RF panorama is maintained and the axes are not updated until the FSCAN or PSCAN is started. No update takes place before the measurement time elapses.
- With audio recordings from DDC and modulation mode FM, only FM is recorded in the WAV file. The same applies to modulation mode AM.
- In the DF panel, the "SQU MODE" softkey is now called "DF SQ MODE".
- The default value of the interpolation mode has been changed from COMB to BAR.
- The parameter display in the location panel has been extended.
- The obsolete field "Antenna" has been removed from the Memory dialog.

- If there is a DDC audio or DDC IQ recording and the DDC bandwidth or DDC modulation mode is changed, the recording is no longer stopped automatically. A stop requires a change of IQ and other demodulation modes, or a change in the sample rate of the IQ recording.
- The Version dialog has been changed. It now also shows the FPGA and CPLD version data of the signal processing board.
- If the DDCs are present, the sum audio is now always recorded with two channels since the audio mixing allows any combination of demodulation modes.
- The DF Polar Panel has been improved (background; representation of the car).

3.2.4 Problems Solved

- The display accuracy of the DF bandwidth is now mHz.
- The DSC number in the Selcall dialog is shown in octal format using three digits and leading zeros.
- The scan mode selector is cleared when switching to FFM.
- Recording to the internal compact flash disk is now done with a maximum DDC IQ bandwidth of 250 kHz. This limit is monitored by a bandwidth calculator. If the limit is exceeded, error message "Recording of DDC not possible because data rate too high for storage media." is generated. In the case of an external GUI running on a fast PC, four DDCs can be recorded at 1 MHz.
- The field strength in the polar display is produced from the mass data (field strength = level + AntFactor).
- Fonts are now scaled upon a resize. Fonts are no longer clipped.
- The marker level values in the measurement panel are not updated correctly when averaging is switched on during scanning. This problem has been solved.
- If the DDCs were coupled to the receiver's demodulation parameters and the bandwidth on the receiver was set to a value between 1.25 MHz and 20 MHz, error message "-222, "Data out of range. Bandwidth not installed." was generated. This problem has been solved.
- The comb spectrum no longer shows random artefacts.
- In History mode, the X markers now resume their previous position when they are re-activated.
- In Differential mode, the Y axis is always drawn symmetrically.
- In Differential mode and frozen condition, the spectrum sometimes stayed green instead of changing to gray.
- Under certain conditions, the history ruler and the markers were not shown solid.
- The problems that occurred when recording to a full disk have been solved.

3.2.5 Known Errors and Limitations

- A reverse file replay causes the last (or first) chunk of the file being replayed in a loop.
- A bandwidth measurement with limited frequency range can currently only be done via remote command.

4 Release History

4.1 DDF255 Firmware V3.75 dated February 15, 2012

4.1.1 New Features

- The antennas ADD107 and ADD207 are now supported.
- The software option R&S DDF255-DDCE (DDC Signal Extraction) is now supported.
- The hardware R&S DDF255-SP (Signal Processing Board) is now supported. This board is prerequisite for R&S DDF255-DDCE.

4.1.2 Improvements

- None

4.1.3 Changes

- None

4.1.4 Problems Solved

- Due to timing problems, the measurement of test points on the SIGV board could fail. This problem has been solved.
- In production with some Multi ADC boards the IP3 limits could not been reached. This problem has been overcome by reducing the gain in the RF converter.

4.1.5 Known Errors and Limitations

- The DDC group ‘STD’ of the DDCE software option R&S DDF255-DDCE is currently not supported, only the DDC group ‘NARROW’ is available.
- The DDC group ‘NARROW’ of the DDCE software option R&S DDF255-DDCE does not set the time stamp field in the result format.
- The query command `DIAG:INF:SVER8?` does not return the version of option board 2 FPGA firmware.
- See also previous version.

4.2 DDF255 GUI V3.75 dated February 15, 2012

4.2.1 New Features

- None

4.2.2 Improvements

- None

4.2.3 Changes

- None

4.2.4 Problems Solved

- When starting the time configuration dialog the displayed month was not correct.
- Frequent an fast changing between application mode RECEIVER and DF could lead to stability problems. This problem has been solved.

4.2.5 Known Errors and Limitations

- The version of option board 2 FPGA firmware and the option board 2 CPLD code is not displayed.
- See also chapter 4.2.5

4.3 DDF255 Firmware V3.70 dated July 21, 2011

4.3.1 New Features

- The hardware option 10G Ethernet interface for wideband I/Q data output is now supported.
- The new hardware ADC2 board (MULTI_ADC) is now supported. This board replaces the ADC board.
- The frequency range for bandwidth measurement can now be configured within the IF panorama span. This feature is only available via remote interface.
- The antenna factor (KFactor) is now available in data output protocols IF, DFPan, AIF, ADDC and 10G.
- The system time can now be set via NTS (Network Time Server) and GPS. Time synchronization can now be done via PPS (Pulse Per Second).
- The new GPSCompass data stream contains GPS and compass data and a high-resolution time stamp.

4.3.2 Improvements

- Remote query command `SYSTem:SECurity:OPTion:INFormation?` returns the extended information for all active software options. Thus the duration of demo keys can be read out.

- In the status reporting system an additional operation fan out status registers show the reference state with the `REFSettling` bit and the OCXO state with the `WARMingup` bit, respectively.
- According to SCPI the remote commands with token `"INFO"` can alternatively be used with token `"INFormation"`.
- The bearing calculation for very short pulses has been improved.

4.3.3 Changes

- Changing the LAN port configuration now affects only the remote interface rather than the device internal LAN. When starting the GUI on an external PC the LAN port can be configured via command line parameter (see External_GUI_Configuration.pdf on the Firmware & Utilities CD). The LAN port number range has been extended to range from 1024 to 65535.
- According to the definition of the AMMOS data format the polarity of the “Invalid Flag” has been changed.

4.3.4 Problems Solved

- With 80 MHz IF panorama span and selectivity set to sharp or narrow, a signal exactly at the mid frequency sometimes showed an alternating level. This problem has been solved.
- During GH150 compass calibration the compass sometimes sent strange answers. This problem has been solved.
- When switching from external to internal reference, test point “REVLEV” sometimes was out of range with new synthesizers. The problem has been solved by extending the switch delay time.
- When switching in FSCAN from SHF frequency range to a frequency near the upper limit of the UHF frequency range, the first channel was not measured correctly due to synthesizer settling time. This problem has been solved.
- When running PSCAN in SHF frequency range with IF panorama span 80MHz the spectrum was not flat. This problem has been solved.
- The video spectrum would sometimes show incorrect values after switching to 40 MHz IF panorama span.
- The optional header of the DFPan data stream now contains a correct PDOP value.
- The polychrome pulse display showed a temporarily incorrect spectrum when slowly turning the rollkey. This problem has been solved.
- After startup or a change in bandwidth in continuous measure mode, incorrect demodulation depth measurement values may have been displayed for a short period of time. This problem has been solved.
- With devices equipped with old processor boards (product index lower than 5.xx), the video output now works in FM mode as well.
- The analog video or IF output now also works with 12.5 MHz and 15 MHz, respectively.
- Depending on the step setting, the IF filter calibration did not start with error message `-221, "Settings conflict; IFPAN step width too low"`. This problem has been solved temporarily by setting the step to automatic.
- With installed option SHF and without X43, the long test would sometimes fail with error message `"level to high at … GHz"`. This problem has been solved.
- During a PSCAN with the 80 MHz ADC-Board the receiver could remain overloaded caused by a strong signal although the attenuation was set to automatic. This problem has now been solved by a two-step level check.
- After a change in bandwidth in the main demodulation path, sporadic signal drops occurred in the sum audio of the DDCs. This problem has been solved.

- With demodulation bandwidth 0.3 kHz and 0.6 kHz the FM deviation measurement showed incorrect values. This problem has been solved.
- With 80 MHz IF panorama span the LO3 was visible. This problem has been solved.
- The HP/LP filter in the HF preselector was no longer changed once the span was set to 20 MHz. Also, after changing back to smaller spans, the filters no longer changed. This problem has been solved.

4.3.5 Known Errors and Limitations

- The GUI firmware version number and the main processor firmware number must be the same. Otherwise the new functions may be incompatible with prior versions due to function extensions made during development (e.g. additional demodulation bandwidths).
- After a firmware downgrade, the device may not function anymore because the older firmware will not recognize the new hardware.
- To achieve maximum scan rates the offset measurement has to be switched off. Please set the parameter “Show Level, Offset or Fieldstrength” to “Level only” in the SETUP – CONFIG- Panels dialog.
- Simultaneous data output via LAN of video panorama and IQ data is only possible up to 8 MHz bandwidth. With bandwidths greater than 8 MHz only IQ data is available.
- Direction finding is not available with 40 or 80 MHz IF panorama span.
- With option board DDF255-ADC, the wideband output X21 is no longer available.
- Due to hardware limitations only the first 1000 memory channels are stored nonvolatile. To store channels 1001 to 9999, the internal or external GUI “PRESET Profile” function can be used.

4.4 DDF255 GUI V3.70 dated July 21, 2011

4.4.1 New Features

- The new "Rainbow Ext" color set makes better use of the available color space. As a result, the values can be distinguished more easily.
- The Time and Date dialog has been extended to include the following functions: It now displays the time the clock was last set and the configuration determining the clock's start-up mode. The GPS time offset can now be configured as well. Finally, a network time server can now be used to set the clock (on a one-time basis per setting).
- Double-clicking the left-hand Y axis of the spectrum scales the value range automatically.
- Double-clicking the right-hand Y axis of the spectrum and the waterfall changes the color set.
- Double-clicking the left-hand Y axis of the waterfall changes the line-feed mode.
- Double-clicking the left-hand Y axis of the azimuth panorama changes the value range between -180° and 180°, and between 0° and 360°, respectively.
- Double-clicking the right-hand Y axis of the azimuth panorama clears the azimuth panorama.
- The current configuration of the client parameters is saved every ten seconds. As a consequence, a power failure will not result in lost settings. They will be reloaded following a system restart.
- A histogram can be activated for the compass dial.
- The current DDC can be selected using the mouse by right-clicking on the relevant DDC's ruler or marker.
- If the STEP is set to AUTO, the value used is shown in brackets right next to it.
- The mouse can be used to create a rectangle in the waterfall. This causes the mode to change to "History", and the red Y and X markers are placed along the rectangle's edges.
- The passband tuning can be changed using the mouse by performing a drag & drop operation in the panorama.

4.4.2 Improvements

- The representation of the softkeys, selectors and frequency panel has been improved.
- The display of the demodulation bandwidth has been optimized, both for the DDCs and the primary demodulator.
- Entering alphanumeric data has been improved by shortening the character-selection timeout.
- The volume of a selected DDC can be changed using the volume rollkey. It can also be switched on or off when the DDC panel has the focus.
- The record and replay dialog now offers an option to set the sum volume to 0% to suppress the live audio when listening to a WAV file.
- The record and replay dialog now offers an option to change the volume when listening to a WAV file.
- The online help system has been improved. Selectors can now be used to navigate through the hyperlinks within the help system.
- The DF bandwidth is now recorded and shown in the "History" mode.
- The ruler of the white Y history marker can now be moved using the mouse.

- If the softkey for the demodulation frequency has been activated and the rollkey is pressed, the demodulation frequency will be rounded to the channel spacing.
- The volume has been increased when playing WAV files via the internal GUI installation.

4.4.3 Changes

- The arrangement of the softkeys for the polychrome IF panorama has been changed, i.e. the "UPPER LIMIT" is now located at the top while the "LOWER LIMIT" is located at the bottom.
- The "Client Volume" option in the audio configuration dialog has been renamed to "Replay Volume".
- Closing the compass calibration dialog will abort any ongoing compass calibration process.
- When the default configuration is loaded while the "History" mode is on, the latter will be turned off.
- The direction of rotation of the Y markers has been unified across all waterfalls and panoramas.
- The frequency panel now shows the year rather than the day of the week.
- The passband tuning and the configuration of the inverse demodulation can now be performed via softkeys. They can no longer be changed via the audio dialog.

4.4.4 Problems Solved

- The white frequency marker in the "History" mode now uses the appropriate step value when the frequency is changed.
- The configuration now includes the state of the azimuth histogram (on or off).
- The RF panorama and RF waterfall can be zoomed when the X2 marker is located to the left and the X1 marker to the right.
- In the RF PAN layout, the panels now receive focus in the correct order for the video application mode.
- Any dialog entry fields designed to hold decimal numbers will only accept decimal numbers now. Entering multiple decimal points or a sign is handled appropriately and will no longer result in an error message.
- If the frequency range in the azimuth histogram is limited using the X1 and X2 markers, only the related frequency value's histogram is shown when both markers are located at the same frequency. In previous versions, the histogram of the entire frequency range was shown.
- If the global frequency unit is set to a unit other than MHz, the editor no longer changes all entries to MHz once ENTER is pressed. It is now capable of accepting any values with the given unit.
- The "+/-" key now properly changes the sign of a numeric entry with a given unit. In previous versions, it would generate numeric values with multiple signs.
- In the WF RF layout of the DF application mode, the DF waterfall now includes softkeys for Scan and Scan Stop.
- The network dialog allows the port to be set even when DHCP is used.
- With an external installation, pressing the mouse wheel is no longer ignored when the mouse pointer is located on a softkey. Instead, the related operation is performed.
- The demodulation bandwidth of the DDCs is now shown correctly for demodulation modes LSB and USB as well.
- An icon representing the 10GE data stream is shown when 10GE has been activated.
- The labeling of the selected X marker pair is no longer hidden behind by the labeling of the other X marker pair.
- The redirect function for the MGC key and the squelch key now also works for level unit "dBm".

- When text is entered in a hexadecimal number field, any text selected previously will now be deleted.
- The DDCs' ATC bandwidths are also shown in the spectrum.
- The location panel now displays any invalid locations as such.
- When zooming during an ongoing panorama scan, any previous bins will now be removed from the right margin.
- The ageing scale for the azimuth panorama is now represented correctly when the "Print" ambience is set.
- The differential mode is restarted when the FFT mode, the step or the selectivity is changed.
- The GUI no longer crashes when the "Default" preset is loaded while live audio is on.
- There are no more missing lines in the TV image.
- When recording of wave files is stopped, live audio will be set to the state, which it had before recording was started.

4.4.5 Known Errors and Limitations

- If the time axis of the waterfall reaches the minute range, [s] is shown at the axis even though the scale reads minutes.
- Ghost images may appear when the layout is changed.
- If the center frequency in the RF panorama is changed at the front panel using the mouse, an incorrect spectrum may be drawn.
- When the device is switched on to default settings, the key sound is not audible. The volume must be increased to make it audible.
- With azimuth color coding, the marker rectangle in the DF waterfall is hard to see or invisible.
- Any frequency range included in the suppress list will not be removed from the spectrum until the first frequency scan has finished.
- The Long Test does not work if it is started in a frequency range below 20 MHz.
- There will be problems when a recording is started while there is insufficient data storage capacity.
- The video waterfall will be cleared when the layout is changed.
- If the panorama's level range is equal to or less than 1 dB and the grid is on, only vertical lines will be drawn although the data is supplied at a resolution of 1/10 dB.
- The waterfall history in DF mode may be corrupted by another client's change of mode.
- During an ongoing panorama scan, invalid bins may remain visible along the right margin following a zoom-in operation.
- There are some representation and update errors in the differential mode.
- If markers have already been activated and positioned, they may change their position when the layout is changed or when they are turned on or off.
- Upon initial activation, the Y markers may be positioned such that they will be covered up by the history Y marker.
- The markers and related rulers are sometimes drawn incorrectly. A ruler may be drawn with a gap or with offset over several panels. It may also flicker. The marker value and the scale's labeling value may not match.
- If the mouse pointer is placed over a ruler, it may assume the shape of a drag & drop pointer. However, if you actually try to drag the ruler using the mouse a different operation may be performed.
- In the external GUI, live audio does not work with the 64 bit version of Win7.

- With measure mode continuous and short pulse signals, the displayed level measurement may dither due to overlapping display update frequency fluctuation. In this case use measure mode periodic.
- To get maximum scan rates the offset measurement has to be switched off. Please set the parameter “Show Level, Offset or Fieldstrength” to “Level only” in the SETUP – CONFIG- Panels dialog.
- Changing the display modes while audio replay causes audio interruptions.
- With an external installation and a low screen resolution, the GUI is difficult to control.
- With an external GUI installation and 100MBit LAN, there may be an occasional delay in data transfer during a panorama scan and certain spans.
- With an external GUI installation, data transfer of the polychrome IF panorama requires a 1 GBit LAN.
- When a WAV file is replayed backwards, the replay does not stop at the beginning of the file. The beginning of the recording is replayed repeatedly until you press "STOP" or "LOOP".
- The "Stop" mode is not resumed when the end of an audio data replay is reached.
- The label for the total replay time is not updated when a WAV file is replayed in the "Record and Replay" dialog.

4.5 DDF255 Firmware V3.51 dated March 17,2011

4.5.1 New Features

- In case of severe system errors a log file is reported to the flash file system.

4.5.2 Improvements

- None

4.5.3 Changes

- The device card of the service tool has been optimized.

4.5.4 Problems Solved

- Only a few devices equipped with SHF option had a infrequent boot problem. This problem has been overcome.
- Devices equipped with SHF option had sometimes a problem with the YIG filter switch. This problem has been solved.
- The calibration values of the YIG filter calibration could not be stored. This problem has been solved.
- With option DDF255-HF only a few devices reported after long test the error message " Level to high at 75 kHz". This problem has been solved.
- Antenna definition can now be overwritten without problem with the remote command . SYST:ANT:FACT:CAT

4.5.5 Known Errors and Limitations

- See previous version.

4.6 DDF255 GUI V3.51 dated March 17,2011

4.6.1 New Features

- None

4.6.2 Improvements

- None

4.6.3 Changes

- None

4.6.4 Problems Solved

- When installing the GUI by mistake on a desktop PC, laptop or server with the scenario “Internal” instead of “External” the computer could be damaged because in this case the boot.ini file was exchanged. This problem has been solved.
- Only a few devices showed a black screen after a short voltage drop. This problem has been solved with the new firmware version 2.25 of the keyboard controller FPC2. The keyboard controller firmware is updated during GUI installation..

4.6.5 Known Errors and Limitations

- See previous version.

4.7 DDF255 Firmware V03.50 dated January 13,2011

4.7.1 New Features

- Three additional demodulation filters with 8.33 kHz, 25 kHz and 75 kHz bandwidth are now available. The 8.33 kHz and 25 kHz filters are a special design for air traffic control communications according to ETSI EN 300676-1.
- The RX blanking input is now supported. The RX blanking state is entered in the IF data stream and is also supported in the status reporting system.
- The RX muting input is now supported. The RX muting state mutes the audio and is also supported in the status reporting system.
- The demodulation of inverted FM is now available.
- The antenna factors of the RX Antenna HE300 have been added.
- The azimut correction can now be defined for each polaraization of an antenna.
- Compass calibration is now also available via remote interface.
- The heading value of the software compass can now be set via remote command.
- Passband tuning is now available. The remote command is [SENSe:]DEModulation:PBT MIN|MAX| Frequency -8 kHz..8 kHz.
- Switching between active and passive has been added for DF antenna ADD295_VAR1x.
- GPS compass for ADD175 has been added.
- GPS compass for NMEA GPS has been added.
- The software version and date of the GUI and FPC (front panel controller) can now be queried via remote command.

4.7.2 Improvements

- The version number and date of the GUI firmware can now be read with commands diag:info:sver10? and diag:info:sdat10?, respectively.
- The version number and date of the keyboard controller FPC2 firmware can now be read with remote commands diag:info:sver11? and diag:info:sdat11?, respectively.
- The crack distortion when changing the demodulation mode has been eliminated.
- The boot speed of devices without DF connector board has been improved.

4.7.3 Changes

- The polychrome IF panorama optional header has been extended by the polychrome IF panorama mode.
- The bandwidth measurement is now coupled to the squelch value if the squelch function is activated.
- The binary memory contents contain an enumeration data type to define the demodulation bandwidth. The three new demodulation filters (8.33 kHz, 25 kHz and 75 kHz) are added in the row of ascending filter bandwidth. As a consequence, the enumeration type is no longer compatible with older firmware versions.

4.7.4 Problems Solved

- With polychrome mode set to HISTOGRAM and a 100% time value below 50 ms, the spectrum disappeared. This problem has been solved.
- With PSCAN and field strength data output via MTRACE and more than 100 channels within the PSCAN hop, the field strength measurement values were not correct. This problem has been solved.
- The field strength measurement works now also correctly for a demodulation frequency which is not in the middle of the IF panorama span.
- The accuracy of PEAK and AVG level measurement has been improved.
- The behavior of the peak detector during raise time has been improved.
- With measure mode periodic, very small measure time (e.g. 1ms), squelch function on and narrow demodulation bandwidth (bw <= 15 kHz), the audio was crackling. This problem has been solved.
- After a few days of full stress testing a system halt could occur due to an internal timer problem. This problem has been solved.
- The accuracy of DDC level measurement within 20MHz span has been improved.
- With an IF panorama span of 10 MHz or 20 MHz, a selected demodulation bandwidth below 5 MHz and the demodulation frequency set to the left border of the IF panorama, the measured level had a deviation of up to 7 dB. This problem has been solved.
- The audio was disturbed in measure mode periodic if the bandwidth measurement was activated and additional functions like RDS, stereo or noise reduction were used at the same time. This problem has been solved.
- With activated polychrome IF panorama and slow data line, the TCP data stream between the device and external GUI lost synchronization after a while. This problem has been solved.
- If a TCP data stream was configured and deleted again and a UDP data stream was subsequently configured under certain circumstances, the TCP socked was closed. This problem has been solved.
- During MSCAN the modulation measurement values were too high with noise similar signals. This problem has been solved.
- The signal for DF antenna active / passive switching has been inverted.
- The TV picture was sometimes disturbed by dots. This problem has been solved.
- The DDC level measurement did not work with measure mode "periodic". This problem has been solved.
- The reset maximum function for IITU measurement values now works properly.
- The MSCAN speed was too slow with ADC Board equipped and activated DDCs. This problem has been solved.
- After refreshing the list of peripherals, an RX antenna is now selected again correctly.
- The maximum value for measured bandwidth has been increased due to the 80 MHz IF span.
- The IF panorama in modes "max hold" or "average" showed spurious distortions with short measure time and measure mode "periodic". This problem has been solved.
- With demodulation mode FM in MTRACE a PM phase deviation value was output instead of the NINF value –9.9E37 to mark an invalid value.
- With activated sensor function “DFFStrength” the result sequence after DF level was not correct in receiver mode FFM, FSCAN and MSCAN. This problem has been solved.
- The remote query command SYST:ANT:COMP? "ADD071" returned an answer string without quotation marks. This problem has been solved.

- With measure mode AUTO and peak detector the modulation depth measurement of AM+ and AM- showed wrong results. This problem has been solved.
- The bandwidth measurement with XDB set to 0 dB showed wrong results. This problem has been solved.
- The FSCAN speed was too slow and dependent on the IF panorama step. This problem has been solved.
- With polychrome IF panorama, span 20 MHz, step AUTO and FFT mode MAXHOLD and installed ADC board, the spectrum wriggled. This problem has been solved.
- With demodulation mode CW and 4 kHz demodulation bandwidth after a warm boot, the demodulation mode changed to FM and the frequency changed to default. This problem has been solved.
- After a reboot without power off the demodulation path did not work properly. This problem has been solved.
- During a panorama scan with 80 MHz panorama span and panorama scan step below 100 kHz the spectrum was sometimes shifted by 40 MHz or 80 MHz. This problem has been solved.
- During a panorama scan with 80 MHz panorama span and FFT mode CLRWRITE sporadic ghost spectra appeared in the neighboring scan hops. This problem has been solved.
- When switching the IF panorama span between 40 MHz and 80 MHz short distortions could be seen in the spectrum. This problem has been solved.
- The receiver overflow did not disappear when switching the attenuator from manual to automatic. This problem has been solved.
- The squelch function did not work properly with RMS detector and IF panorama span greater than 20 MHz. This problem has been solved.
- Depending on the selected HF tuner limit, the long test could produce wrong error messages. This problem has been solved.
- If the device was controlled via serial once after power on, the erroneous error message 1,"Device dependent error; OCXO not calibrated" was reported. This problem has been solved.

4.7.5 Known Errors and Limitations

- With devices equipped with old processor boards (product index lower than 5.xx) the video output has no function in FM mode. In this case please downgrade the firmware to V03.11.
- The GUI firmware version number and the main processor firmware number must be the same. Otherwise the new functions may be incompatible with prior versions due to function extensions made during development (e.g. additional demodulation bandwidths).
- To achieve maximum scan rates the offset measurement has to be switched off. Please set the parameter “Show Level, Offset or Fieldstrength” to “Level only” in the SETUP – CONFIG- Panels dialog.
- After a firmware downgrade, the device may not function anymore because the older firmware will not recognize the new hardware.
- GPS 1s pulse is not used.
- With an IF bandwidth of 12.5 MHz and 15 MHz and video via LAN, the sampling rate is 160 ksps instead of 640 ksps, as with other IF bandwidths. The analog video or IF output does not work with 12.5 MHz and 15 MHz.
- Simultaneous data output via LAN of video panorama and IQ data is only possible up to 8 MHz bandwidth. With bandwidths greater than 8 MHz only IQ data is available.
- Direction finding is not available with 40 or 80 MHz IF panorama span.
- With option board DDF255-ADC, the wideband output X21 is no longer available.
- Due to hardware limitations only the first 1000 memory channels are stored nonvolatile. To store channels 1001 to 9999, the internal or external GUI “PRESET Profile” function can be used.

4.8 DDF255 GUI V03.50 dated January 13,2011

4.8.1 New Features

- Time synchronization via the GPS NMEA protocol is now supported. If the source selector for location and time is set to GPS (remote command: SYSTem:GPS:DATA:AUTO ON), the first valid NMEA protocol received sets the clock.
- A new read-only parameter shows the origin of the last clock setting. The following origins are possible: Manual (via GUI or remote command SYSTem:TIME), Real time clock (after power on) or GPS. The corresponding remote command SYSTem:CLOCk:ORIGin? delivers MAN, BAC or GPS.
- Three additional demodulation filters with 8.33 kHz, 25 kHz and 75 kHz bandwidth, respectively, are now available. The 8.33 kHz and 25 kHz filters are a special design for air traffic control communications according to ETSI EN 300676-1.
- The origin of the receiver clock setting is displayed in the SETUP-CONFIG-TIME dialog.
- Pass band tuning is now available. Please set the parameter “Pass Band Tuning” in dialog SETUP – CONFIG - Audio.
- Level display in dBm: The global unit for levels can now also be switched to dBm.
- Level differences are indicated in dB.
- New frequency panel layouts: The default layout is the new layout "Level Only" since deviation measurement is turned off in this layout.
- Inverse audio in modes FM and PM.
- Generation and export of status reports.
- Export and import of the current receiver configuration.
- Saving of the entire receiver configuration.
- Indication of service mode.
- The demodulation volume and mute condition are indicated in the upper right-hand icon panel.
- A loaded memory channel is indicated in the upper right-hand icon panel.
- Azimuth histogram: A histogram shown to the right of the azimuth panel can be turned on for this panel. The range of the histogram can be defined using the X1 and X2 markers.
- The DF application now allows changing the polarization via a softkey as well.
- Quality can be indicated at the demodulation ruler.
- DF history: Data is recorded for the DF panorama, the azimuth panel and the polar panel.
- The current DDC's frequency can be rounded to the spannel chacing by pressing the ROLLKEY.
- For the differential mode during a scan, the default spectrum drawn is a line spectrum.
- Markers passing each other.
- Identification of the Y markers by optional labels.
- The labels of the waterfall Y markers include the time measured.
- Indication of the maximum level in the ITU panel.

4.8.2 Improvements

- The marker selection remains even after a focus change.
- Snapshot printing is now also available for the DIN A3 format.
- The version of the keyboard controller FPC2 is now displayed.
- Faulty saving of memory channels (SAVE) during PSCAN is no longer possible.
- During PSCAN, there is an error message when a test is initiated.
- The erroneous error message "Not During Scan" upon GUI start-up while the receiver is already scanning is no longer displayed.
- The "MEM SELECT" softkey shows the station name.
- The field-strength indication in the frequency panel has been enlarged.
- The white history X marker can only be positioned within the displayed spectrum.
- The X history marker can be labeled.
- The Y axis in the spectrum has sufficient scale marks.
- The indicated unit for the Y axis no longer hides the scale labeling.
- The zero value is shown on the Y axis of the spectrum.
- The highest and lowest levels of the Y axes in the panorama can no longer be set to an identical value.
- The labeling of the X axis for the DF panorama matches the labeling used in the IF panorama.
- The station names are indicated on the X axis of the DF panorama.
- The station names on the X axis are now legible when displayed further to the right.
- When the Y markers are initially activated in the waterfall during history mode, the upper Y marker is hidden.
- The web interface and GUI representation of selective calls are displayed along the same direction.
- The color of the selected selective calls matches the selected color scheme.
- All focusable softkeys operate with progression.
- The markers can be operated while a softkey has the focus.

4.8.3 Changes

- The smallest unit in the polar panel is Hz.
- The bearing indicator in the polar panel is now painted white if the source is the history mode.
- The full name of the compass (e.g “COMPASS_SW” instead of “SW”) is now shown in the SETUP-PERIPHERAL-COMPASS SETUP dialog to ensure compatibility with the remote interface.
- Once IF filter coefficients have been calibrated, they are used automatically.
- The file names of audio recordings of the demodulation path contain the keyword "Audio".
- A recording's duration is shown near the start recording button.
- Live audio stays on when there is a mono/stereo switchover.
- The status report contains the new versions for the ADC-Board.
- The number of compasses has been increased from 14 to 15 in the compass-related dialogs.

- If a station name is missing, the memory-channel number is used as the station name instead of the index of the station name.
- If the history mode is on and the polychrome histogram is activated, the panorama remains in history mode and does not show the improper polychrome spectra.
- The display range in the IF, RF and DF panorama has been extended to -60dBµV.
- In differential mode, the squelch marker is hidden.
- With PRESET Default, the differential mode is deactivated.
- Following a scan, the RF spectrum is shown in gray.
- The IF panorama is shown in green during listen time in a scan.
- The "AZIMUTH" softkey is disabled during ruler mode "AUTO".
- The DF squelch und quality squelch controls in the polar panel can be operated using the left mouse button.
- The DF squelch control is no longer visible unless it is set to NORMAL or GATE.
- Error Message: "-360, Communication error" is no longer returned when parameters are changed while disconnected. Instead, error "-360, Communication error, Cannot connect to receiver" is reported.

4.8.4 Problems Solved

- With azimuth accuracy set to 1° in the polar panel, values from 359.5 °are now rounded to 0°.
- With small channel spacing, the description of the demodulation marker did not match the level. This problem has been solved.
- In the polar panel the display of ‘Previous Azimuth’ and ‘Deviation’ is only refreshed when values are changed.
- When changing the mid frequency in the azimuth panel, the red markers did not follow correctly. This problem has been solved.
- The GUI overwrote the compass offset which was set by other remote clients. This problem has been solved.
- When changing the ambience mode from PRINT to DAY with different operation modes (FFM, Scan Stop), the displayed RF waterfall was refreshed and remained white. This problem has been solved.
- With ambience mode PRINT, max hold was not visible in IF, RF or DF spectrum.
- When changing the azimuth ruler very fast, the cross-hairs in the azimuth panel sometimes was not set to the cross position of azimuth marker and demodulation frequency marker. This problem has been solved.
- The cross-hairs in the azimuth panel was jumping even with a constant signal. This problem has been solved.
- In DF panorama invalid DF quality values are now displayed as “---“.
- Under certain conditions after scan the frequency ruler position did not exactly match his position. This problem has been solved.
- After using the Supp+ function during a running FSCAN the suppressed bins remained painted active for a while. This problem has been solved.
- After PSCAN in the waterfall panel the Y marker and Y scale sometimes did not match. This problem has been solved.
- The external GUI crashed when switching the live audio function on and off very frequently. This problem has been solved.

- The selected DDC is now also selected in the Record & Replay dialog.
- After PRESET DEFAULT the snapshot folder is now selected properly.
- The history marker of the waterfall is only selectable in the ON mode of the history function.
- When trying to export a configuration, memory or suppress list without a given filename, the error message “... No file name specified.” is shown.
- With APP DF in DF mode and FSCAN in dwell time the IF panorama interfered with the DF panorama. In this case the IF panorama is switched off now
- Snapshot dialog: Creating a new folder works again.
- When a recording is started in the Record dialog, the status bar is reset.
- No more error messages are generated when the antenna selection in the antenna setup is changed.
- The tuning unit in the screenshot is now kHz rather than dBµV.
- The marker configuration is now properly loaded when a configuration is loaded or the GUI is started.
- The line feed mode is loaded properly when a configuration is loaded or the GUI is started.
- The status report no longer shows incorrect values for the DDC and WB option, respectively.
- Heavy flickering of the panels when changing layouts, application or operation modes has been eliminated.
- The numeric pad on the front panel can now also be used for rounding via "SHIFT + 1".
- Decrementing via the MEAS TIME softkey now works properly.
- The span selector is now updated upon installation of the WB option.
- The sensor functions are switched on again following a reconnect.
- The GUI no longer needs any start-up parameters for starting.
- There is no more error message when pressing the ROLLKEY in the video panorama or waterfall.
- The waterfall no longer "ignores" short pulses visible in the spectrum.
- With narrow channel spacing, the signal in the azimuth waterfall no longer disappears.
- The RF waterfall no longer has a scale showing only zero at the marks.
- If the difference between the highest and lowest level in the panorama is only 1dB, waterfall data is now shown as well.
- The RF waterfall coding now works properly.
- There are no more artefacts when zooming with the "hold max" function during the scan.
- PScan with a cycle count of 1 and a large span does no longer result in incomplete spectra.
- The zero position of the waterfall Y axis is always labeled "0" and does no longer show sporadic values greater than zero.
- The crosshairs of an empty waterfall is now located at the very top.
- There are no more gaps in the spectrum during FScan with CycleCount 2.
- FSCAN with activated DF sensor functions is now shown properly.
- The Y markers and Y time axis now match following activation of the history mode.
- A change between a comb and a line spectrum does no longer produce any side effects in the history mode.
- The history X markers and softkey do no longer assume different values.

- The waterfall does no longer show incorrect data during history mode when a recording is paused for a long period of time and the current mode is "Lines per Second".
- The Y axis and waterfall history now match again in mode "Lines per Second".
- When the history mode is on, the waterfall in the DF application runs in AF mode and the spectrum moves.
- The time indication matches the system time when the history mode has been activated.
- The Y markers no longer jump or move by themselves in the history mode.
- In the differential mode, the RF waterfall does no longer show incorrect colors.
- The Y markers of the spectra can assume values below -40dB in the differential mode.
- The spectrum does not flicker anymore when the frequency is changed in the differential mode.
- The unit for the panoramas' Y markers in the Y marker panel is now switched to dB in the differential mode.
- The offset in the frequency panel does no longer show incorrect values during direction finding.
- Invalid quality values in the ruler labeling are now indicated.
- The X1..4 ruler labeling in the AZ panel does no longer show the value "-1163005936°".
- Invalid DF values are always shown at the X1…X4 rulers as "---" rather than as "---°".
- The unit of the DF bandwidth in the polar panel no longer changes without reason.
- The difference indication for the Y markers shows incorrect values.
- The Y markers und IF waterfall Y scale now match.
- The labeling in the Y marker panel and the Y marker value now match in the minute range.
- The line focus in the decode panel is no longer lost when a panel receives the focus.
- "Couple all DDC Demodulation to RX" is no longer checked when the demodulation bandwidths are incorrect.

4.8.5 Known Errors and Limitations

- In the external GUI live audio does not work with the 64 bit version of Win7.
- With measure mode continuous and short pulse signals, the displayed level measurement may dither due to overlapping display update frequency fluctuation. In this case use measure mode periodic.
- To get maximum scan rates the offset measurement has to be switched off. Please set the parameter “Show Level, Offset or Fieldstrength” to “Level only” in the SETUP – CONFIG- Panels dialog.
- See previous version.

4.9 DDF255 Firmware V3.11 dated October 12,2010

4.9.1 New Features

- None

4.9.2 Improvements

- None

4.9.3 Changes

- None

4.9.4 Problems Solved

- With only a few devices a very infrequent boot or long term stability problem occurred. This problem has been overcome.

4.9.5 Known Errors and Limitations

- See previous version.
- If the device is in DF mode and then FScan or MScan is started, the scan spectrum datagrams can be inconsistent.

4.10 DDF255 GUI V3.11 dated October 12,2010

4.10.1 New Features

- None

4.10.2 Improvements

- None

4.10.3 Changes

- None

4.10.4 Problems Solved

- Only a few devices with front panel performed unwanted switching power on after shutting down the device. This problem has been solved by a new version 02.24 of the keyboard controller..

4.10.5 Known Errors and Limitations

- See previous version.
- If the device is in DF mode and FScan or MScan is started, the FScan or MScan spectrum can be displayed incorrectly.