*Important:*
*Since V2.00SP2 the default windows password is "894129"!*

*For downgrade to versions < V2.00 see separat chapter in this release notes!*

# ROHDE&SCHWARZ

Test and Measurement
Division

# Release Notes

# Firmware Release V2.40

## for R&S FSL Spectrum Analyzers

with order number: **1300.2502.xx**

### New Features of V2.20:
- Support for Power Sensors R&S NRP-Z211 and R&S NRP-Z221
- Support for Power Sensor R&S NRP-Z86

### New Features of V2.10:
- Support for new CPU board "LPCA" with order number 1206.0717.00
- Spectrum Analyzer and FSL-K7/K8: Russian language support for dialogs and softkeys added
- FSL-K30: The SCPI command 'INITiate:CONTinuous' is supported

**Release Note Revision:** 1

Printed in the Federal
Republic of Germany

# Contents

# History

| Date | Rel Note Rev | Changes |
|------|--------------|---------|
| 21. Jan 2015 | 1 | First revision for V2.40 |

# General Topics

## Prerequisite for Firmware Update

**Attention:**   **In order to ensure a correct firmware update
a minimum version 2.03 of the FSL XP Image is required.**

The XP image version is shown during start-up. When the R&S FSL splash screen appears the "XP Image Version" is shown in the top left corner. The minimum required XP image version is 2.03. (The information is also available in the registry, use regedit HKEY_LOCAL_MACHINE/Software/Image/MajorVersion and /MinorVersion. The decimal values in brackets are the valid ones. MajorVersion (2) and MinorVersion (1) means 2.01)

If the XP image version is 2.01 the "XP Image Update 2.03 for FSL" or newer is required to install before proceeding any further firmware installations. The "XP Image Update for FSL" with its own release notes can be downloaded from the R&S internet in the FSL download section. Please install the XP image update according to its release notes.

Without the minimum XP image version 2.03, the firmware update will complete without any effect and the firmware version will remain unchanged (Setup | More | System Info | Versions+Options: Table entry Instrument shows the old firmware version number)

## Firmware Update

If the XP Image Update fulfils the prerequisite (see chapter above) the firmware update can be carried out.

The firmware update set of the R&S FSL consists of one package file (with the extension .package) and the following installation files (with the extension .msi):

```
FSL.package        SA-*_FSL.msi          K30-*_FSL.msi      K91-*.msi
CO-*_FSL.msi       SP-*_FSL.msi          K72-*_FSL.msi      K92-*.msi
HW-*_FSL.msi       LXIWebIfc-*_FSL.msi   K82-*_FSL.msi
KS-*_FSL.msi       K20-*_FSL.msi         K84-*_FSL.msi
```

The * is the placeholder for a detailed version information of that file.

## Copying the installation files to the instrument

To install a new firmware version the installation files of the new version have to be copied to the instrument. This can be done in several ways:

Using a memory stick:

➢ Copy all files to a directory of the memory stick (the default path is D:\FW_UPDATE).

➢ Insert the memory stick into one of the USB sockets at the front panel of the R&S FSL.

Using the remote desktop and copying the installation files to a directory of the instrument:

➢ Connect the R&S FSL to your LAN.

➢ Start the remote desktop on your PC (C:\winnt\system32\mstsc.exe).

➢ Enter the TCP/IP address of the instrument, you want to update. Ensure that the **local resources**→**drives** option is selected and press the **Connect** button.

➢ Login to the instrument (user name and password are by default "894129". In former firmware version the password may be "123456" or "instrument").

➢ To get the TCP/IP address of the instrument, in the **Start** menu, select **Settings** → **Network Connections** → **Local Area Connection (2)** → **Properties**, select **Internet protocol (TCP/IP)** and press the **Properties** button.
An edit dialog box with the **IP address** field is displayed. The IP address consists of 4 numbers between 0 and 255.

➢ After the login, create an own directory and copy all installation files from your PC to the instrument using the explorer at the instrument (the drives of your PC are listed in the folder window of the explorer as well as the local drives of the instrument).

## Performing the firmware update on the instrument

The firmware update process is performed in the following steps:

➢ Switch the instrument on and wait until the Analyzer has resumed operation, ensure to be logged on to windows with administrator privileges. The "*Instrument*" account has these rights and can be used for carrying out the update.

➢ Press the **SETUP** hard key, go to the side menu using the **More** softkey, and press the two softkeys **Firmware Update** one after the other.
A dialog box is displayed. If necessary, change the default path to locate the installation files (enter the path name using an external keyboard or the keypad at the front panel of the instrument or use the **Browse** button).

➢ Press the **Execute** button to start the update.
The instrument firmware is shutting down and a dialog box is displayed. By default all the installation packages for the basic analyzer firmware available at the path you entered are selected.

➢ Firmware applications (e.g. FSL-K20) appear at the end of the list and can be selected with the ☑ key.

➢ Press the **Install** button.
The installation is running. After a few minutes the system will restart automatically. After the restart the firmware installation is complete.

➢ After the firmware update the UNCAL flag appears. A self alignment is necessary. Press the **SETUP** hard key, **Alignment** and the **Self Alignment** to start the alignment procedure.

➢ Depending on the previous firmware version a reconfiguration of the hardware may be required during the first start of the firmware. In this case the following message box will be displayed:
*"Start automatically reload of PCI FPGA ..."*
The update will be performed automatically.

Afterwards, a message box with the following text will be displayed:
*"Finished automatically reload of PCI FPGA. Reboot the device!"*
Now, please turn off the instrument at the rear panel.
If you have an instrument with options FSL-B30 (DC power supply) and FSL-B31 (battery pack), please switch off the instrument at the front panel too. Wait until the instrument is completely switched off.
After a few seconds, you can restart the instrument.

*For problems with firmware installation see the chapter "Appendix: Installation troubleshooting" at the end of this document.*

## Operation with and without Administrator Rights

With firmware version V2.00 (image version 3.11) and higher, the analyzer may be operated with or without administrator rights. Some administrative tasks (e.g. a firmware update or a LXI functions or network configuration) do require administrator rights.

In the default configuration, auto login is enabled, and the *"Instrument"* account with administrator rights is active. This means that no password is required, and the full functionality of the analyzer is available. An additional user account (user name "*NormalUser*" with default password *"894129"* or *"123456"* with former firmware versions) is predefined. Use standard Windows functionality if you wish to deactivate the auto login mechanism and activate the *NormalUser* account.

An update from a firmware version <V2.00 to version V2.00 or higher does not replace the XP-image. Meaning only a firmware update will not offer the functionality to the *"NormalUser"*. To replace the image version, contact your R&S service representative. Prerequisite is a front module controller LPC8 which can be recognized with the Bios version V6.0.xx.yy.

Note:
The FSL 1300.2502.14 will not support the operation without administrator rights.

## Downgrade to a version < 2.00

A downgrade of the firmware from V2.00 or greater to version <V2.00 requires the following process:

➢ Ensure to be logged in with administrator rights (user "Instrument")

➢ Exit the firmware with ALT-F4

➢ Select **Windows Start Menu -> Programs -> Accessories -> Backgrade** to start the back grade preparation in the registry. Accept the message box to allow that registry settings to be performed.

➢ Perform the firmware installation of the firmware with version < V2.00 using the Instrument Update Tool under **Windows Start Menu -> Programs -> Accessories -> FSLUpdateTool**

# Firmware installation of the R&S FSL-K7 analog demodulator, R&S FSL-K8 BLUETOOTH Analyzer software, R&S FSL-K9 power sensor measurement and R&S FSL-K14 spectrogram measurement

The R&S FSL-K7, R&S FSL-K8, R&S FSL-K9 and R&S FSL-K14 application software packages are included in the basic instrument firmware. Therefore they do not need a separate firmware update procedure.

# Firmware installation of the R&S FSL-K20/K72/K82/K84/K91/K91n/ K92/K93/LxiClassC

As mentioned in the firmware update description above, these applications have their own installation file and are therefore added to the selection list. Simply check it with the ☑ key if their installation is requested.

Note:
Since version 1.90 there is a different LXI package in the installation. The old LXI package will be disabled by a red cross by default. The new one can be selected with the ☑ key if required.

Note:
The functionality of the FSL-K91n is integrated within the K91 and the functionality of the FSL-K93 is integrated within the K92 msi file and they are activated by their own key codes.

## Compatibility of R&S FSL-K20/K30/K72/K82/K91/K91n/K92/K93

The compatibility of these firmware options is checked with the installation tool. If a non compatible version of the basic instrument firmware is installed the options will be deleted.
R&S FSL V2.40 is compatible to the following firmware option releases:

| R&S FSL-K20 | R&S FSL-K30 | R&S FSL-K72 | R&S FSL-K82 | R&S FSL-K84 | R&S FSL-K91/K91n | R&S FSL-K92/K93 |
|:---:|:---:|:---:|:---:|:---:|:---:|:---:|
| 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 | 2.20 |

### Enabling options via option key code entry

This section can be skipped if the option key was entered once.
For activation of application software packages a license key for validation must be entered. The license key is in the device certificate or delivered as a part of the software package. The process is performed in the following steps:

➢ Press the **SETUP** hard key, go to the side menu using the **More** softkey, and press the **Option Licenses** softkey and then the **Install Option** softkey.
A dialog box is displayed.

➢ Enter the option key number using the keypad.

➢ Press **ENTER**.
On a successful validation the message **option key valid** is displayed. If the validation failed, the option software is not installed.

# New Functions

The version numbers indicate the version in which the new function was introduced:

| Version | Function |
|---|---|
| V2.20 | Support for Power Sensors R&S NRP-Z211 and R&S NRP-Z221 |
| V2.20 | Support for Power Sensors R&S NRP-Z86 |
| V2.10 | Support for new CPU board "LPCA" with order number 1206.0717.00 |
| V2.10 | Spectrum Analyzer and FSL-K7/K8: Russian language support for dialogs and softkeys was added.<br>To change the language please use the hardkey "SETUP", then the 6th softkey "General Setup", then the 7th softkey "More" and the 2nd softkey "Language". After selecting the language a reboot of the device is necessary. |
| V2.10 | FSL-K30: The SCPI command 'INITiate:CONTinuous' is supported |

# Modified Functions

The version numbers indicate the version in which the modification was carried out.

| Version | Function |
|---|---|
| V2.40 | Modified synthesizer setup tables. |
| V2.30 | Modified synthesizer setup tables. |
| V2.30 | FSL18: Modified self alignment for levels above 6 GHz. |
| V2.00SP3 | Modified synthesizer setup tables. |
| V2.00SP2 | For some frequencies the marker signal count reading on the display had too many digits. It is now limited to the accuracy of 1Hz. |
| V2.00SP2 | The "instrument" account password was changed from "123456" to "894129" for security reasons. |
| V2.00SP2 | FSL-K20 (CATV): The calculation of the noise floor correction for the C/N quiet line measurement has been improved. |
| V2.00SP1 | FSL-K30: the SCPI command 'STATus:QUEStionable:CORRection' has been modified to provide information about missing LOSS or ENR values. |
| V2.00SP2 | FSL-K91: Peak Vector Error measurement results can be configured for 802.11b and G measurements to be measured across all symbols or the PSDU only. |
| V2.00SP1 | Default shutdown changed from "Off" to "Standby". |
| V2.00 | The auto run function for USB memory sticks or other USB mass memory devices is disabled. |
| V2.00 | The remote command `TRACe:COPY` worked different in comparison with the R&S FSP and the manual description of the FSL:<br>The first operand is the destination of the data to be copied, the second operand describes the source.<br>The command `TRAC:COPY TRACE1,TRACE2` copies the TRACE2 to TRACE1. |
| V2.00 | Modified synthesizer setup tables for FSL18. |
| V2.00 | FSL-K8: EDR Carrier Frequency Stability and Modulation Accuracy: The calculation of the initial frequency error has been adjusted - the transition bits of the GFSK header are no longer evaluated. |
| V2.00 | FSL-K20 (CATV):<br>Signal level offset now works as reference level offset in spectrum analyzer mode. Up to now, only the grid position was adjusted, but from now on the measurement results are affected, too. |

# Improvements in V2.40

The version number indicates the version in which the issue was observed for the first time.

| Version | Function |
|---|---|
| V2.00 | In some cases the instrument showed "No UDC ISR" message box at startup. This issue is solved. |
| V1.81 | In some cases the instrument did not startup with battery pack. This issue is solved. |

# Improvements in V2.30

The version number indicates the version in which the issue was observed for the first time.

| Version | Function |
|---|---|
| V2.00 | FSL18 with tracking generator: Sporadically the tracking generator and receiver frequency were misaligned. This issue is solved. |
| V2.00 | After changing from remote to local mode traces in max hold mode were reset. This issue is solved. |
| V1.81 | FSL with tracking generator and normalized traces: Limit line check result may display wrong result if unit dBµV was used. This issue is solved. |
| V2.00 | After recalling a file the auto naming function of the next save procedure was reset to the file name "Save" instead of using the name previously selected by the user. |
| V2.10 | External Monitor with CPU board part number 1206.0717.00 (LPCA): The softkey to switch to the external monitor connector did not work. This issue is solved. |

# Improvements in V2.20/2.10

The version number indicates the version in which the issue was observed for the first time.

| Version | Function |
|---|---|
| V2.00SP3 | Only FSL18: In some cases the standby via the front panel on/off key did not complete the standby procedure. This issue is solved. |
| V2.00 | The center frequency from the last SPAN measurement was not overtaken in all conditions into a following ZERO SPAN measurement. This issue is solved. |
| V2.00SP3 | Recalling certain savesets created with an FSL18 failed. This issue is solved. |

# Improvements in V2.00SP1-3

The version numbers indicate the version in which the issue was observed for the first time.

| Version | Function |
|---|---|
| V2.00SP3 | FSL18: Level reading corrected in zero span at 15.8 GHz. |
| V2.00SP3 | Restarting of FSL after 4s emergency shut down from the front on/off key corrected. |
| V2.00 | Backgrade process from version >= 2.00 to a version <2.00 lead to a wrong path setting for save sets and print outs. Also the FSL-K92/K93 could not measure due to this reason. Upgrade to this new version and then downgrade will solve the problem. |
| V1.80 | Harmonic distortion measurement: Improved THD calculation. |
| V2.00 | FSL-K20 (CATV): Analog and digital spectrum measurements. When switching the trace view mode, sometimes an additional sweep with clear/write mode was executed. This issue is solved. |
| V2.00 | FSL-K20 (CATV): When switching the unit within the tables of C/N, CTB, CSO, the measurements could stop sweeping, This issue is solved. |

| Version | Function |
|---------|----------|
| V1.90 | FSL-K20 (CATV): If once the softkey "RF = Mkr Freq" was unavailable, it stayed unavailable always. This issue is solved. |
| V2.00 | FSL-K30: The LOSS and ENR tables were slow to fill through SCPI commands. This issue is solved. |
| V2.00 | FSL-K30: For Fixed LO measurements frequencies in the LOSS Out table were incorrectly checked against RF Frequencies. This issue is solved. |
| V2.00 | FSL-K30: The calibrated status was sometimes incorrectly restored after recalling a saved file from outside K30. This issue is solved. |
| V2.00 | FSL-K91: Updates to ensure the receive filter is correctly used when processing 802.11b & g results |
| V2.00 | FSL-K91 & FSL-K93: Updates to ensure gating works in the SEM measurement for all SEM xml file settings. |
| V2.01 | FSL-K93: Help pages were not available. This problem is solved. |
| V1.70 | C/N0 measurement: the result display was truncated, so the leading digit for values from 100 dBc/Hz onwards was not displayed correctly. This issue is solved. |
| V2.00 | With an active transducer factor in the unit dBµA an offset was added to the reference level after change. This issue is solved. |
| V1.70 | Marker Peak List: In case of totally identically peak level values in a measurement only one was entered in the peak list. This issue is solved. |
| V1.90 | Switch on sequence for preamplifier improved. |
| V2.00 | SEM measurement: The remote command `:CALC:LIM1:FAIL?` for query the limit line results returned always 0. This issue is solved. |
| V2.00 | FSL-K14: The spectrogram with detector RMS or Average and sweep points > 501 just showed one color. This issue is solved. |
| V2.00 | FSL-K20: A recall from the base instrument to the K20 sometimes did not work if the "Recall File" button was used. The "Enter" key always worked. |
| V2.00 | FSL-K20: In the CSO Off Service mesasurement, the marker was not always automatically positioned to the peak value of the curve. |
| V2.00 | FSL-K20: C/N measurement: after switching to an analog standard with a noise reference band width not equal to the default of 5 MHz, the first channel was sometimes measured with the default reference band width. This issue is solved. |

# Known Issues

The version numbers indicate the version in which the issue was observed for the first time.

| Version | Function |
|---------|----------|
| V2.00 | Downgrade from a firmware version > V2.00 to a firmware version < V2.00 will not work. The firmware does not start. This is normal because of the change for the user without administrator rights. See chapter „Downgrade to a version < 2.00" in this release notes for the correct steps to downgrade. |
| V1.30 | With some save sets containing trace information, the traces are only properly shown if the set is restored after a preset. |
| V2.00 | FSL-K82 (cdma2000 BTS Analyzer) and FSL-K84 (1xEV-DO BTS Analyzer): Save sets of software-versions before 2.00 can not be recalled. |
| V1.81 | FSL-K91 and R&S FSL devices with mother board 2112.1800.02: Trace pixels in capture buffer and PVT display with values below (RefLevel-60dB) may be displayed wrong (to low). |

# Modifications to the Documentation

The new and modified functions mentioned in these release notes are already documented. Except the below mentioned last minute changes you can find the description including remote commands in the online help or in the manual. The manual can be downloaded from the internet under: http://www.rohde-schwarz.com. Select DOWNLOAD and search for FSL within the category MANUAL.

## Last minute changes to the operating manual

### Local Lockout via VXI-11 possible

The following commands allows the local lockout and go to local also via the VXI-11 interface:
**SYSTem:KLOCk <State>**
This command activates the local lockout (remote control) or returns to the local mode.

| | |
|---|---|
| **Parameters:** | ON  | OFF |
| | ON :  LLO (local lockout) |
| | OFF:  GTL (go to local) |
| **Example:** | `"SYST:KLOC ON"` // Activates LLO (remote control**)** |
| **Mode:** | A |

### MMEMory:CATalog:LONG? <path>

This command displays extended information on the files contained in the current or specified directory.
This command is an event and therefore has no *RST value and no query.

**Return values:**
 <total number of bytes the directory contains>,<Remaining disk space in bytes>"<File name1>, <suffix1>, <Length of file 1 in bytes>","<File name 2>, <suffix2>, <Length of file2 in bytes>",...,"<File name n>, <suffix n>, <Length of file n in bytes>"
 The response value consists of a list of strings, separated by commas. It begins with the total number of bytes the directory contains. Then the information for each file is returned. The <suffix> may be DIR (directory), ASCii (ASCII file) or BINary (binary file):

**Query parameters:**
 DOS Path name
 The path name should be in conformance with DOS conventions and may also include the drive name.
 Following this value, for each file, a string is listed according to the following syntax:
 "<File name>, <suffix>, <Length of file in bytes>"

**Example:**
 `MMEM:CAT:LONG? 'C:\R_S\Instr\user`
 Returns all files in C:\R_S\Instr\user:
 `1776,3331993600, "autolog.txt,ASC,1520", "autologin.reg,BIN,144",`
 `"no_autologin.reg,BIN, 112"`
 Query for the current directory:
 `MMEM:CDIR?`
 Response:
 `C:\R_S\Instr\user`

| | |
|---|---|
| **Usage:** | Query only |
| **Mode:** | A |

## SYSTem:SHUTdown

This command terminates the firmware and shuts down the Windows system of the instrument.
ATTENTION: Unsaved data will be lost. The shut down will happen immediately without further queries.

## FSL-B5: Video Out Legacy support

For devices with FSL-B5 and mother board 2112.1800 the softkey under Setup -> General Setup -> More -> Video Out Legacy ON /OFF will provide in the ON state the same behaviour of the Video Out as FSL with the previous mother board 1300.3080. This value is not taking part at preset or save recall

**Remote operation**

**OUTPut:VIDeo:LEGacy <State>**
For devices with FSL-B5 and mother board 2112.1800 this command will provide in the ON state the same behaviour of the Video Out as FSL with the previous mother board 1300.3080. This value is not taking part at preset or save recall

|  |  |  |
|---|---|---|
| **Parameter:** | ON \| OFF | |
| **Example:** | `"OUTP:VID:LEG ON"` // switches the video legacy mode on | |
| **Characteristics:** | *RST value: | (no influence on this parameter, factory default OFF) |
| | SCPI: | device-specific |
| **Mode:** | A | |

## FSL-K30: The SCPI command 'STATus:QUEStionable:CORRection' has been modified

**STATus:QUEStionable:CORRection Register**
This register comprises information about the correction state of noise measurements. It can be queried by STATus:QUEStionable:CONDition? and STATus:QUEStionable[:EVENt]? commands.

| Bit No | Meaning |
|---|---|
| 0 | **NO CORRection**<br>1 User calibration is required (i.e. not done, or setup changed). Will remain 1 until a user calibration is done. Set to 1 at the start of a user calibration. It will go to 0 at the end of a user calibration only if at least all points on one range have been calibrated. Initial value is 1. |
| 1 | Unused |
| 2 | Deprecated, unused |
| 3 | **Missing Loss or ENR values**<br>No ENR, Loss In and/or Loss Out can be determined for one or all of the measurement frequencies. This occurs when using tables of ENR, Loss In and/or Loss out values. Check that the frequency ranges of the tables covers the range of frequencies to be measured. For each measurement frequency where ENR, Loss In or Loss Out cannot be determined 0 is used |
| 4 to 15 | Unused |

## FSL-K30: Single Frequency measurement

Single Frequency measurements give access to the functionalities of Frequency List measurements for quick measurements at one particular frequency: only one frequency has to be set before running the measurement and the measurement is performed at this frequency only. As with Frequency List measurements measurement at this frequency can be done once (Single measurements) or continuously (Continuous measurements).

Single Frequency measurements are run:

- by checking the Single Freq checkbox in the Frequency Settings dialog and then choosing the type of execution by pressing the Run Single or Run Cont Hotkey

- by using the CONFigure:FREQuency:SINGle or CONFigure:FREQuency:CONTinuous SCPI command and then INITiate

The frequency the measurement is done at can be set in the Start Frequency field in the Frequency Settings dialog.
If the Single Frequency measurement is selected Start and Stop frequencies are always identical and the list reduced to one element, allowing to quickly run a measurement at one specific frequency. The Stop and Step Frequency fields are disabled and the Stop Frequency follows changes made to the Start Frequency.

The result is displayed in the Result List, limiting the list to one element.
However in this mode the graphical display is disabled and remains blank.

**Remote operation**

**CONFigure:FREQuency:CONTinuous**

This remote control command configures R&S FS-K30 for a continuous frequency measurement (continuous measurement at one single frequency as opposed to frequency list measurements). After this command has been executed a continuous frequency measurement will be the measurement started when the user issues the INITiate command.

**Example**:                                    "CONF:FREQ:CONT"         R&S FS-K30 is configured to run continuous frequency measurements.

**Characteristics:**        *RST value:              -
                             SCPI:                    device-specific

This command is an event and is therefore not assigned an *RST value and has no query.

**CONFigure:FREQuency:SINGle**

This remote control command configures R&S FS-K30 for a single frequency measurement (single measurement at one single frequency as opposed to frequency list measurements). After this command has been executed a single frequency measurement will be the measurement started when the user issues the INITiate command.

**Example**:                                    "CONF:FREQ:SING"         R&S FS-K30 is configured to run single frequency measurements.

**Characteristics:**        *RST value:           -
SCPI:                             device-specific

This command is an event and is therefore not assigned an *RST value and has no query.

# New soft key for opening windows start menu

Under **Setup** -> **General Setup** -> **More** the new soft key **Open Start Menu** is available and it opens the Windows Start Menu.

# Remote Commands for FSL-K93 V2.01 extensions

**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:RPTYpe**
This command sets the type of the reference power for the 'sub frame length' calculation.  The following types are available:
RMS    The reference power is relative to the RMS power of the sub frame.
PEAK   The reference power is relative to the peak power of the sub frame.
USER   The reference power is user-defined.

**Example:**          "CALC:MARK:FUNC:TTC:RPTY RMS"
                      "CALC:MARK:FUNC:TTC:RPTY PEAK"
                      "CALC:MARK:FUNC:TTC:RPTY USER"

**Characteristics:**  *RST value:  RMS
  SCPI:  device-specific
**Mode:**  K93


**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:RPOWer**
This command sets the reference power of the 'sub frame length' calculation in the case that the reference power type is USER.

**Example:**  "CALC:MARK:FUNC:TTC:RPOW -20"
**Characteristics:**  *RST value:  0
  SCPI:  device-specific
**Mode:**  K93


**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:RPOType**
This command sets the type of the reference power offset of the 'sub frame length' calculation. The following types are available:
PSN  The offset is calculated as a percentage of the "EVM Data and Pilots" result.
USER  The offset is user-defined.

**Example:**  "CALC:MARK:FUNC:TTC:RPOT PSN"

  "CALC:MARK:FUNC:TTC:RPOT USER"
**Characteristics:**  *RST value:  PSN
  SCPI:  device-specific
**Mode:**  K93


**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:RPOFfset**
This command sets the reference power offset of the 'sub frame length' calculation.

**Example:**  "CALC:MARK:FUNC:TTC:RPOF 5"
**Characteristics:**  *RST value:  5
  SCPI:  device-specific
**Mode:**  K93


**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:AVERaging**
This command sets the smoothing factor of the 'sub frame length' calculation. It may only be odd.

**Example:**  "CALC:MARK:FUNC:TTC:AVER 129"
**Characteristics:**  *RST value:  11
  SCPI:  device-specific
**Mode:**  K93


**CALCulate<1|2>:MARKer<1>:FUNCtion:TTCapture:LENGth?**
This command returns the result of the 'sub frame length' calculation.

**Example:**  "CALC:MARK:FUNC:TTC:LENG?"
**Characteristics:**  *RST value:  0
  SCPI:  device-specific
**Mode:**  K93

**CONFigure:WIMax:Frame:IDCell**
This remote control command can be used to specify the downlink. IDCell number, which in turn is used as DL_PermBase parameter for the permutation equations to partly set the sub carrier randomizer initialisation vector.
**Example**:  "CONF:WIM:DLSFFRAMe:IDC 0"
**Characteristics:**  *RST value:  0
  SCPI:  device-specific
**Mode:**  K93


**CONFigure:WIMax:Frame:IDCell:AUTO**

This remote control command can be used to specify that IDCell number will be determined by analysis

**Example**: `"CONF:WIM:FRAMe:IDC:AUTO 0"`

**Characteristics:**     *RST value:     0
    SCPI:                device-specific

**Mode:**     K93

## CONFigure:WIMax:FRAMe:PREDefmap

This remote control command can be used to configure the predefined map mode for auto demod.

- CONFig, i.e. the use of frame config

- IQDL, downlink determined by a loaded IQW file

- IQUL, uplink, determined by an IQW file

- SMU, the current SMU or equivalent generator settings are used

**Example**: `"CONF:WIM:FRAMe:PREDefmap CONFig 0"`

**Characteristics:**     *RST value:     0
    SCPI:                device-specific

**Mode:**     K93

## CONFigure:WIMax:FRAMe:ZONEtouse

This remote control command can be used to configure the zone that will be used for auto demodulation.

**Example**: `"CONF:WIM:FRAMe:ZONe LAST"`     Last zone is used
             `"CONF:WIM:FRAMe:ZONe Z2"`     Zone 2 is used

**Characteristics:**     *RST value:     0
    SCPI:                device-specific

**Mode:**     K93

## CONFigure:WIMax:DLSFrame:IDCell

Backward compatible, see CONFigure:WIMax:FRAMe:IDCell

## CONFigure:WIMax:ZONE<1…26>:CONTrol:STCConfig

This remote control specifies the space time coding.

NOSTC    No space time coding
TX1        One antenna (uplink MIMO only).
TX2        Two antennas

**Example**: `"CONF:WIM:ZONE1:CONT:STCC TX2"`

**Characteristics:**     *RST value:     0
    SCPI:                device-specific

**Mode:**     K93

## CONFigure:WIMax:ZONE<1…26>:BURSt<1...32>:CONTrol[:DATA]

This remote control command can be used to enter a burst definition that is to be associated with a specific zone. It accepts eight arguments which make up all the input settings to create a new burst.

A zone may have up to 32 bursts defined within it.

New bursts can only be appended to the end of the existing burst list. For example if 4 bursts are already defined, then the suffix required to enter a new burst is 5.

The argument list must be defined as follows:

| | |
|---|---|
| Modulation | Modulation scheme -    AUTO \| QPSK \| QPSK_1_2 \| QPSK_3_4 \| QAM16 \| QAM16_1_2 \| QAM16_3_4 \| QAM64 \| QAM64_1_2 \| QAM64_2_3 \| QAM64_3_4 \| QAM64_5_6 <br>(see *CONFigure:WIMax:ZONE<1…26>:BURSt<1...32>:FORMat* for modulation details) |
| Subchannels | Number of sub channels used by the burst (does not apply to downlink DL_MAP burst and uplink bursts) |
| Symbols | Number of symbols used by the burst (does not apply to downlink DL_MAP burst and uplink bursts) |

| | |
|---|---|
| Slot Duration | Slot duration (only applies to downlink DL_MAP burst and uplink bursts) |
| SubChannel Offset | Sub channel offset of the burst |
| Symbol Offset | Symbol offset of the burst |
| Burst Power | Defines the boosting power of the burst |
| Burst Type | Burst type - FCH \| DLMAP \| ULMAP \| DATA \| HARQ \| FASTfeedback |

**Example**:             `"CONF:WIM:ZONE1:BURS1:CONT QAM16_1_2,5,10,20,0,0,0,DATA"`
To define a 16 QAM 1/2 burst using 5 sub channels and 10 symbols.

`"CONF:WIM:ZONE1:BURS1:CONT QAM16_1_2,0,0,6,0,0,0,DLMAP"`
To define a 16 QAM 1/2 DL Map burst of 6 slots in length.

**Characteristics:**   *RST value:
SCPI:             device-specific

**Mode:**   K93

**CONFigure:WIMax:ZONE<1…26>:BURSt<1...32>:FORMat**
This remote control command can be used to specify the burst modulation format. The following formats are available:

| | |
|---|---|
| AUTO | Auto Detect – modulation is detected when the signal is analysed |
| QPSK | QPSK_1_2 |
| QPSK_1_2 | QPSK code rate 1/2 |
| QPSK_3_4 | QPSK code rate 3/4 |
| QAM16 | QAM16_1_2 |
| QAM16_1_2 | 16 QAM code rate 1/2 |
| QAM16_3_4 | 16 QAM code rate 3/4 |
| QAM64 | QAM64_1_2 |
| QAM64_1_2 | 64 QAM code rate 1/2 |
| QAM64_2_3 | 64 QAM code rate 2/3 |
| QAM64_3_4 | 64 QAM code rate 3/4 |
| QAM64_5_6 | 64 QAM code rate 5/6 |

**Example**:             `"CONF:WIM:ZONE1:BURS1:FORM` QAM64_3_4
**Characteristics:**   *RST value:
  SCPI:             device-specific
**Mode:**   K93

**[SENSe:]DEMod:FORMat[:BCONtent]:AUTo**
The remote command is used to specify for OFDM how the DSP should use its demodulation and for OFDMA whether the DSP should perform a pre-analysis to determine the Zone, Burst and Downlink sub–Channel Map for the current captured signal prior to calculating the results.
**NONE**, 'OFDM' demodulation off (Brute force mode) the specified modulation is used for all bursts.

**FIRSt**, 'OFDM' retrieve the first valid payload modulation and analyze all bursts with same modulation.
**USER**, 'OFDM' analyze all bursts carrying the modulation specified.
**ALL**, 'OFDM' analyze each burst with the first valid payload modulation found for that burst.
**SIGNal,** 'OFDMA' and 'MIMO' pre-analyze to determine the Zone, Burst and Downlink sub–Channel Map, prior to analyze for the first Zone results. Note: this setting now get translated into **DLMAP**.
**PREDefined,** 'OFDMA' and 'MIMO' analyze using the predefined Zone, Burst and Downlink sub–Channel Map for the current captured signal for the specified Zone results

**ULPHY,** 'OFDMA' and 'MIMO' The UL data burst in UL subframe is used

**ULMAP,** 'OFDMA' and 'MIMO' analyze using UL Map, pre-analyze to determine the Zone, Burst and uplink sub–Channel Map, prior to analyze for the zone specified see:
CONFig:WIMax:FRAMe:ZONEtouse.

**DLMAP,** 'OFDMA' and 'MIMO' analyze using UL Map, pre-analyze to determine the Zone, Burst and downlink  sub–Channel Map, prior to analyze for the zone specified see:
CONFig:WIMax:FRAMe:ZONEtouse.

**Example:**        `"SENSe:DEM:FORM:AUT FIRSt"`                                Specifies that the first symbol
                                                                                                                   field should be decoded.

**Characteristics:**   *RST value:    ALL
     SCPI:              device-specific
**Mode:**      K92, K93

# Appendix: Installation troubleshooting

The installation will only be carried out correctly if it is done through the firmware with **Setup | More** | **Firmware Update** as described in the "Firmware Update" section in this release notes. A second valid possibility is the usage of the update tool (FSLUpdate)

**Never try to update by starting the MSI-files directly!**
**In this case version checking is not carried out and this may lead to**
**black screens when starting up the firmware or an application.**

If such an installation problem occurs on the FSL the following procedure will completely remove the firmware and a new installation of firmware and applications is possible. Please use a USB keyboard and mouse for this procedure.

- Open DOS prompt
- Change to the following folder (please include the quotes " " due to the blank and the & sign)
  *cd "C:\Program Files\Rohde&Schwarz\Installer\"*
- Execute *FSLInstaller.exe /remove*
- Confirm with *Install* twice
- (after reboot it may happen that the driver needs to be copied again, allow this action)

- Execute *Windows Start -> Settings -> Control Panel -> Add or Remove Programs*
- Remove all R&S FSL components which are left - except the following components
  - R&S FSL Installer Utility Vx.xx
  - R&S FSL EEPROM Files Vx.xx
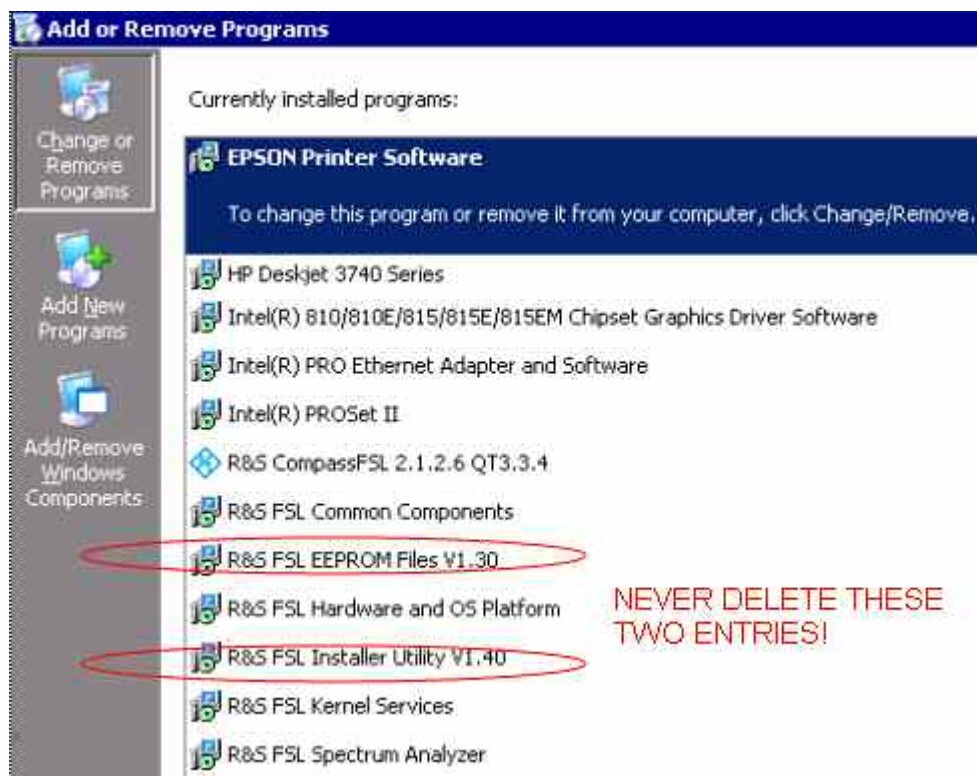


- Now execute *Windows Start->Programs->Accessories->FSLUpdateTool*
- Install firmware as described above in the "Firmware Update" section

# Appendix: Contact to our hotline

**Technical support – where and when you need it**

For quick, expert help with any Rohde & Schwarz equipment, contact one of our Customer Support Centers. A team of highly qualified engineers provides telephone support and will work with you to find a solution to your query on any aspect of the operation, programming or applications of Rohde & Schwarz equipment.

**Up-to-date information and upgrades**

To keep your instrument up-to-date and to be informed about new application notes related to your instrument, please send an e-mail to the Customer Support Center stating your instrument and your wish.

We will make sure that you get the right information.

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