Using the Digital Baseband Interface R&S® EX-IQ Box with R&S® Signal Analyzers and Agilent® ADS® Software

Application Note

Products:

| R&S®FSQ

| R&S®FSG

| R&S®FSQ-B17

| R&S®EX-IQ-Box

Your measurement task:
To analyze an RF module via its digital interface. This Application Note explains how.

As interfaces between the baseband and the RF modules of mobile radio base stations and terminals are increasingly digital, instruments for testing such modules need digital baseband interfaces as well.
The R&S®EX-IQ-Box is a digital interface adapter that provides digital baseband I/O for Rohde & Schwarz signal generators and signal analyzers. An R&S signal analyzer with digital baseband interface R&S®FSQ-B17 can analyze digital baseband components input from the R&S®EX-IQ-Box. Data collected with a test-setup consisting of an R&S signal analyzer and the digital interface adapter R&S®EX-IQ-Box can be used in an Agilent ADS environment. For details of how to input the results to ADS, see Application Note 1MA72: "Using R&S® Instruments within Agilent®ADS®Software"

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1 Abstract

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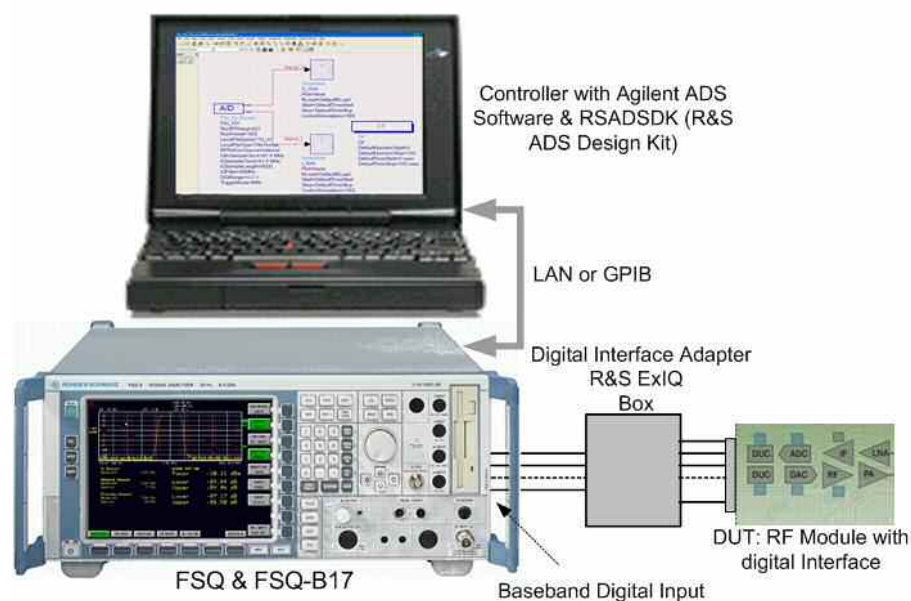

Figure 1: Test setup controlled by Agilent ADS Software with Signal Analyzer R&S FSQ with digital interface FSQ-B17, digital interface adapter R&S EX-IQ Box connected to analyzer an RF module with digital interface.

2 Setting up the Startup Recall function of the R&S®FSQ or R&S®FSG

To adapt the EX-IQ box to your specific digital interface it has to be pre-configured. Using the Startup Recall function of the R&S signal analyzer ensures that the system is in a defined default condition after a Preset command within Agilent ADS.

In the following the procedure setting up the Startup Recall function of the R&S®FSQ or R&S®FSG is described step by step. This ensures that the R&S®EX-IQ box is setup correctly by every Preset command sent to the R&S signal analyzer.

Ensure Factory Preset by selecting:
⇒ *FILE:STARTUP RECALL*

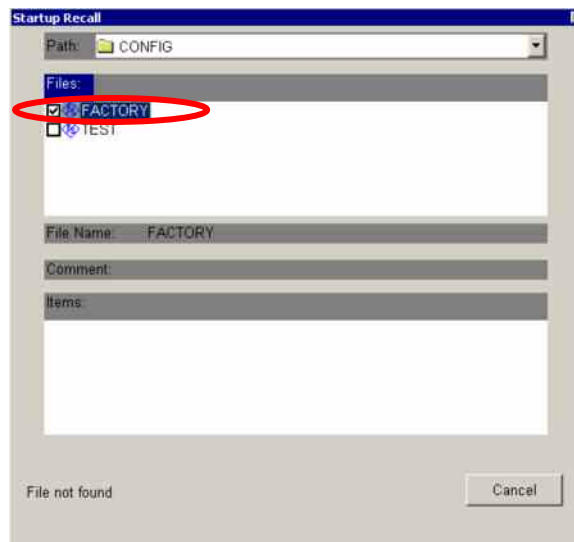*Figure 2: Selecting Startup Recall*

⇒ Mark *Factory* checkbox

Figure 3: Mark Factory checkbox as Startup Recall

⇒ *PRESET*

⇒ Setup the EX-IQ Box manually according to your needs (Base Settings, Data Settings, Clock Settings and Strobe Settings

Example for setting up the Clock Settings of the EX-IQ Box
(It is assumed that the connected device under test delivers the clock with a clock rate of 81.6 MHz, other clock settings and the base-, data- and strobe settings agree between the EX-IQ-Box and the device under test.

⇒ Select *EXIQ in the Hotkey-Bar (keys located under the measurement screen)*

⇒ Change *Clock source* to *External*
⇒ Change *Clock Rate* to *81.6E6*
⇒ Press *SEND TO*
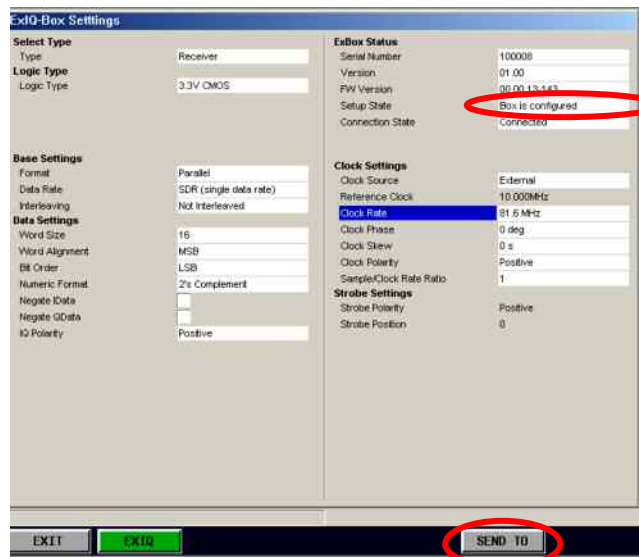⇒ *(The Setup State has to change to "Box is configured")*

Figure 4: EX-IQBox Settings, Example

⇒ Press *EXIT*
⇒ Press *FILE:SAVE*
⇒ Unselect all items except *Current Settings* and *ExIQ-Box Settings RX*
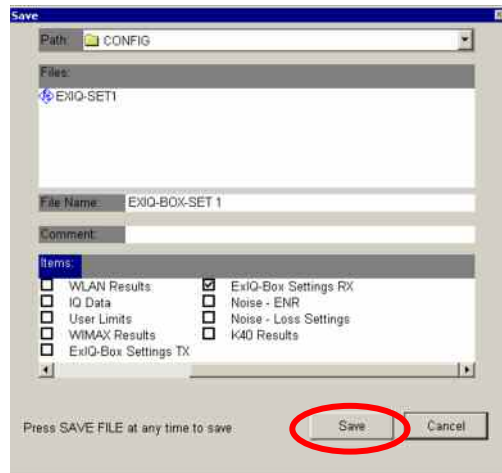⇒ Save under a suitable file name e.g."*EXIQ-SET1*"
⇒ *SAVE*

Figure 5: Only Current Settings (not visible in figure 5) and ExIQ-Box Settings RX should be marked as to be saved
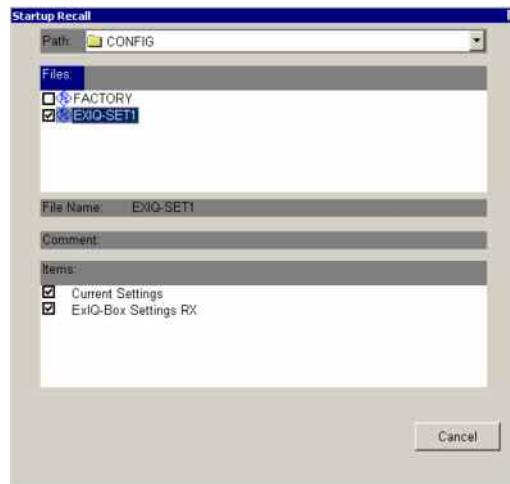
⇒ Press *STARTUP RECALL*

⇒ Select *EXIQ-SET-1*

Figure 6: Selecting former saved EXIQ-Set1 as Startup Recall

⇒ Close the dialog box by pressing *ESC* twice

The EX-IQ Box is now setup the same way at every Preset command sent to the signal analyzer used.

3 Using the R&S®EX-IQ Box with R&S®FSQ or R&S®FSG and Agilent®ADS®Software

The EX-IQ Box need not to be controlled within ADS but by the R&S®FSQ or R&S®FSG.

See below an example how the digital baseband input of the R&S®FSQ is setup within ADS.(It is assumed that a device under test is properly connected to the EX-IQ Box User Interface and the EX-IQ Box Output to the FSQ Digital Baseband input.)

With parameter RunPreset = Yes of the A/D Component FSx_IQ_Source it is ensured, that the EX-IQ box is set to the previously saved settings at every start of the simulation (By selecting Rohde&Schwarz/Start Simulation).
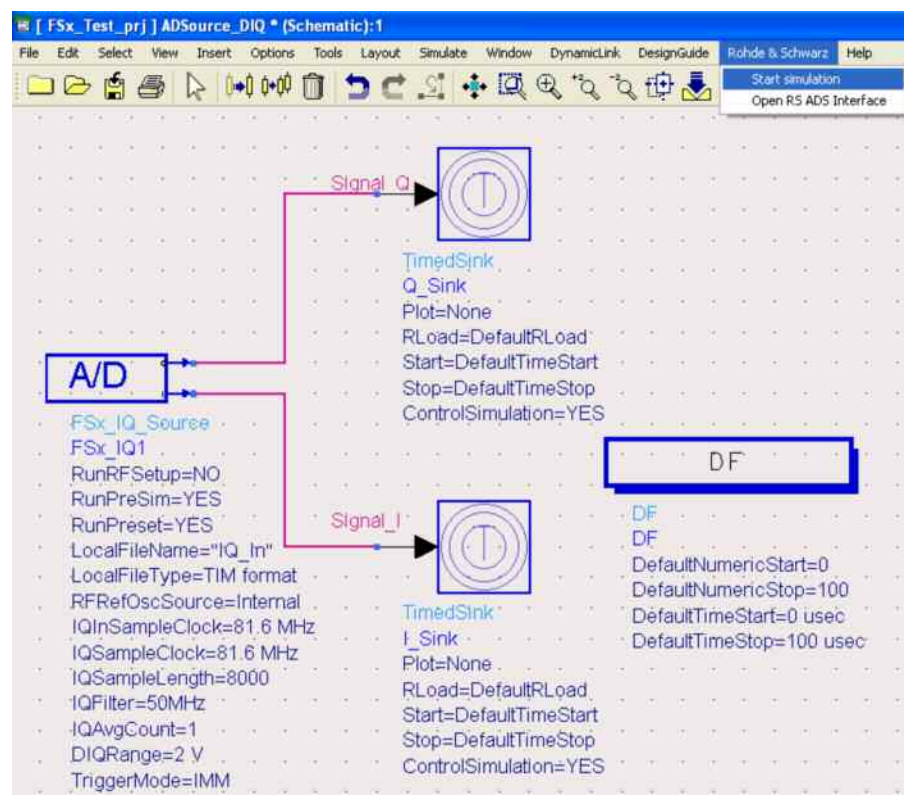

Figure 7: Schematic of [FSx_Test_prj]ADSource_DIQ within ADS Software (using the digital baseband input)

4   Literature

1. [Application Note 1MA72 "Using R&S® Instruments within Agilent®ADS®Software"](#)
2. [R&S®EX-IQ-Box Manual](#)
3. [R&S®FSQ Operating Manual](#)
4. [R&S®FSG Operating Manual](#)

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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