

# R&S®NRQ6

## VSE Feed (I/Q Capturing)

### Application Sheet



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# 1 Your Task

This application sheet describes the use of the R&S NRQ6 frequency selective RF power sensor as an I/Q data source for the software R&S VSE Vector Signal Explorer.

This application sheet describes a way to use the import capabilities of the R&S VSE software to process I/Q data captured by an R&S NRQ6. For the data exchange, standard \*.CSV files are created from the I/Q data acquired by the R&S NRQ6.

## 2 Possible Solution

If the R&S NRQ6 is equipped with the appropriate software option, it can directly output the acquired I/Q data. You specify the radio frequency (RF), the resolution bandwidth or the sample-rate and the desired number of I/Q value pairs. The R&S NRQ6 can acquire from one up to 5 million I/Q samples at 120 Mega-samples per second. [Chapter 3, "How to Configure the R&S NRQ6"](#), on page 2 shows a typical setup.

## 3 How to Configure the R&S NRQ6

### Prerequisites

To use the I/Q output capabilities of the R&S NRQ6 sensor, the device must be equipped with the R&S NRQ6-K1 option. You can purchase this add-on at any time as a supplementary option. If necessary, contact the R&S Product Marketing.

Given that the R&S NRQ6 sensor is equipped with the R&S NRQ6-K1 option, two typical configurations can be considered:

### Configuration by specifying filter-bandwidth

```

::
*RST
::
SENS:FUNC "XTIM:VOLT:IQ"      # Select IQ mode
SENS:BAND:TYPE RES           # Defines that the configuration shall be
                             # made by specifying the resolution bw
                             # (That command is redundant here, because
                             # this setting is default after *RST)
SENS:BAND:RES:TYPE:AUTO OFF  # Configuring resolution bandwidth filter
SENS:BAND:RES:TYPE FLAT     # Manual selection, for example
SENS:BAND:RES 40.0e6        # 40 MHz FLAT RBW filter
SENS:TRAC:IQ:RLEN 600000    # Requesting 600000 I/Q value pairs for the
                             # result. This corresponds to an acquisition
                             # time of 10 ms, because @ 40 MHz filter band-
```

```

# width the sensor's sample-rate is 60 MHz
::

```

### Configuration by specifying variable sample-rate

```

::
*RST
::
SENS:FUNC "XTIM:VOLT:IQ" # Select IQ mode
SENS:BAND:TYPE SRAT # Defines that the configuration shall be
# made by specifying the sample-rate
SENS:BAND:VAR ON # Activating variable sample-rate
SENS:BAND:SRAT 50000000 # Configuring the sample-rate to 50 MspS
SENS:TRAC:IQ:RLEN 500000 # Requesting 500000 I/Q value pairs for the
# result. This corresponds to an acquisition
# time of 10 ms at a sample-rate of
# 50 million samples per second
::

```

### Further settings (common for both configurations)

```

::
SENS:FREQ 2.4e9 # RF = 2.4 GHz (for example)
::
SENS:INP:ATT:AUTO OFF # De-activation of input attenuation
SENS:INP:ATT 0 # ::

TRIG:SOUR IMM # Immediate trigger

SENS:TRAC:IQ:DATA:FORM IQPAIR # Selecting output format for the I/Q data;
# here pairs of [<I><Q>] values

FORM:DATA REAL,32 # We want binary results ('float')...

INIT:IMM # Starting a measurement

FETCH? # Reading the results. This will return the
# number of configured I/Q values pairs as
# a definite length data block; for example
# 600000 * 2 * 4 bytes ('float' values)
# -> #74800000<i><q><i><q>...<i><q>

```

Chapter 5, "Learn More about the R&S NRQ6", on page 4 shows how to find usable example programs for the previously mentioned measurements. These example programs also demonstrate how to store the acquired I/Q data in a \*.CSV file for further processing by the R&S VSE software.

## 4 Additional Helpful Commands

### Checking the current sample-rate

```
SENS:TRAC:SRAT?          #    -> 6.000000E+07
```

### Checking the number of resulting I/Q value pairs

```
SENS:TRAC:RLEN?         #    -> 600000
```

### Checking whether any error occurred

```
SYST:ERR:LIST?          #    -> 0, "No error" - possible transient errors  
SYST:SERR:LIST?        #    -> 0, "No error" - possible static errors
```

## 5 Learn More about the R&S NRQ6

For a detailed description of the capabilities of the R&S NRQ6, read its user manual. The user manual also explains all aspects of remote control features in details.

Also, you can always install our basic driver and tools package called R&S NRP Toolkit. Among various tools, this package supplies an optional SDK (Software Development Kit), which contains many sample programs with full commented source code in various programming languages. On an MS Windows PC, you find the SDK after installation under:

```
C:\ProgramData\Rohde-Schwarz\NRP-Toolkit-SDK\
```

The examples especially for the R&S NRQ6 are under:

```
C:\ProgramData\Rohde-Schwarz\NRP-Toolkit-SDK\NRQ\
```

Download the latest version of the R&S NRP Toolkit at:

[www.rohde-schwarz.com/software/nrp\\_s\\_sn/](http://www.rohde-schwarz.com/software/nrp_s_sn/)