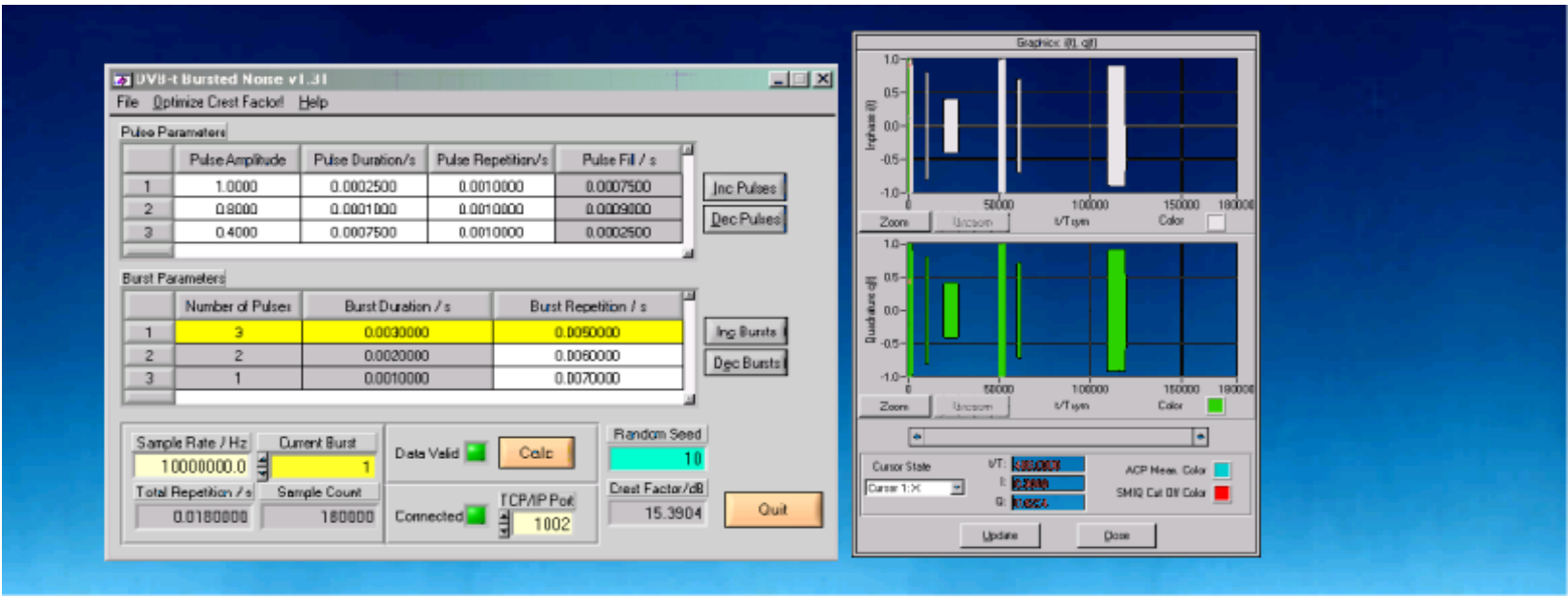

Products: SMIQ, AMIQ, FSIQ, FSP, FSU, FSEx

DVB-T
Bursted Noise
Signal Generation

Application Note

DVB-T Bursted Noise is a tool for generation of DVB-T compatible noise signals. The IQ data can be transferred to WinIQSIM for further processing and transmission to an AMIQ / SMIQ.

ROHDE&SCHWARZ

Subject to change – O.Gerlach 06.2002 - 1MA51_2E

Contents

1 Overview

DVB-T Bursted Noise is a tool for generating DVB-T (Terrestic Digital Video Broadcasting) compatible noise signals. The IQ data can tranferred to WinIQSIM for further processing and transmission to an AMIQ.

2 Software Features

The software offers:

- TCP/IP interface to WinIQSIM using one or two separate computers
- load and save program and device configuration

3 Hardware and Software Requirements

Hardware Requirements

The software runs on a PC with

- CPU: Pentium 133MHz or better
- RAM: 64 MBytes or more
- Monitor: VGA color monitor

Software Requirements

- ***Windows 95/98/NT4.0/2000***
- optional ***WinIQSim v3.50*** (or higher) installed. This is a software tool is capable of receiving IQ data via TCP/IP software interface and calculating and transferring it to an *AMIQ* I/Q modulation generator. *IQWizard* and *WinIQSim* must run simultaneously to enable data transfer. Download latest *WinIQSim* version from http://www.rohde-schwarz.com.

4 Connecting the Computer and Instrument

Connecting the instruments

Connect the computer running *DVB-T Bursted Noise* to an AMIQ, SMIQ and optionally an analyzer (FSE, FSIQ, FSP or FSU).

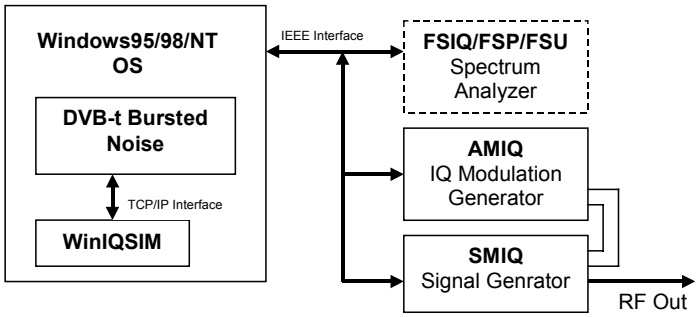

Fig. 1 Instrument Connection

5 Installing DVB-T Bursted Noise Software

You need following installation files on floppy or hard disc.

DVBTBN V1.XX.MSI

DISTFILE.CAB

Execute *DvbtBn v1.xx.msi* and select the installation directory. A new menu item ***DVB-T*** will be created in *Start -> Program Files*. The installation directory will contain the files named below:

DVBTBN.EXE	DVB-T Bursted Noise executable
DVBTBN.CFG	DVB-T Bursted Noise configuration file
DVBTBN.DOC	This file
DVBTBN.IQS	WinIQSIM configuration file

6 Basics

The bursted noise signals have following structure.

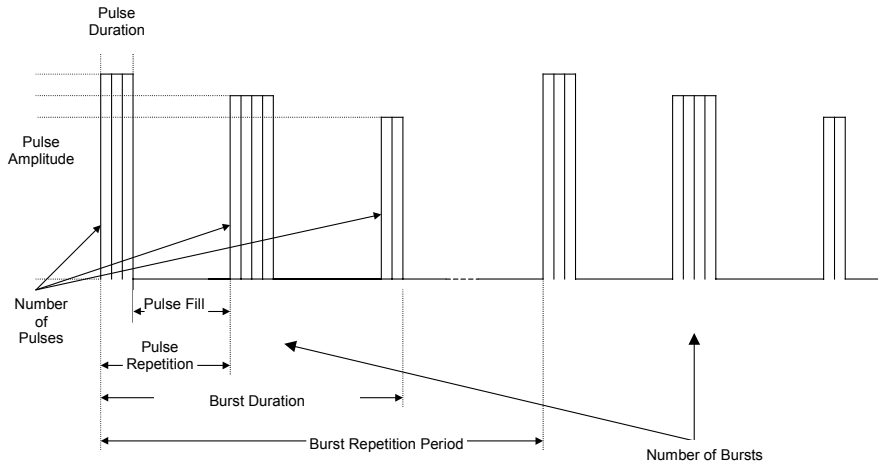

Fig 2 Basics

The variation of these parameters allows to simulate reproductable DVB-T signal interferences in order to test receiver capabilities.

7 Starting the Software / Measurement

Execute **DVBTBN.EXE** first. Then start WinIQSIM and load the **DVBTBN.IQS** configuration file. The program will come up with following or similar (depending on **DVBTBN.CFG** configuration file) start window.

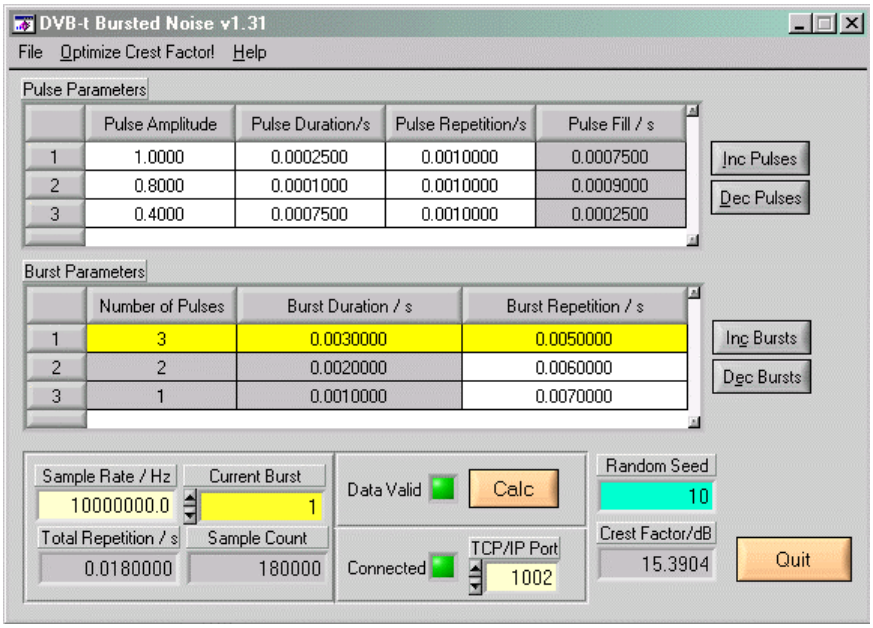

Fig. 3 Main Window

- **BURST PARAMETERS**
  - **Number of Pulses** – Indicator only (grey) for pulse count of specified burst. This value is affected by **INC PULSES** and **DEC PULSES**. Range: 1 to +inf.
  - **BURST DURATION** – Indicator only (grey) for sum of **PULSE REPETITIONS**.
  - **BURST REPETITION** – User control for time period between two consecutive bursts. Minimal value **BURST DURATION**. Upper limit restricted by AMIQ memory size.
  - **INC/DEC BURSTS** – Increments / decrements number of bursts. Minimal value: 1.
- **PULSE PARAMETERS**
  - **PULSE AMPLITUDE** – Range: 0.0 to 1.0.
  - **PULSE DURATION** – Effective pulse width. Range: 0.0 to upper limit restricted by AMIQ memory size.
  - **PULSE REPETITION** – Total time between current and consecutive pulse. Range: **PULSE DURATION** to upper limit restricted by AMIQ memory size.
  - **PULSE FILL** – Indicator only for time span between end of current pulse and start of next pulse. It is calculated as follows:

    PULSE FILL = PULSE REPETITION – PULSE DURATION
  - **INC/DEC PULSES** – Add/delete pulse to/from end of list. Minimal value: 1
- **SAMPLE RATE** – Specifies the sampling rate of the AMIQ. Valid range: 10 kHz to 105 MHz.
- **CURRENT BURST** – Active burst. Pulse parameters are updated accordingly. Range: 1 to **NUMBER OF BURSTS**.
- **TOTAL REPETITION** – Indicator only for total time span of bursted noise signal. Is calculated as:

  $\text{TOTAL REPETITION} = \text{BURST REPETITION}_1 + ... + \text{BURST REPETITION}_N$
- **SAMPLE COUNT** – Indicator only for number of samples. Is calculated as:

  SAMPLE COUNT = SAMPLE RATE * TOTAL REPETITION

  If SAMPLE COUNT exceeds maximum AMIQ memory size (16000000 samples for AMIQ-04) a red frame appears around it, indicating an AMIQ memory overrun.
- **CONNECTED** – indicator LED turns green when TCP/IP link to WinIQSIM is active.
- **CALC** – calculates two time domain arrays (I and Q data) for further pro-cessing with WinIQSIM.
- **DATA VALID** – indicator LED turns green when valid IQ data has been generated by pressing CALC.

Note: The maximum SAMPLE COUNT corresponds to the AMIQ-04. In case you have an AMIQ-03 or less, WinIQSIM will display a warning. The greyed table elements cannot be manipulated by the user.

See '*DVB-T Bursted Noise Measurement Example*' for a description of setting up *WinIQSIM*.

Menu

File

All program and device specific data may can be loaded / saved from / to a configuration file.

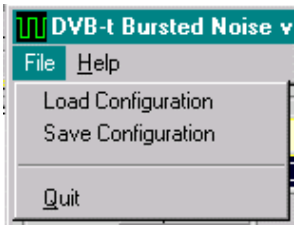

Fig. 4 Menu Items

- **LOAD CONFIGURATION** - the default file extension is **.cfg*.
- **SAVE CONFIGURATION** - the default file extension is **.cfg*. Similar file dialog as *Load Configuration*.

Optimize Crest Factor

This menu item enables calculating IQ data with varying start seeds. The min/max indexes and values are displayed so the user can choose the desires start seed on the main window.

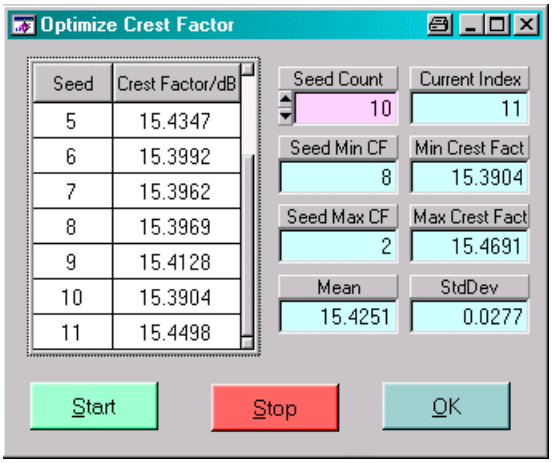

Fig. 5 Optimize Crest Factor

Note: Since two different randons arrays are generated and the I-array always starts with seed=1 the seed of the Q-array begins with 2.

Help

- **HELP** – Online help file
- **ABOUT** – displays revision and copyright information.

8 DVB-T Bursted Noise Measurement Example

- Start **DVBTBN** and **WinIQSIM** as described above. The DvbtBN example configuration **DVBTBN.CFG** is automatically loaded at startup. Setup the SMIQ and analyzer (FSP, FSU, FSIQ or FSEx) as required and load the WinIQSIM configuration file **DVBTBN.IQS**.
- Make sure you have a valid TCP/IP connection and press **CALC** in **DVBTBN**.
- Transfer the data by pressing the graphics button in WinIQSIM.

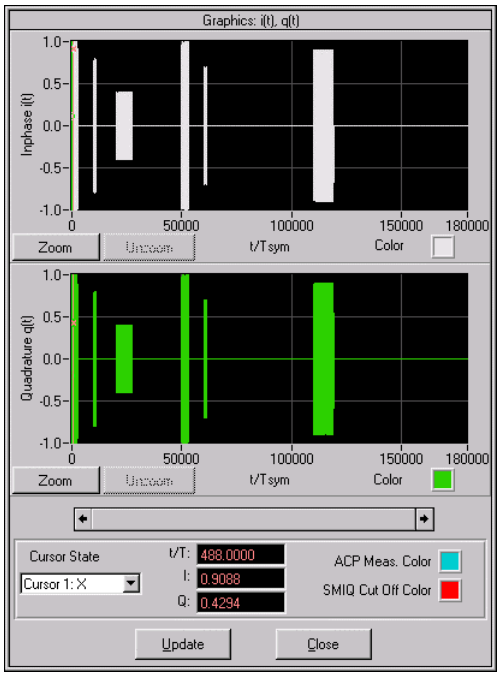

Fig. 6 WinIQSIM Graphics

- Then press the ***AMIQ Transmission -> Transmit*** button to transmit the data to the AMIQ. Be sure to check *Compensate Ouput Signal for sin(x)/x Distortion*.

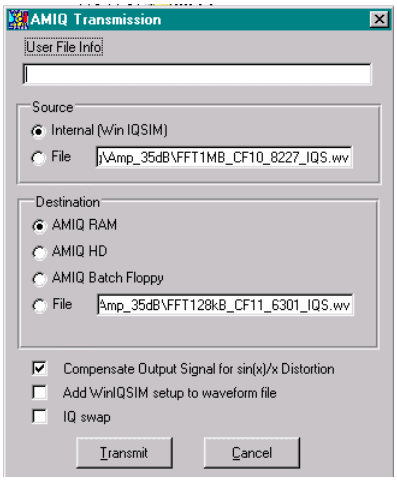

Fig. 7 AMIQ Transmission

9 Additional Information

Please contact **TM-APPLICATIONS@RSD.ROHDE-SCHWARZ.COM** for comments and further suggestions.

10 Ordering information

IQ Modulator		
AMIQ-03	(4 Msamples)	1110.2003.03
AMIQ-04	(16 MSamples)	1110.2003.04
Vector Signal Generator		
SMIQ02B	(300 kHz to 2.2 GHz)	1125.5555.02
SMIQ03B	(300 kHz to 3.3 GHz)	1125.5555.03
SMIQ04B	(300 kHz to 4.4 GHz)	1125.5555.04
SMIQ06B	(300 kHz to 6.4 GHz)	1125.5555.06
Spectrum Analyzer		
FSIQ3	(20Hz to .3.5GHz)	1119.5005.03
FSIQ7	(20Hz to .7 GHz)	1119.5005.07
FSIQ26	(20Hz to .26 GHz)	1119.6001.26
FSP3	(9 kHz to 3 GHz)	1093.4495.03
FSP7	(9 kHz to 7 GHz)	1093.4495.07
FSP13	(9 kHz to 13 GHz)	1093.4495.13
FSP30	(9 kHz to 30 GHz)	1093.4495.30
FSU3	(20 Hz to 3.6 GHz)	1129.9003.03
FSU8	(20 Hz to 8 GHz)	1129.9003.08

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