Narda IQ Stream Grabber

Contents

1 General

The IQ Stream Grabber is a WIN32 command line tool for developers. This tool is helpful to get a first impression of the IQ streaming protocol. You can make logfiles of the remote communication and record the IQ data to WAV files.

⚠	**Note**

The IQ Stream Grabber is a simple command line tool without multitasking capabilities.

To avoid communication problems like "data lost" messages, you should not move the scrolling bar in the command line window and avoid a high cpu load through other activities on your computer while communication or data output is running.

Ensure your firewall is not blocking the stream communication.

Do not use data streaming in an office network environment.

💡	**Tip**

The whole communication can be reviewed in the logfile after the IQ Stream Grabber is closed.

2 Command Line

The "NardaIQStreamGrabber.exe" is the WIN32 command line application.

This application can be called with several command line parameters.

You can call this application without parameters to see the help screen with all parameters:

```
Narda IQ Stream Grabber V1.0.2
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 Options:        PRESS Q FOR QUIT THE APPLICATION

 FCENT           Center Frequency FCENT=9E3...6E9 [Hz]
 RBW             Resolution Bandwith RBW=100...400E3 [Hz]
 ATT             Attenuator ATT=0...50 [dB]
 UNIT            Unit UNIT=V or UNIT=V/m or UNIT=A/m
 PROTOCOL        Streamlink Protocol, PROTOCOL=TCP or PROTOCOL=UDP
 LOG             Log Filename, Example: LOG=MyLogfile.txt
 WAV             Wav Filename, Example WAV=MyIqWavefile.wav

 REMOTEPORT      Remote Port for Remotelink
                 Default: REMOTEPORT=55555
 STREAMPORT      Stream Port for TCP or UDP Streamlink
                 Example: STREAMPORT=60001
 IPHOST          Host IP-Address for UDP Streamlink
                 Example: IPHOST=192.168.128.200
 IPDEVICE        Device IP-Address for Remotelink and TCP Streamlink
                 Default: IPDEVICE=192.168.128.128
```
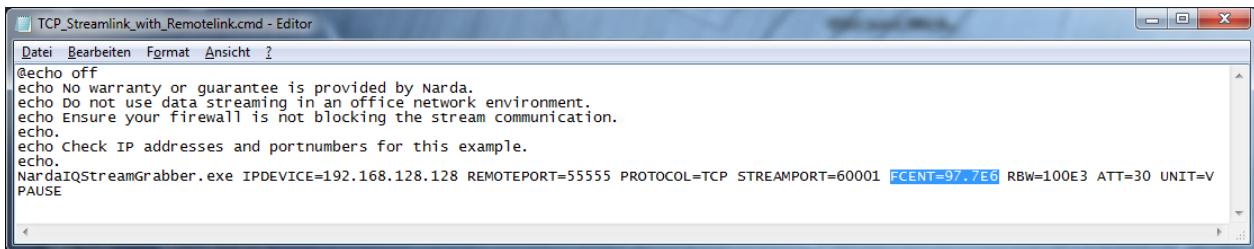
3 Command Files

You can use a command file to call "NardaIQStreamGrabber.exe" with predefined parameters.

There are command files for different connection and mode settings available.

You can change the command files with a text editor or you can create your own files.

Example: Editing a command file

List of the predefined command files:

Help.cmd	Shows the help screen
TCP_Streamlink.cmd	Connects to a TCP stream link
UDP_Streamlink.cmd	Connects to a UDP stream link
TCP_Streamlink_with_Remotelink.cmd	Connects to a TCP Remote link for setup a TCP stream mode and then connects to the stream link.
UDP_Streamlink_with_Remotelink.cmd	Connects to a TCP Remote link for setup a UDP stream mode and then connects to the stream link.

4 Remotelink Example

If you want to make a stream link and remote link with the IQ Stream Grabber you can use the TCP_Streamlink_with_Remotelink.cmd or UDP_Streamlink_with_Remotelink.cmd files.

In this case the IQ Stream Grabber has two connections to the device, the remote link and the stream link. The remote link sends commands to setup and configure the IQ streaming mode and the stream link listens to the incoming stream data.

```
>> Connecting to Remotelink: TCP:192.168.128.128:55555

>> Remotelink: REMOTE ON;
<< Remotelink: 0;
>> Remotelink: VERSION? APP;
<< Remotelink: "V2.0.0 beta6",0;
>> Remotelink: MODE IQSTREAM;
<< Remotelink: 0;
>> Remotelink: STREAM_SETUP TCP,"",60001;
<< Remotelink: 0;
>> Remotelink: UNIT V;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_FCENT 9.77e+007;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_RBW 100000;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_ATT 30;
<< Remotelink: 0;
>> Remotelink: UNIT?;
<< Remotelink: V,0;
>> Remotelink: IQSTREAM_FCENT?;
<< Remotelink: 97700000,0;
>> Remotelink: IQSTREAM_RBW?;
<< Remotelink: 100000,0;
>> Remotelink: IQSTREAM_ATT?;
<< Remotelink: 30,0;
>> Remotelink: STREAM_STATE ON;
<< Remotelink: 0;

>> Connecting to Streamlink TCP:192.168.128.128:60001

>> Connected to Streamlink TCP:192.168.128.128:60001


    ------------------------------------------------
    Device Time:        2013-04-04 15:03:33.000
    Event:              FIRST_PACKET
    ------------------------------------------------
    Packet Counter:     #1
    Integer Seconds:    1365087813
    Fractional Seconds: 0
    Event Flags:        0x40000000
    Change Flags:       0x00000000
    Data Item Format:   0x0002 [INT16]
    Unit:               0x0011 [V]
    Scale to Unit:      1.90824e-005
    Sample Rate:        100000 [Hz]
    RBW:                100000 [Hz]
    Fcent:              97700000 [Hz]
    Refernece Level:    0.225000 [V]
    Attenuator:         30 [dB]
    Temperature:        50.063 [Degree Celsius]
    Estimated Datarate: 3.051758 [MBit/s]
    ------------------------------------------------
```
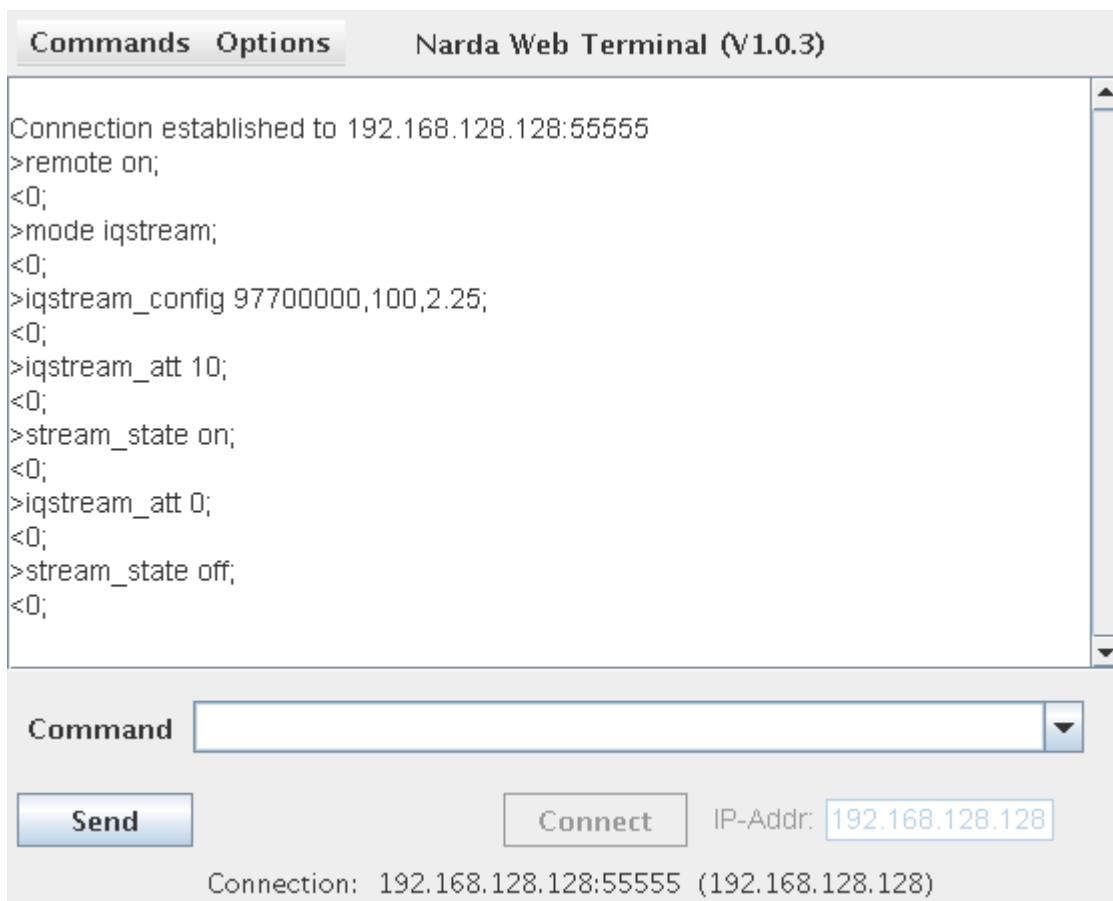
5 Narda Web Terminal Example

To configure and start the IQ stream you can use the Narda Web terminal for the remote link.

For this you must go to the device website and start the Web Terminal.

Then you can send the commands for the IQ stream mode with the Web Terminal.

To verify the stream output you can use the IQ Stream Grabber with the TCP_Streamlink.cmd or UDP_Streamlink.cmd. With these batch files the IQ Stream Grabber only listens to the incoming stream data without sending commands on the remote link.

6 Logfile Example

The logfiles shows the remote link and stream link communication.

You can activate logfile recording with the command line parameter: LOG=MyLogfile.txt

---

⚠ **Note**

You must close the application by enter 'q' or 'Q' (for Quit) to save the complete logfile.

Example Logfile:

```
>> Remotelink: REMOTE ON;
<< Remotelink: 0;
>> Remotelink: VERSION? APP;
<< Remotelink: "V2.0.0 beta6",0;
>> Remotelink: MODE IQSTREAM;
<< Remotelink: 0;
>> Remotelink: STREAM_SETUP TCP,"",60001;
<< Remotelink: 0;
>> Remotelink: UNIT V;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_FCENT 9.77e+007;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_RBW 100000;
<< Remotelink: 0;
>> Remotelink: IQSTREAM_ATT 30;
<< Remotelink: 0;
>> Remotelink: UNIT?;
<< Remotelink: V,0;
>> Remotelink: IQSTREAM_FCENT?;
<< Remotelink: 97700000,0;
>> Remotelink: IQSTREAM_RBW?;
<< Remotelink: 100000,0;
>> Remotelink: IQSTREAM_ATT?;
<< Remotelink: 30,0;
>> Remotelink: STREAM_STATE ON;
<< Remotelink: 0;
```

7 IQ-WAV Example

The IQ-WAV file saves the IQ data of the stream link to a WAV file.

You can activate wavfile recording by the command line parameter: WAV=MyIqWavfile.wav

⚠ **Note**

You must close the application by enter 'q' or 'Q' (for Quit) to save the complete IQ-WAV file.

Example IQ WAV file shown in audio editor:
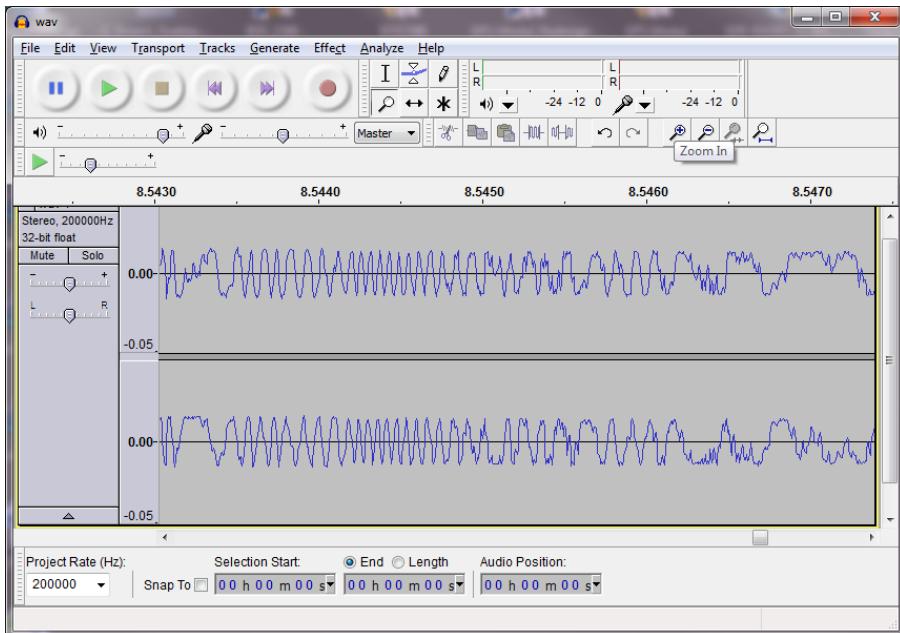
8 IQ-WAV Format

The IQ data is stored in a 2 channel stereo wave file with the following structure:

WAV Format chunk

Parameter	Type	Bytes	Description
FormatTag	Word	2	1 = WAVE_FORMAT_TAG_PCM 3 = WAVE_FORMAT_TAG_FLOAT
Channels	Word	2	2 = IQ Wave channels, I=Channel0, Q=Channel1
SampleRate	DWord	4	Equals to the RBW [Hz]
AvgBytesPerSec	DWord	4	Equals SampleRate*BlockAlign
BlockAlign	Word	2	4 = INT16 Format (WAVE_FORMAT_TAG_PCM) 8 = FLOAT32 (WAVE_FORMAT_TAG_FLOAT)
BitsPerSample	Word	2	16 = INT16 (WAVE_FORMAT_TAG_PCM) 32 = FLOAT32 (WAVE_FORMAT_TAG_FLOAT)

iq01 chunk

Parameter	Type	Bytes	Description
IntegerSeconds	DWord	4	Integer second part of the timestamp in UTC seconds since January 1, 1970 (without leap seconds).
FractionalSeconds	DWord	4	Nanosecond part of the timestamp.
EventFlags	DWord	4	0x00000001 = Indicates a ADC input Overrange 0x00000002 = Samples lost indicator 0x00000004 = measurement hardware is not settled 0x00000008 = Indicates measurement hardware error 0x40000000 = Indicates the first packet of the stream 0x80000000 = Indicates the last packet of the stream
ChangeFlags	DWord	4	The change flags are automatically reset when measurement hardware is settled. 0x00000001 = Fcent changed 0x00000002 = RL, Attenuator changed 0x00000004 = Scale to Unit value changed
DataItemFormat	Word	2	0x0002 = INT16 0x0009 = FLOAT32
Unit	Word	2	0x000A = V/m 0x000B = A/m 0x0011 = V
ScaleToUnit	Float	4	Multiply data elements with this value to convert to unit
SampleRate	Float	4	IF sample rate [Hz]
RBW	Float	4	IF bandwidth [Hz]
Fcent	Double	8	Center frequency [Hz]
RL	Float	4	Reference level (Measurement Range) [Unit]
Attenuator	Float	4	Attenuator 0…50 dB
Temperature	Float	4	Degrees °C measured on RF Hardware