NRA & IDA Utility Software

In combination with the NRA and the IDA, Narda STS provides a set of free, easy-to-use software. This application note provides a brief overview on these tools and some additional 3rd party software products.

Remark: Even though the Narda Utility Software is available for free, some of the included software tools only work when the adequate options have been activated in the NRA or IDA! Options can also be purchased later on. Further information can be found in the NRA and IDA datasheets.

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1 NRA Tools & IDA Tools

The Narda Tools Software is fundamental to configure the NRA or IDA in a customized way. The software allows the programming of antenna factors and correction values of filters and attenuators which are used with the instrument. It also provides an additional opportunity assessing the instruments saved data sets and screenshots. Moreover users can also compose individual transmitter and channel tables that are applicable in various operation modes of the NRA or the IDA.

The software is also required for firmware updates and it is able to check and set the network / LAN properties of a device. The IDA/NRA Tools Software can only be operated via USB.

2 Device Finder & Configurator

The Device Finder tool helps searching specific NRA or IDA devices within a local area network. The tool requires an IP address and after finding the corresponding device in the network, it returns Host Name, MAC Address, Part and Serial Number as well as Firmware Version. Depending on the network setup the Device Finder is also able to detect any device in a network without entering any IP address. Using the Configurator tool via USB allows users also to change the network settings of their NRA or IDA.
3 Spectrum & Spectrum Multi View

The Spectrum Tool provides remotely controlled spectrum analysis with the NRA or the IDA. Users can easily set parameters such as Start and Stop Frequency, RBW, VBW, Reference Level and Traces by the buttons in the top. The set parameters are momentarily displayed in the bottom of the window.

Furthermore the Spectrum display can go on Hold by pressing the tab ‘Chart Off’. A momentary spectrum can be saved numerically by selecting the ‘CSV-Export’ tab. Depending on the IDA 2 antenna handle being connected or not, even the preamplifier can be switched on with the tab ‘Preamp’.

The Spectrum Multi View Tool is very similar to the Spectrum Tool. It consists of a main spectrum display and various individual sub-spectrum displays which are all based on the main spectrum. The main spectrum is displayed in the lower part of the window while the sub-spectra are displayed above. The sub-spectra are based on the same measuring parameters as the main spectrum. The only difference is that they allow displaying a smaller span with distinct start and stop frequencies.

Users need to understand that the Spectrum remote tool is a rather simple tool. It has no Marker functions and is not able to create a Spectrogram since it does not have any storage of the received spectrum data.

Both, spectrum and spectrum multi view tool allow connection via TCP/IP or serially via USB. Also users can decide on Binary or ASCII data transfer which may influence the effective update rate and the required network bandwidth.

Fig. 4: Narda Spectrum (top) and Spectrum Multi View (bottom)
4 Multi Channel Power *(corresponding instrument option required)*

The Multi Channel Power tool provides the measurement of distinct channels defined by the user. With help of the software NRA Tools / IDA Tools users can either create multi channel tables on a PC for later transfer to the device or directly create and save them on the device. Either way, the newly created multi channel needs to be activated via the Service Table tab in the Multi Channel Power tool.

![Multi Channel Power Chart and Table View](image)

*Fig. 5: Narda Multi Channel Power Chart (left) and Multi Channel Table View (right) Remote Tool*

The displayed values in the Multi Channel Power mode are integrated values within each channel meaning several signals within one channel are correctly considered (i.e. summed up) for the measurement. Next to displaying the measured results as a chart they can also be displayed numerically in a table.

5 Level Meter *(corresponding instrument option required)*

The Level Meter Tool is a simplified measuring mode compared to the Multi Channel Power Tool. Users need to specify one center frequency and a channel bandwidth. Based on these settings the tool returns the total channel power values based on various detectors.

![Level Meter Remote Tool](image)

*Fig. 6: Narda Level Meter Remote Tool*
6 Scope (corresponding instrument option required)

The remote Scope Mode Tool provides five operation modes: Long Time Scope, High Resolution Scope, IQ Stream and I or Q Stream separately. In order to apply the Scope Tool usefully, users should consider the correct signal frequency (e.g. with help of the Spectrum Tool or the Remote GUI) and the adequate CBW.

Fig. 7: Narda Long Term Scope View (left) and High Resolution Scope View (right)

7 Remote GUI

Another very useful tool, especially for training and demonstration, is the Remote Graphical User Interface (GUI). In contrast to the other tools presented up to now it does not receive numerical values which are then displayed in a chart. It is based on a simple image transfer from the IDA/NRA to any computer. Consequently, referring to the IDA it just shows what can be seen on the IDA display. Within the Remote GUI users can choose between BIN and ASCII image transfer data format. Typically ASCII format requires a much lower data rate, see also chapter 12.

The Remote GUI is an excellent tool for presentations. In cooperation with the IDA the Remote GUI is synchronized with the device in both directions. That means that inputs are possible via the GUI, which are then displayed on the device, or directly via the device which are then displayed on the GUI. This feature does not exist with the other demo tools such as the Spectrum or Scope Demo Tool!

Fig. 8: Remote Graphical User Interface (GUI)
8 IQ Streaming / IQ Stream Grabber *(corresponding instrument option required)*

The NRA and the IDA can stream IQ data continuously up to a maximum bandwidth of 400 kHz. For R&D purposes or in order to work on non-critical applications Narda provides a free set of simple, executable command files which can be used for IQ streaming.

As indicated by Figure 9 the executable `.cmd` files provided by Narda can work with both protocols, TCP and UDP. Furthermore the file set includes a small help file explaining the basic measuring settings. In order to start the IQ stream, users simply doubleclick on one of the executable files. Afterwards a wav file with IQ data will be created and grows in size corresponding to time. To change the center frequency, the bandwidth or to access a different device in the network, the executable cmd-files need to be opened and edited with any text editor. Moreover, it is also possible to retrieve IQ data with the amount of 250,000 pairs (I & Q) in a discontinuous, block format up to a bandwidth of 32 MHz. Refer to Technical Note 1103 for more information.

![Fig. 9: IQ Stream Grabber files](image)

9 Audio Streaming / Audio Stream Grabber *(corresponding option on IDA required)*

The Narda Audio Stream Grabber makes use of the NRA`s and IDA`s internal demodulation functions. The advantage of this function is that the required ethernet bandwidth can be significantly reduced in contrast to Audio content created by IQ data processing. Just as the IQ Stream Grabber explained in chapter 8, the Audio Stream Grabber comes as a set of directly executable `.cmd` file for TCP and UDP protocol.

Similarly to the IQ Stream Grabber mentioned in chapter 8 in order to adjust the center frequency, the bandwidth, the type of demodulation, or in order to enter the IP address for a different device, users simply edit the `.cmd` file with any text editor. Refer to Technical Note TN 1103 for further technical information.

![Fig. 10: Audio Stream Grabber files](image)
10 IDA Map Tools *(corresponding option on IDA required)*

With help of the IDA Map Tools Software users are able to download maps that can be transferred onto the IDA for Direction Finding and Mapping. The Map Tools Software will automatically connect to a server at Narda which synchronizes with Open Street Maps. In order to download a map it is necessary to start a project that should be named after the map of interest. After this users can move through the entire world and mark a specific area for download.

*Fig. 11: Narda Map Tools*

It is recommended to not download oversized areas as their corresponding downloads may take a very long time. Typically one should download only these areas in which one is going to work with the IDA. On the left-hand side bar of the software users can see how many tiles will be downloaded and what their size in terms of Megabytes will approximately be. Usually a project size of 300 MB or 400 MB with Zoom Level Settings from 7 to 17 is already quite large and can take several hours for download but may be acceptable for example when bigger cities including surrounding areas with many details are required.

With help of the software, Global Mapper users can also convert their own maps so that the IDA, too, can read them. Global Mapper can analyze the original map format and convert it into the Open Street Map format (also called Slippy Map format) which is required for the IDA.

*Fig. 12: 3rd Party Software Global Mapper*

Refer to Technical Note 105 'User generated maps’ on the Narda STS website for further information on this very useful tool!
11 Sophisticated 3rd Party Software Modules & Hints for Software Integration

For professional applications, Narda has partnered with various, specialized software suppliers. The table below shows that 3rd Party Software and gives a brief idea of its main purpose.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Software Name</th>
<th>Main Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMINT consulting</td>
<td>Krypto 500, Krypto 1000</td>
<td>Signal Demodulation and Decoding Software (SIGINT)</td>
</tr>
<tr>
<td>HILTRON</td>
<td>DSNG HMCS</td>
<td>SATCOM Auto-Pointing, Line-Up, HD Encoder</td>
</tr>
<tr>
<td>INRADIOS</td>
<td>CSM</td>
<td>Spectrum Analysis &amp; Communication System Monitoring</td>
</tr>
<tr>
<td>Procitec</td>
<td>Go2Signals Go2Monitor</td>
<td>Signal Demodulation and Decoding Software (SIGINT)</td>
</tr>
<tr>
<td>RadiolInspector</td>
<td>RadiolInspector®</td>
<td>Software for Radio Spectrum Monitoring (SIGINT, TSCM)</td>
</tr>
<tr>
<td>SAT Corporation</td>
<td>Monics®</td>
<td>Satellite Carrier Monitoring System</td>
</tr>
<tr>
<td>SatService</td>
<td>sat-nms MNC</td>
<td>SATCOM Monitoring and Control</td>
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<td>Remote Spec-An Monitor</td>
<td>SATCOM Transponder Measurement</td>
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<td>Skyline</td>
<td>dataminer</td>
<td>Spectrum Analysis and Radio Monitoring</td>
</tr>
<tr>
<td>TES AMERICA</td>
<td>TESMonitor®</td>
<td>Spectrum and Occupancy Monitoring</td>
</tr>
<tr>
<td>WILLTRON</td>
<td>DTS-3000 &amp; BTS-3000</td>
<td>Test System for Coverage Measurements (Out- &amp; Indoor)</td>
</tr>
</tbody>
</table>

Table 1: Currently available 3rd Party Software Modules with drivers to NRA & IDA

More drivers for 3rd party software products are continuously in preparation or available on request. For such projects system integrators and software manufacturers should be aware that with help of the Narda command reference guide they will be provided with all documentation and information for an efficient and successful integration work (see also following chapter 12).

Moreover the Narda Remote Utility Software also supports integration work by providing a Log-File function storing all transmitted commands and responses when operating an NRA or an IDA. By this function software developers can easily gather experience when getting familiar with Narda’s test instruments.

Fig. 13: Communication Log-File when using Remote Utilities
12 More Documents

Narda STS provides more documents helping users put customized solutions into practice. The subsequent list provides a brief overview on documents which are supplied on a CD with the purchased NRA / IDA set and which are also available on request:

- The ‘Command Reference Guides’ contain the basic operating commands for the IDA and NRA series. These commands are used in the background of any compatible 3rd party software. They can also be used manually with help of any terminal software. This can be useful for service reasons or when users need to establish individual remote functions on their IDA or NRA.

- The ‘Narda Utility Programs Description’ gives an overview and some operating hints on the Narda Software Modules which have been described in the chapters 2 through 7. It also mentions system requirements, explains how to connect a device via LAN and shows how transmitted commands and device responses can be saved in a Log-File.

- In addition to chapters 8 and 9, Narda STS provides further documentation on the software modules ‘Audio Stream Grabber’ and ‘IQ Stream Grabber’ on request.

- This application note comes with another note called ‘Date Rates and Response Times when using IDA and NRA in LAN/WAN Applications’ (Technical Note 1103). It deals in detail with the NRA and IDA series’ bandwidths, data rates and response times when operating them remotely.

- In order to learn more about how to convert maps into the Slippy map format required by the IDA (also ‘Open Street Map’) users should refer to ‘Application Note 103 – User generated maps’.