A20Lab
Control software for the
A20 FM Monitoring Decoder

Instruction Manual

September 2007

Content

1. Introduction

A20Lab is a PC software for MS Windows 98/98SE/ME/2000/XP/Vista and enables the user to operate the A20 / A20T by remote control. Remote connection is possible via TCP/IP or RS-232C interface. Almost every function of the A20 FM Monitoring Decoder can be displayed and controlled.

Important

Please read the entire manual before you start to use the software. Keep this manual for future use. It contains important operating instructions.

This manual explains the operation of the Software "A20Lab" and does not replace the manual of the "A20 FM Monitoring Decoder". For details of A20 functions please consult the "A20 FM Monitoring Decoder" manual.

Explicit definitions

This software is developed for the use with the MS Windows operating system. Its usage is similar to MS Windows. Please see your MS Windows manual for details of windows operations. For necessary mouse operations please place the mouse pointer on the specified display area and execute one of the following corresponding actions.

Double-click	Quickly push left mouse button twice
Mouse-click	Single push on left mouse button
Right-click	Single push on right mouse button

Additional notes:

The instrument model on the title page may differ from the supplied A20 model.
The figures in the manual may differ from the actual screen display.

Configurations, functions and specifications may change for further development without notice.

2. Manufacturer

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3. Installation

This section explains you how to install the software on the control PC.

Installation of the program files

The A20Lab program files are contained in the folder "A20Lab" of the delivered CD-ROM. Copy this folder into an appropriate folder of the control PC (e.g.: C:\Programs). Then you can generate a desktop shortcut to the file "A20Lab.exe" for a quick access.

4. General operation

Start the software

Simply double-click the file "A20Lab.exe" in the Windows Explorer or the established desktop shortcut. Then the software starts with the following window:
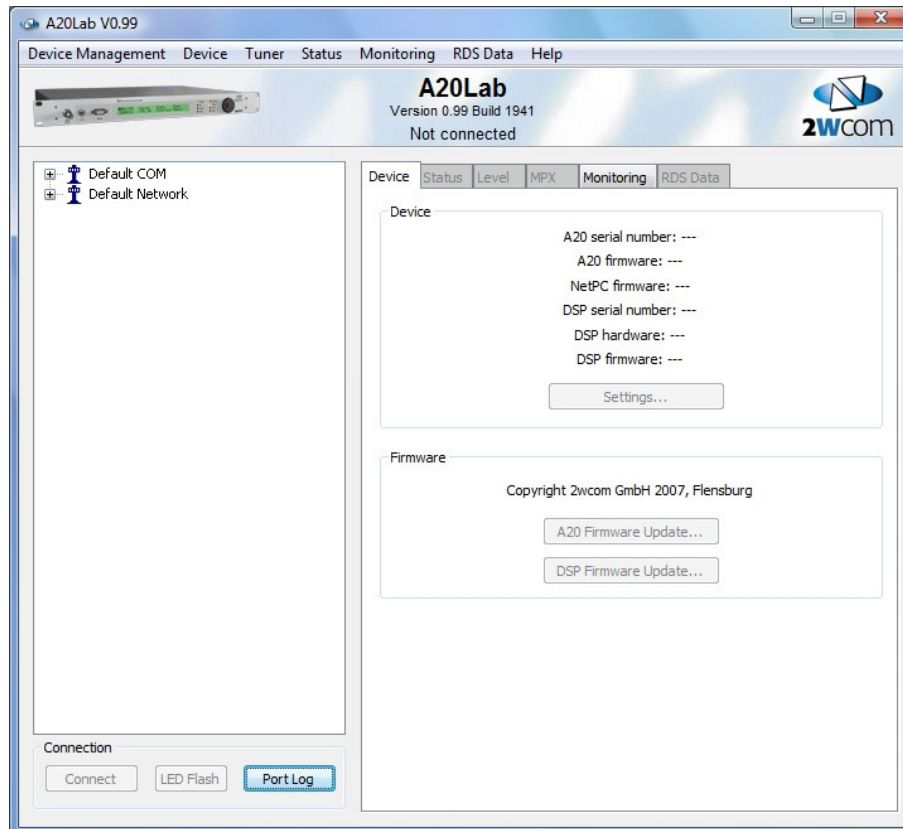
Structure of the program window

The program window has a structure of three different sections. The upper graphical section contains the program name, program mode, a detailed version information, as well as a status display that shows the present program status and activity.

In the top right-hand area of the window, just next to the 2wcom logo, an activity symbol is shown if a background operation is ongoing. Activity symbol: ()

The left-hand section of the window shows a tree view structure and the buttons for the connection control. The tree view structure shows the established structure of networks/locations (antenna tower symbol) with its A20 devices (A20 symbols). This enables a clear overview of small or large structures.

The right-hand section of the window can show various functional elements of the software, depending on the selected tab.

Menu information and menu language

A20Lab has a menu that enables instant access to the main program functions. Some functions are accessible even only via the menu.

The menu enables you to select the displayed program language (English / German) at any time (menu entry [Help → Language].

Set up the interface for data connection

After the installation, the tree view already shows some locations/networks with contained A20 instruments. The contained A20 devices are shown after a mouse-click on the [+] symbol in front of the corresponding location/network.

To set up the A20Lab interface to the A20 instrument, perform a right-click on the corresponding A20 symbol. Then select the entry [Properties…] of the appearing menu by a mouse-click to display the window "I/O Settings" (also accessible via the program window menu [Device Management → Properties]).
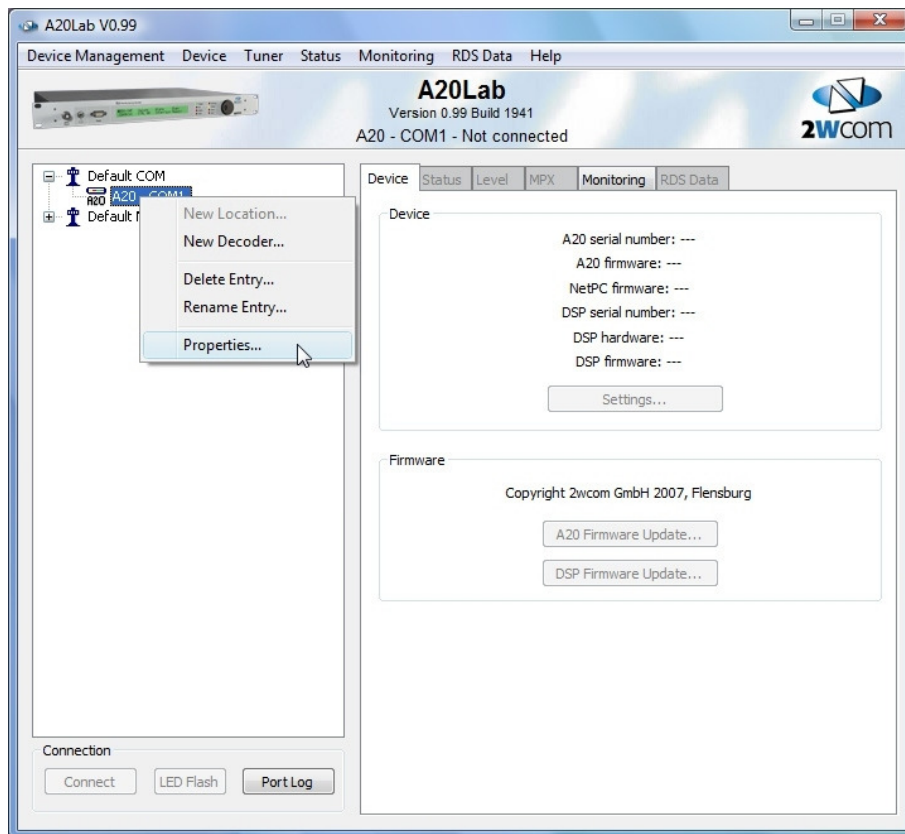
• Connection via TCP/IP

If it is intended to establish the connection to the A20 via TCP/IP, the following settings are necessary:

Use the drop-down menu at the top of the window "IO Settings" to select the entry "TCP/IP connection". Then it is necessary to enter the hostname as defined in the network **or** the IP-address as defined in the A20 instrument.
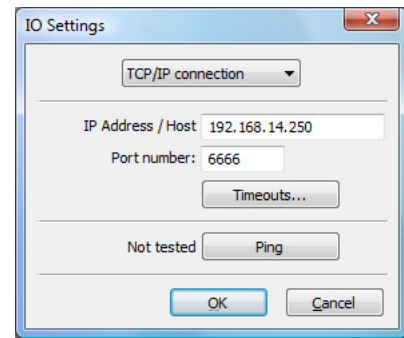
Additionally it is necessary to enter the port number as defined in the A20 instrument. The configuration port is used for the data connection to A20Lab.

The [Timeouts…] button can be used to set up other than the default timeouts for the network connection, if required. If the used TCP/IP connection is very slow and the connection is stopped by timeout, increase the TCP timeout values.
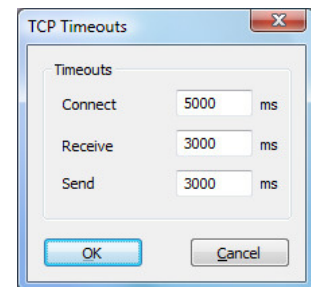
The [Ping] button can be used to find out if the entered IP address is reachable via the network. Additionally the latency of the routing is shown.

To finish the set up, perform a mouse-click on the [OK] button. For the remote control, connect the network connectors of the control-PC and the A20 instrument to the same network.


Note: Ethernet cables are available as patch cable or as cross-link cable. A cross-link cable is only used if the A20 instrument and the control PC are connected directly via a cable.

The structure and configuration of a network is individual and cannot be explained in this document. Please note: IP addresses have to be unique and should be assigned by a responsible network administrator if possible. In case of problems, please check the network, network cables, network ports and the network configuration of the PC and the A20 instrument. Consult the responsible network administrator where applicable.

• Connection via RS-232C interface

If it is intended to establish the connection to the A20 instrument via an RS-232C serial interface, the following settings are necessary:

Use the drop-down menu at the top of the window "IO Settings" to select the entry [RS-232C connection]. Then at "Port:" it is necessary to select the COM port, used on the control PC.
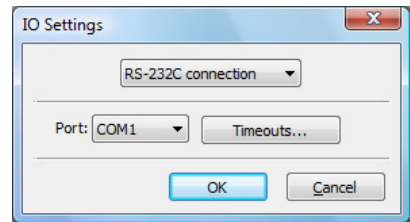
The [Timeouts…] button of the window "IO Settings" can be used to set up other than the default RS-232C interface timeouts.

To finish the set up, perform a mouse-click on the [OK] button.
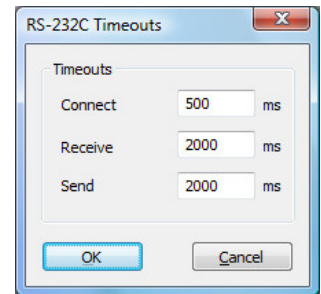
For remote control via RS-232C, connect an RS-232C cross-over/null modem cable between the configured COM port of the control PC and the [Front] or [DTE1] connector of the A20 instrument.

In case of problems, please check the cross-over/null modem cable, connectors and the interface configuration of the control PC and the A20 instrument. Consult the responsible system administrator where applicable.

How to change the tree view structure

The tree view shows a default structure of networks/locations with A20 instruments. This structure can be expanded for using additional A20 instruments on additional networks/location sites. Additionally it is possible to modify the existing structure.

To add a new location, move the mouse pointer to a network/location entry and perform a right-click with the mouse. Select the entry [New Location…] in the appearing context menu (or select [Device Management → New Location] in the menu). Enter a name in the appearing edit field. Do not use more than 8 to 12 characters or the symbols \ / : * ? " < > |. Confirm the settings by hitting the "Return" key or by a mouse-click outside the edit field. If you want to cancel the process, hit the "ESC" key.

Example
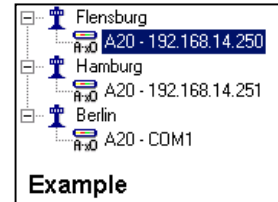
To add a new A20 instrument, select the location entry where the new instrument should appear and then perform a right-click. Choose the entry [New Decoder…] in the appearing context menu (or select [Device Management -> New Decoder]). Enter a name in the appearing edit field. Do not use more than 8-12 characters or the symbols \ / : * ? " < > |. Confirm the name with a mouse-click on the [OK] button. Then the new instrument is shown in the tree view.

To delete an existing entry or to change the name of an entry, just follow the previously described steps. Use the context menu or the program window menu entry [Device management] and select [Delete Entry…] or [Rename Entry…]. Location entries have to be empty to be deletable.

At the start of the program, the software automatically selects the tree view structure entry of the A20 instrument that was connected before.

Out of range input indication (orange colored input fields)

If a numerical input field of a remote tab contains an out of range value, the input field turns orange. Then, a ToolTip shows the valid value range. If the value is corrected and then within range, the input field turns back to normal background color.
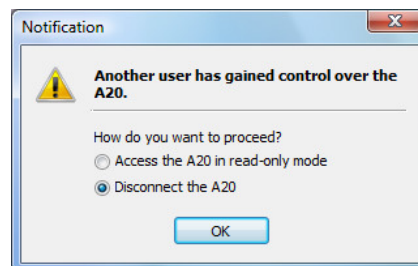
Connection control

If the instrument and the interface to the control PC is configured correctly, the remote control functions can be used. The buttons of the connection control have the following functions:

[Connect] - The desired instrument has to be selected with a mouse-click in the tree view for connection. A mouse-click on a [+] symbol opens the tree with the instruments of a specific location. A mouse-click on the button [Connect] establishes a data connection to the selected instrument.

A20Lab allows only a single user to take control over the connected A20. If for example another user is connected to the A20 via RS-232C, and you try to establish a connection via TCP/IP to the same A20, the following window appears.

You can choose if you do not want to access the A20 in this case or if you accept a read-only access. Then A20Lab does not allow changes on the A20, but it is possible to read-out all values. If the first connected user e.g. changes the tuner frequency, the second connected (read-only) user can see these changes. Another possibility is to take control over the A20 yourself, instead of the first user. The first user then looses control of the A20 and sees the following message window:

So the previous first user is informed that another user has taken control over the A20 as first user. The previous first user then has the possibility to disconnect or to access the A20 in read-only mode.

[Disconnect] - A mouse-click on this button disconnects an established data connection.

[LED Flash] - This button enables the user to identify the connected instrument out of several instruments (e.g. in a rack) by activating all LED´s for a short flash.

[Port Log] – The data communication between A20Lab and the connected instrument is continuously logged in the background. The button [Port Log] starts a "Port Log" window, which shows the logged data.

A right-click in the list box of the "Port Log" window opens a context menu that enables to copy the log content or to save it as a file. Only the selected rows are saved (or all rows if no selection is active).

White colored rows indicate data sent by A20Lab to the A20 instrument. Blue colored rows indicate response data / data of the A20 instrument.
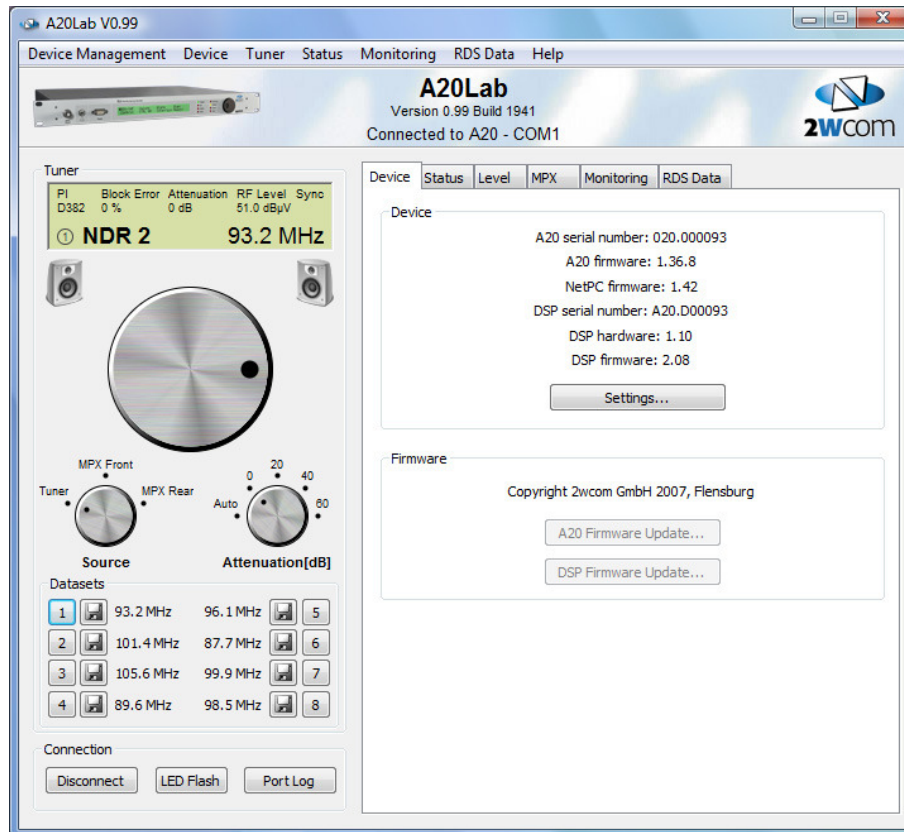
The check box [Pause] can be used to pause the logging. The check box [Scroll automatically] can be used to ensure that the latest data is shown in the list box.
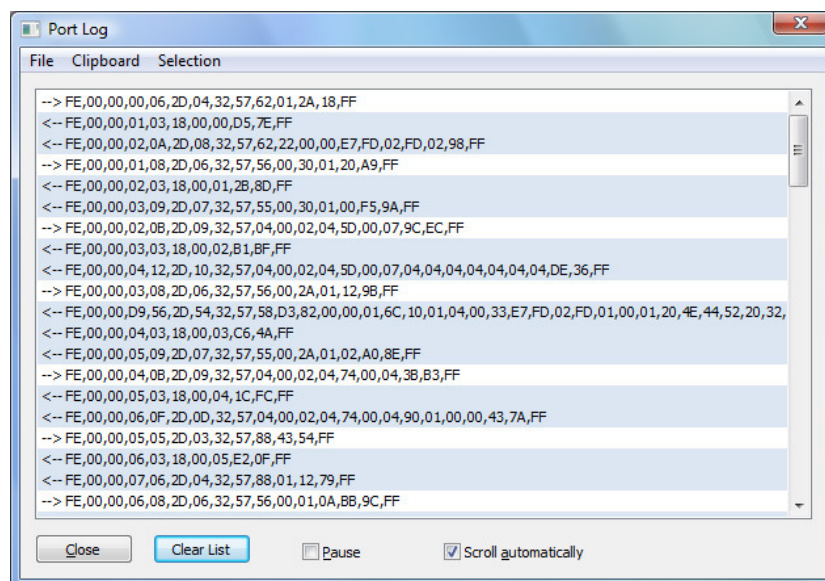
5. Functions

Tuner control

If A20Lab has established a data connection to an A20 instrument, the left-hand part of the program window shows a tuner control instead of the tree view structure.

The simulated LCD screen shows several important information:
PI, block error rate, chosen RF attenuation (for activated auto-attenuation, the automatically selected attenuation), RF level, sync. status (in case of no sync., the word "Sync" is displayed in grey instead of black), the number of the active monitoring dataset (bottom left, encircled number), PS, tuner frequency or MPX Front/Rear.

The big Jogwheel can be used to tune the frequency. The two rotary-switches can be used to select the signal source (internal tuner, MPX front, MPX rear), as well as the RF attenuation.

Below the two rotary switches are eight "station buttons". The buttons can be used to activate one of the eight monitoring datasets. Changes (e.g. a changed frequency or RF attenuation) can be saved by a mouse-click on the disk-symbol [🖫] of the corresponding dataset.

If the A20 instrument is operated locally (e.g. the frequency is changed), these changes are automatically shown on the simulated LCD screen and also by the rotary switches for signal source and RF attenuation of A20Lab. So these A20Lab elements always show the present status of the instrument.

Audio monitoring

The two loudspeaker symbols below the LCD-screen (only visible for instruments with MP3 option) can be used to start an audio monitoring of the currently received station / signal input.

The audio monitoring establishes a connection to the MP3 port (TCP/IP) of the A20, to play the MP3 data stream via an audio device (sound card / sound on-board). So it is not necessary to install and use an external MP3 player software.
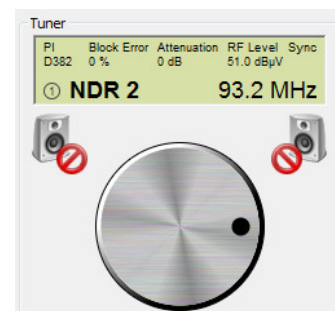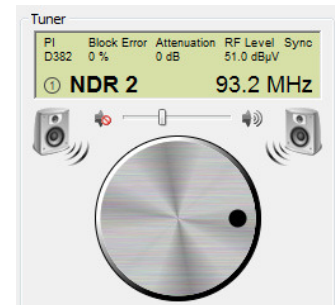
If the connection is established, the loudspeaker symbols are switched to "active" (see figure on the right side) to indicate the active audio monitoring.

After the data buffering and the start of the audio playback, an audio volume slide control is displayed above the Jogwheel. The symbol that is left of the slide control can be used as an audio mute button.

The audio monitoring requires that an MP3 audio codec is installed as part of the Windows operating system. Windows XP and Vista have this codec installed by default. Other Windows systems have this codec installed if Windows Media Player ≥ Version 9 is installed.

If A20Lab cannot detect an MP3 codec or an audio device on the PC, the audio monitoring is not possible. The loudspeaker symbols are then marked accordingly (see figure on the right side).

If the mouse pointer is placed at such a marked loudspeaker symbol, a help text shows the details of the problem.

Tab [Device]

The tab [Device] shows the serial number of the connected A20 instrument, as well as all hardware and software versions.

If no data connection is established, the two buttons [A20 Firmware Update] and [DSP Firmware Update] can be used to update the A20- or DSP-firmware of the A20 instrument that is currently selected in the tree view structure. Details about this procedure can be found on page 37 and page 39.

All basic settings of the A20 are covered in the separate dialog "Device Settings", accessible via the button [Settings].

Device Settings

The window "Device settings", accessible via the button [Settings] on the tab [Device], covers the following A20 settings:
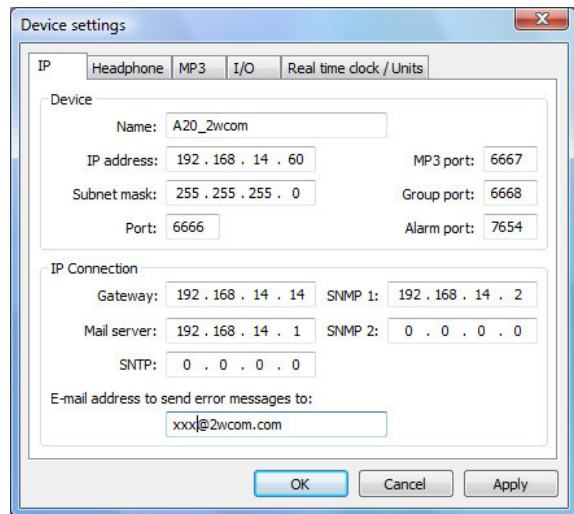
[IP], [Headphone], [MP3], [I/O] and [Real time clock / Units].

Changes need to be sent by a mouse-click on [OK] or [Apply].

The individual settings of the dialog "Device Settings" are explained on the next pages.
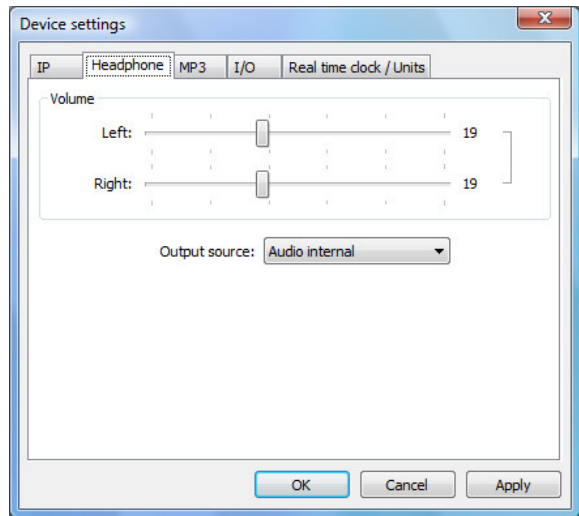
Tab [IP]

The tab [IP] of the window [Device Settings] is for setting the TCP/IP interface of the connected A20, as well as setting its E-Mail-, SNMP-, and SNMP-configuration.

Name	Show/Select the instrument network name (hostname). Note that this name is part of the originator e-mail address (hostname@mailserver.xx) for sending e-mail messages from the instrument and that this name must not contain spaces or any special characters. The hostname is intended as identifier and has to be unique in the network.
IP address	Unique instrument address, which identifies the instrument in a network.
Subnet mask	Bit mask that separates an IP-address into a network part and a host part.
Port	Show/Select the port number that is used for the connection to A20Config.
MP3 port	Port number that is used for the MP3 streaming (requires option MP3).
Group port	Port number that is used for sending data to the RDS soft decoder.
Alarm port	Port number that can be used for transferring alarms.
Gateway	Address of the system, which connects the local network to the internet.
Mail server	Address of the SMTP e-mail server to be used.
SNTP	Show/Enter which NTP time server IP can be used for synchronizing the internal real time clock / date.
SNMP 1	Show/Enter to which IP address the monitoring function of the instrument sends the SNMP-traps (messages).
SNMP 2	Show/Enter to which IP address the monitoring function of the instrument sends the SNMP-traps (messages) additionally.
E-mail address to send error messages to:	Show/Enter to which e-mail address the monitoring e-mail-messages of the instrument should be sent.

Tab [Headphone]

The tab [Headphone] of the window [Device Settings] is for setting the volume of the headphone output and the audio source for the headphone audio output of the A20.
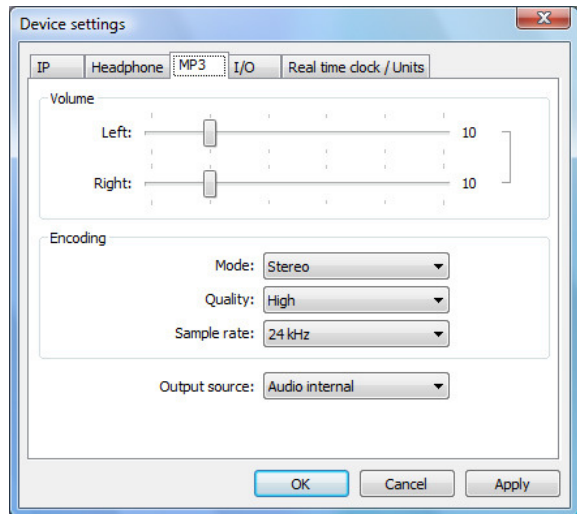
Volume Left:	Show/Select the left channel headphone volume level.
Volume Right:	Show/Select the right channel headphone volume level.
Bracket at the sliding controls	Show/Select if the volume level of the channels (left/right) should be set individually (interrupted line) or combined.
Output source	Show/Select which signal should be available at the headphone connector of the A20. [None] = no signal [Audio internal] = signal of the internal stereo decoder [Audio external] = Signal of the external audio inputs [Audio MPX] = non decoded internal receiver MPX signal

The tab [MP3] of the window [Device Settings] is for the configuration of the MP3 encoder, to enable the transmission of an MP3 audio live stream via TCP/IP (see also "Audio Monitoring" on page 13).

Note: Only applicable for A20 instruments with integrated MP3 module.
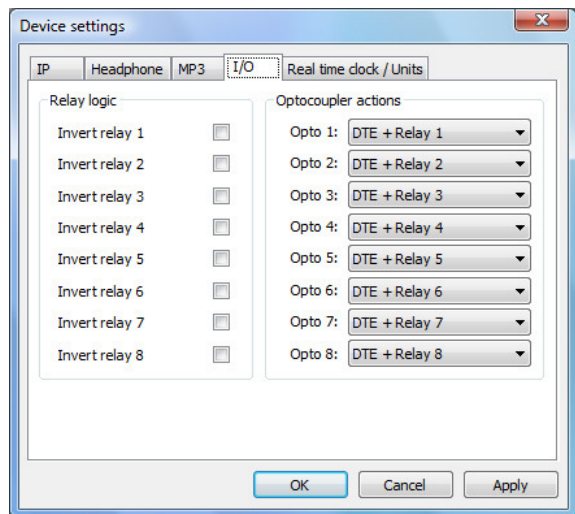
Volume Left / Volume Right	Show/Adjust the maximum volume level of the generated MP3 signal. This setting is for an initial adjustment only and determines the maximum audio level available at the MP3 player software; the actual MP3 playing volume is adjusted at the MP3 player software only. The levels generally need to be adjusted carefully to avoid signal overload clipping.
Bracket at the sliding controls	Show/Select if the volume level of the channels (left/right) should be set individually (interrupted line) or combined.
Mode	Show/Select if a stereo or mono MP3 signal should be generated.
Quality	Show/Select which MP3 coding quality level should be used. The coding quality level affects the effective bit rate of the data stream. Available are [Low], [Mid] and [High].
Sample rate	Show/Select which sample rate should be used. Available are [16], [22.05], and [24] kHz.
Audio source	Show/Select which signal should be sent via the MP3 live stream. [None] = no signal [Audio internal] = signal of the internal stereo decoder [Audio external] = Signal of the external audio inputs [Audio MPX] = non decoded internal receiver MPX signal

Manual start of the MP3 streaming via an external player: In the MP3 player application, select the function to play an URL and enter the URL in the format: "http://xxx.xxx.xxx.xxx:mp3-port".
The "x" represents the IP address of the specific A20 instrument and is followed by a colon and the configured MP3 port number.

The MS Windows Media Player software does not support the generated MP3 stream format ICY Shoutcast (tested with V10.00.00.3802 and V11.0.6000.6324). Programs that support the format are e.g. Winamp and iTunes.
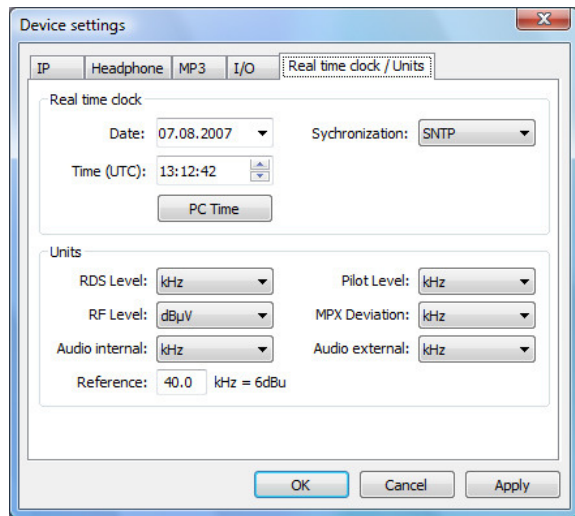
The tab [I/O] of the window [Device Settings] is for setting the configuration of the relay logic (inverted or normal) and the opto input actions.

Relay logic	The "Invert" check boxes can be used to invert the relay functions (inverting is active if checkbox is activated).
Opto input actions	Show/Select the assigned function of the specific opto input. If an opto input is actuated, the assigned function is executed. Possible functions are: • E-Mail: Sends an e-mail message to defined address • DTE: Outputs an ASCII text message via port DTE1 • Relay x: Activates relay x (x = No. 1...8) • SNMP: Sends an SNMP trap message to defined SNMP address. • DSx: Activates a monitoring dataset (x = No. 1...8) • All dual combinations of the above functions (except DSx) Notes: No opto functions are executed if the scan mode is activated. The activation of an opto input resets the functions that are activated by other active opto input. Active messages are not ended by switching to another dataset. Opto input 1...8 represent opto input 0...7 of the unit.

Tab [Real time clock / Units]

The tab [Real time clock / Units] of the window [Device Settings] is for setting the A20 integrated real time clock and for setting the configuration of the measurement units to be displayed.

Date	Input field for the display/input of the date of the internal real time clock.
Time (UTC)	Input field for the display/input of the time of the internal real time clock.
PC Time	Copies the date and the time of the PC clock to the input fields
Synchronization	Setting the method for synchronizing the integrated real time clock (RTC). [None]: No synchronization of the RTC. [CT]: The A20 RTC is set by the RDS CT if two consecutive, correct CT transmissions (minimum two minutes) have been received. [SNTP]: The A20 RTC is set by an NTP time server over TCP/IP connection (for SNTP server setting see tab [IP])
Units	Here it is possible to choose the measuring unit to be displayed for several measurement values. Additionally it is possible to set the transmitter FM deviation that is caused by a modulation voltage level of 6 dBu. With this setting it is possible to display correct modulation voltage levels. (Typical values are e.g. 40 kHz or 50 kHz.)

Tab [Status]

The tab [Status] is for showing several received RDS parameter and values. Additionally the status of the relay, opto inputs, and the internal buffer battery is shown. The display is continuously updated.

If an alarm method is assigned to a monitorable parameter/value, a status "LED" indicates for most of the values, if this parameter/value is currently within the defined tolerance range (green) or out of the defined tolerance range (red). This indication is independent of the defined delay times and is only shown if the measured values are valid.

Two individual columns show the actual/reference values. If a reference value is shown, the corresponding actual value is monitored. The "Alarm" column shows if a value triggered an alarm.

The "Log" column can be used to select the data for the logging. The logging itself is started by a mouse-click on the button [Start Recording…]. Use the appearing "Save status data" dialog to specify the log file name and target folder. The log file has the CSV format and contains all marked values. Use the button [Stop Recording…] to stop the logging.

Note: If the measurement units are changed (via tab [Device] -> [Settings…] -> tab [Real time clock / Units]) while the logging is activated, the log file is closed and a new log file for all new log data is created. The name of the new log file is the old log file name plus a counter suffix. This counter is increased for every change of the measurement units.
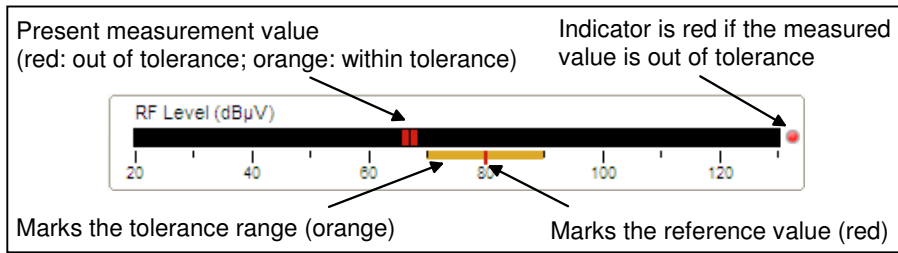
Tab [Level]

The tab [Level] is for the graphical display of the RDS-, RF-, and pilot level, as well as the audio level (internal/external, L/R) and the MPX level.
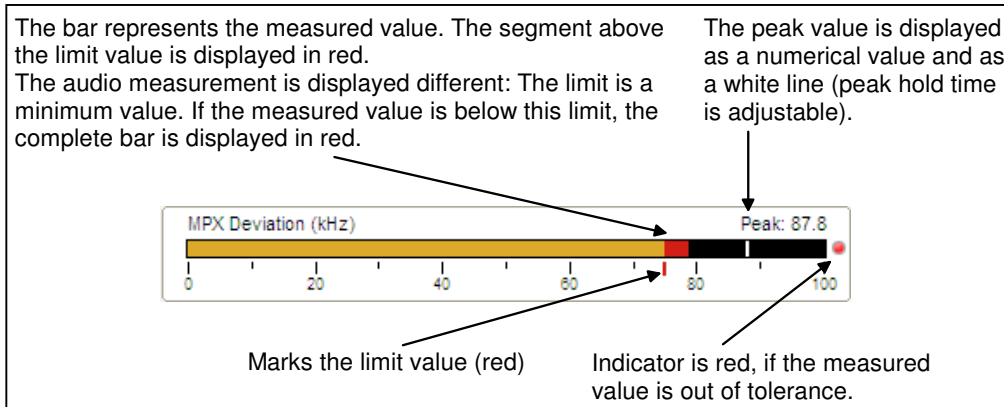
Note: Not all shown level displays may be shown with your A20 instrument, as this depends on the type/options of the connected A20.
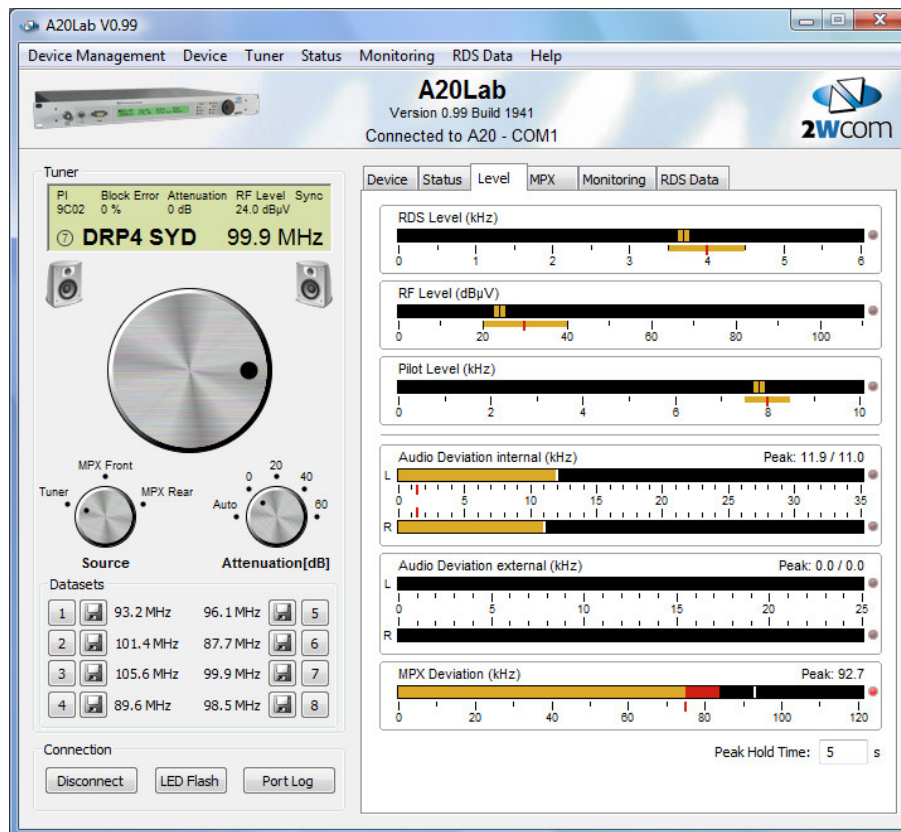
The graphical display of levels and FM deviation levels is slightly different. The details of the elements are shown in the following figures
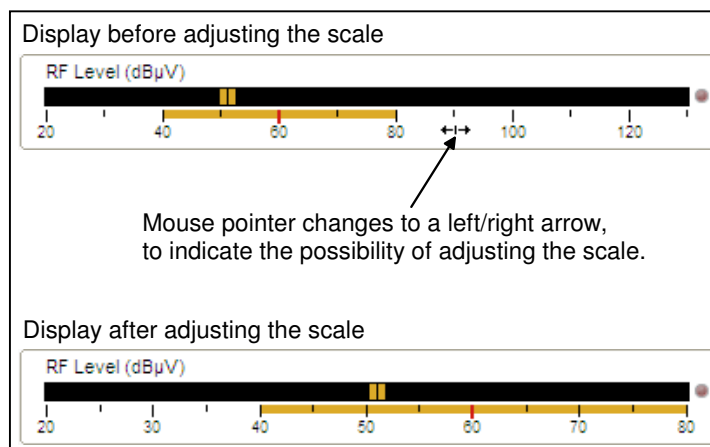
Present measurement value
(red: out of tolerance; orange: within tolerance)

Indicator is red if the measured
value is out of tolerance

RF Level (dBµV)

20   40   60   80   100   120

Marks the tolerance range (orange)

Marks the reference value (red)

Graphical display of levels

The bar represents the measured value. The segment above
the limit value is displayed in red.
The audio measurement is displayed different: The limit is a
minimum value. If the measured value is below this limit, the
complete bar is displayed in red.

The peak value is displayed
as a numerical value and as
a white line (peak hold time
is adjustable).

MPX Deviation (kHz)   Peak: 87.8

0   20   40   60   80   100

Marks the limit value (red)

Indicator is red, if the measured
value is out of tolerance.

Graphical display of FM deviation levels

The scales of the level displays are adjustable and can be adjusted according to your
needs. If the mouse pointer is positioned on a scale, it changes to a left/right arrow.
By pushing the left mouse button while moving the mouse, it is possible to adjust the
max. value of the scale. The maximum value is limited to a reasonable value,
depending on the selected level unit.

Display before adjusting the scale

RF Level (dBµV)

20   40   60   80   ←I→   100   120

Mouse pointer changes to a left/right arrow,
to indicate the possibility of adjusting the scale.

Display after adjusting the scale

RF Level (dBµV)

20   30   40   50   60   70   80

Additionally it is possible to shift the scale range (e.g. to have a scale range of 30 to 90, instead of 20 to 80). To do this, place the mouse pointer on the scale, push the shift-key and keep it pushed (mouse pointer changes to a hand symbol). Then push the left mouse button while moving the mouse to shift the scale. The maximum and minimum values are limited to reasonable values, depending on the selected level unit.
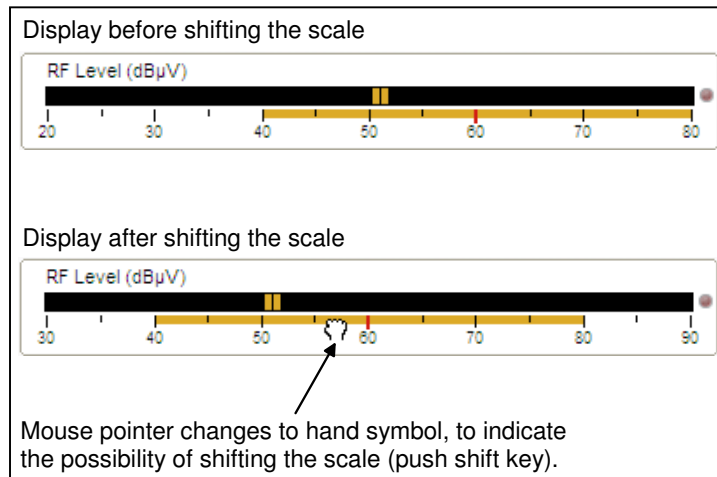
Display before/after shifting the scale

It is possible to reset the scales to its default values at any time. To do this, right-click on the corresponding scale and select [Reset to defaults] in the appearing context menu.
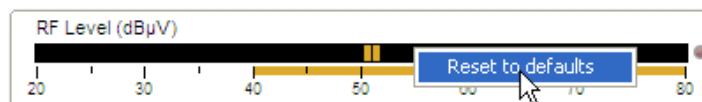
The tolerance range indicator or the limit/reference indicator of a bar display is only shown if a monitoring alarm method is selected for the value. If this is not the case, the level bar is always plain orange.

The input field [Peak Hold Time] can be used to change the peak hold display delay time. Possible values are between 1 and 999 seconds.
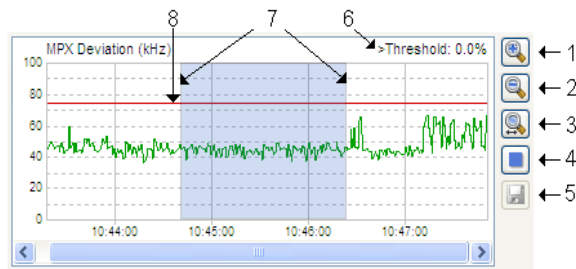
Tab [MPX]

The tab [MPX] is for recording the MPX power and the MPX level over a long time period. The recorded values are displayed as a graphical diagram.

Note: The access to the tab [MPX] is limited to connected A20 MPX devices.
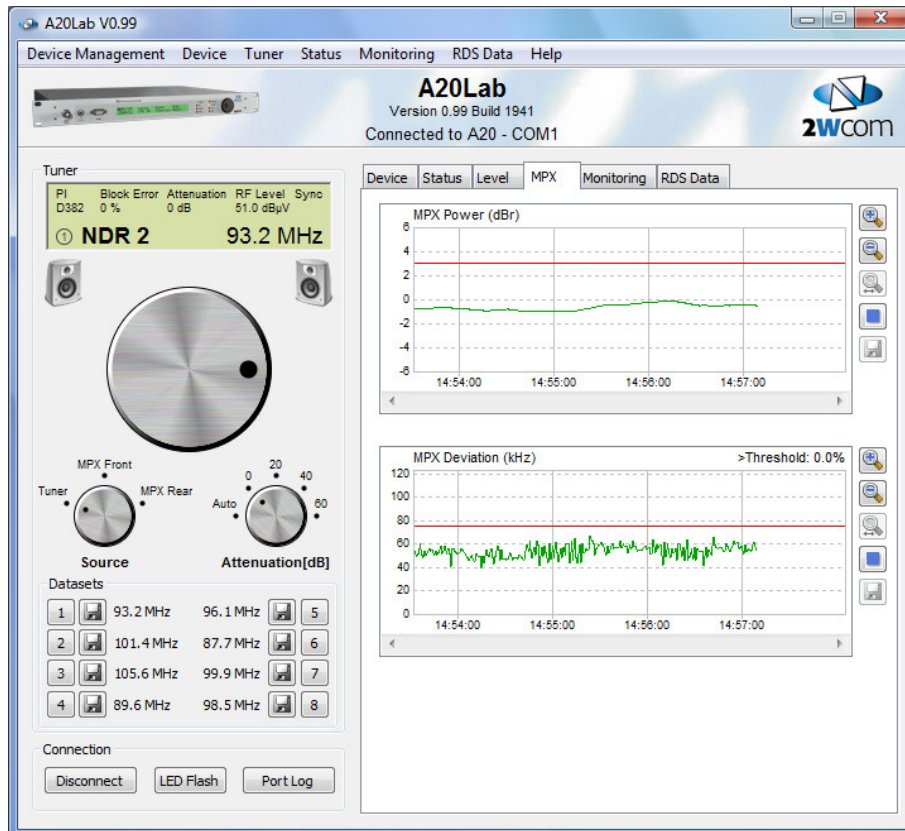
The details of the diagram control elements are shown on the following figures.

1: The magnifying glass with the plus symbol stretches the time domain (limited to a specific limit, which deactivates the button).

2: The magnifying glass with the minus symbol compresses the time domain (limited to a specific limit, which deactivates the button).

3: The magnifying glass with the arrow symbol zooms the display to an existing selection (see index 7 for selection details; without a selection, the button is deactivated).

4: Red circle / Blue square: This button is for starting the recording (red circle) and for stopping the recording (blue square).

5: Save an existing recording as CSV file. The button is only accessible if a recording exists, but no recording is active.

6: Displays the amount of values that exceed the limit. The value is expressed as a percentage.

7: Selection: Click into the diagram and keep the left mouse button pushed, while moving the mouse to make the desired selection. The selected area is shown as a blue shaded area.

8: Red line: The red line marks the limit value. Measurement values above this limit are drawn in red color, values below this limit are drawn in green color.

Like the scale of a level display on tab [Level], the vertical scale of the MPX level and MPX power diagram can be adjusted. This can be done in the same way as described before.

Mouse pointer changes to a hand symbol to indicate the possibility of shifting the scale (push shift key).
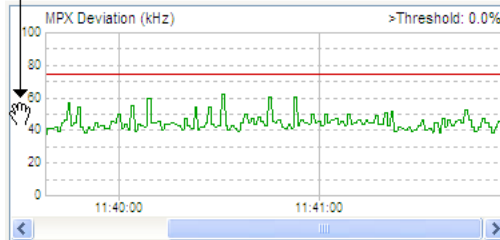

Default scale display

If the mouse pointer is positioned on a vertical scale, it changes to an up/down arrow. By pushing the left mouse button while moving the mouse, it is possible to adjust the max. value of the scale.

Additionally it is possible to shift the scale. To do this, place the mouse pointer on the scale, push the shift key and keep it pushed (mouse pointer changes to a hand symbol). Then push the left mouse button while moving the mouse to shift the scale.

The maximum and minimum values are limited to reasonable values, depending on the selected level unit. If you want a more detailed display and e.g. the lower scale value is at the limit, first adjust the max. value of the scale to a lower value and then shift the scale to the desired scale display.

Mouse pointer changes to up/down symbol to indicate the possibility of adjusting the scale range.
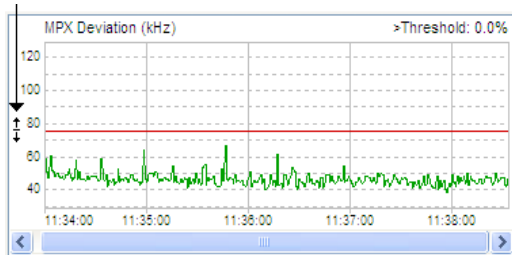
Display after shifting the scale range
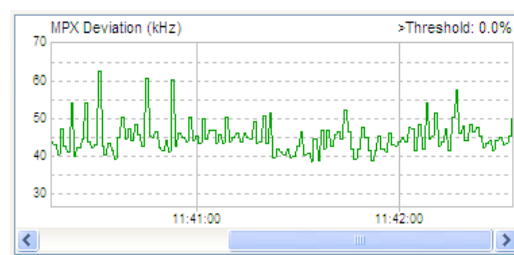
Display after changing the scale max. value

If the signal source is changed during an ongoing measurement recording, this is indicated by an additional row in the saved CSV file – like in the following example:

```
Date;Time (UTC);MPX Deviation (kHz)
30.05.2007;12:14:58.196;48,30
30.05.2007;12:14:58.278;48,30
New Source: MPX Front
30.05.2007;12:15:03.778;
30.05.2007;12:15:04.037;
New Source: Tuner, 93.2 MHz
30.05.2007;12:15:04.793;48,30
30.05.2007;12:15:05.043;48,30
```

Please note: If the measurement units are changed (via tab [Device] -> [Settings…] -> tab [Real time clock / Units] while the logging is activated, the log file is closed and a new log file for all new log data is created.

Tab [Monitoring]

The tab [Monitoring] is for editing the monitoring datasets. These datasets can be saved locally on the PC or can be read out from the connected A20.
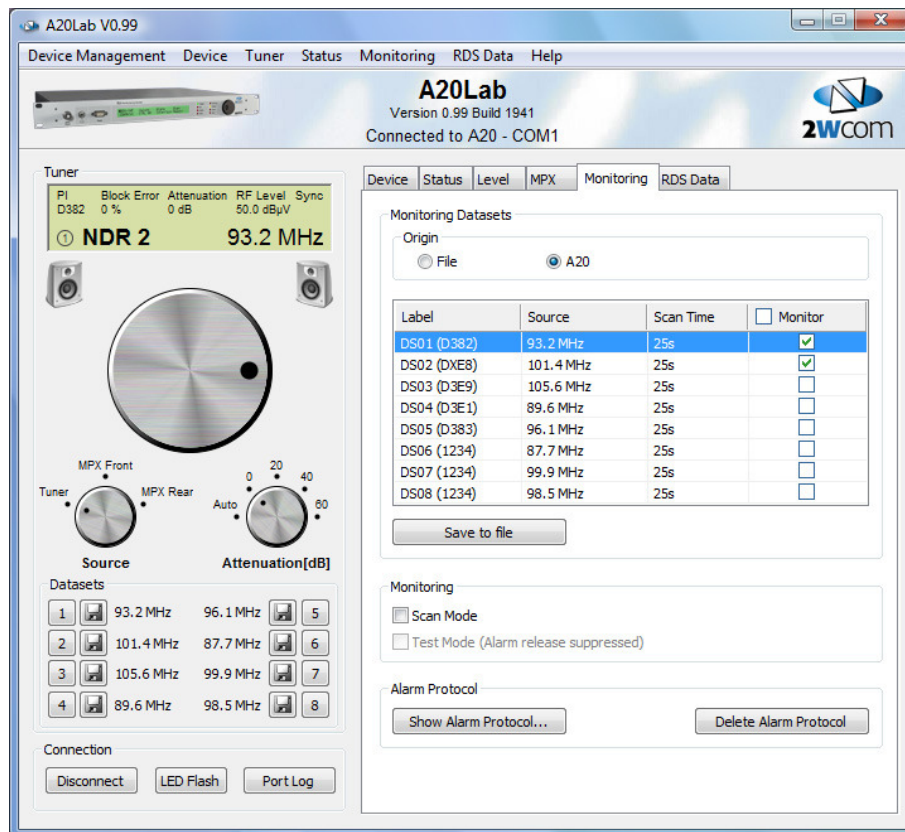
The "Monitoring Datasets" area shows a list with the eight datasets. The column "Monitor" contains check boxes to activate the monitoring of the individual datasets. A mouse-click on the check box in the column header activates/deactivates the monitoring of all datasets.

The two radio buttons above the dataset list can be used to select if the locally saved data ([File]) or the read-out data of the connected A20 ([A20]) should be displayed. If [File] is selected, the button [Send to A20] below the list can be used to send all datasets to the connected A20.

If a data connection to an A20 instrument is active and the tab [Monitoring] is chosen the first time, the radio button [A20] will be activated and the datasets of the connected A20 will be read-out and shown. While the read-out process starts and continues, it is possible to edit the datasets that are already read-out. After read-out all datasets, the button [Save to file] below the list can be used to save the read-out datasets locally on the PC.

A double-click on a dataset shows the "Edit Dataset" window with all monitoring settings of the dataset.

Changes on the dataset settings are saved instantly (no matter if [File] or [A20] is selected as data source).

The tab [Monitoring] can be used to configure the dataset settings also while not connected to an instrument. To do this, an instrument has to be selected by a mouse-click in the tree view. Then the settings of the tab can be changed. This can be done for every instrument profile individually. The dataset changes are saved locally on the PC and can be transmitted to an instrument while connected later on.
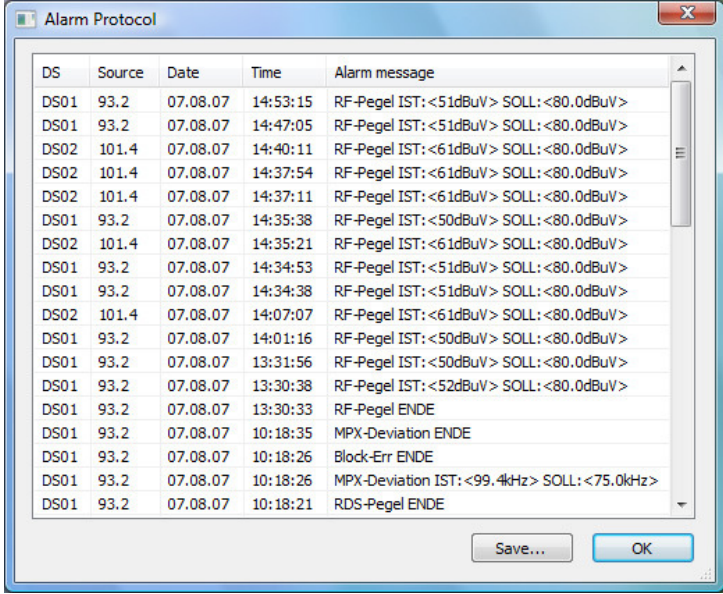
The check box [Scan Mode] can be used to start/stop the dataset scan mode. An activated scan mode is indicated by a gearwheel symbol in the tab header of tab [Monitoring].
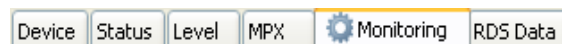
The button [Show Alarm Protocol…] can be used to display the stored alarm messages of the connected A20 (see next page for details about the "Alarm Protocol" window).

The button [Delete Alarm Protocol] deletes all alarm messages, stored in the connected A20.

Alarm Protocol

The window "Alarm Protocol" can be opened by a mouse-click on the button [Show Alarm Protocol…] on tab [Monitoring]. It is possible to cancel the read-out process by closing the "Alarm Protocol" window.

The button [Save…] can be used to save all alarm messages in a text file.

Window [Edit Dataset]

A double-click on a dataset entry of the tab [Monitoring] opens the window "Edit Dataset" with the corresponding monitoring settings. All parameter of the dataset can be edited.
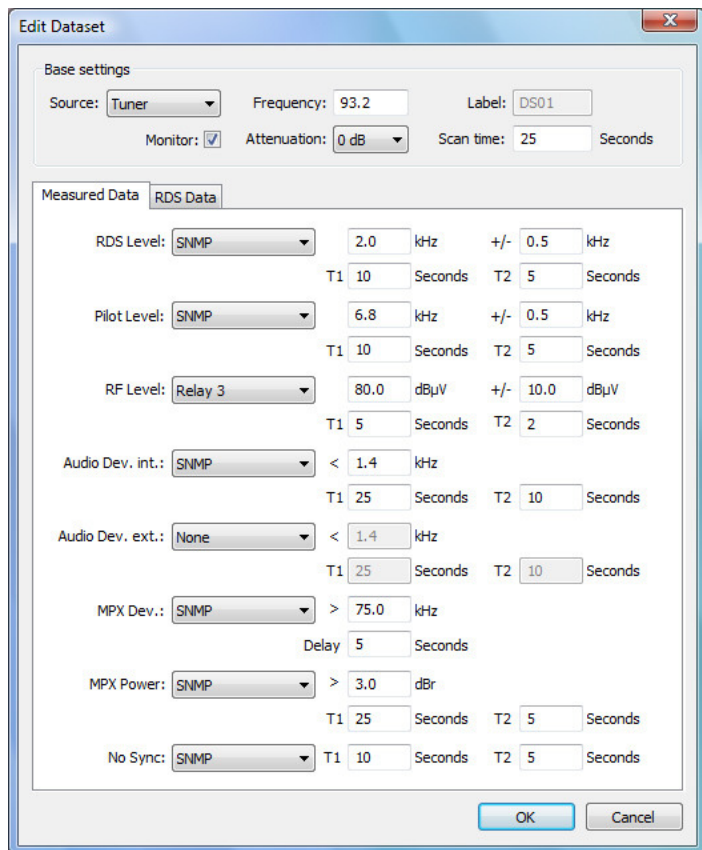
Source	Show/Select if the [Tuner] signal or a signal from the MPX inputs [MPX Front] or [MPX Rear] should be monitored.
Frequency	Show/Select the dataset specific receiving frequency for tuner operation.
Label	Display of the dataset identifier
Monitor	Show/Select if the configured monitoring and alerting settings of the dataset should be activated (checkbox activated) or not.
Attenuation	Show/Select if the RF signal at the [RF Input] should be attenuated to extend the measurement range.
Scan time	Show/Select the time that the instrument waits before switching to the next dataset during active scan mode.

The monitoring functions on the next pages can be assigned to various messaging methods.

Available are:

• [None] (Monitoring inactive)
• [E-Mail] (Sends alarm message via e-mail)
• [Relay] (Activation of a relay; 8 are available)
• [DTE] (ASCII text message via the DTE1 RS-232C interface).
• [SNMP] (Alerting by an SNMP-trap via TCP/IP).
• Additionally all methods can be dual combined.

Several functions allow to enter an alarm activation delay time (T1) and an alarm reset delay time (T2) in seconds additionally.

Only if an alarm messaging method is selected, the corresponding input fields are accessible (and possibly colored in orange, if the entered value is out of range).

As the possible tolerance value range depends on the reference value, the tolerance range is automatically changed if the reference value is changed.
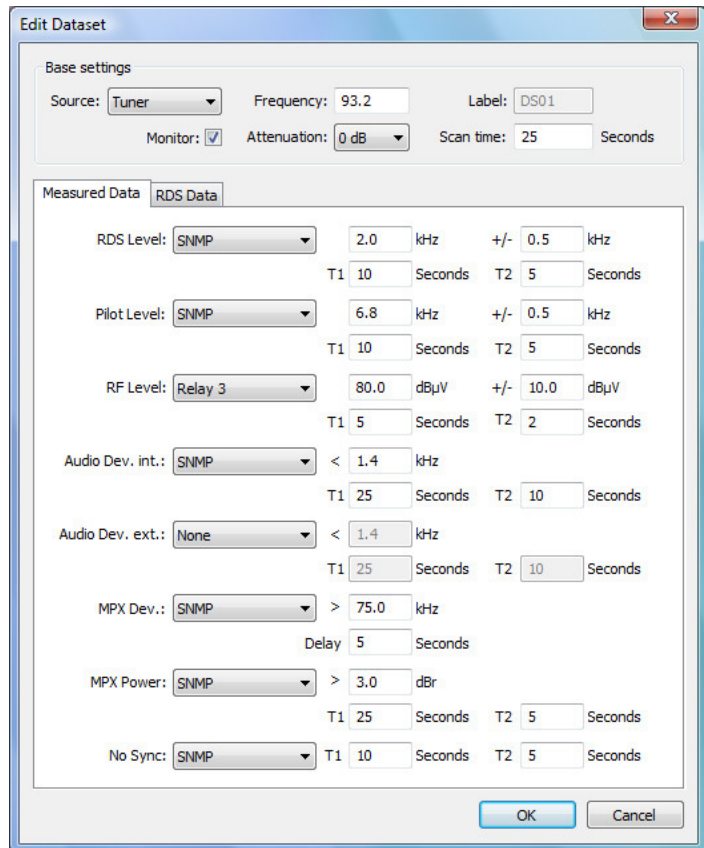
Example:

Valid value range	Reference value	Possible tolerance range
25…2500 mVpp (RDS)	200 mVpp	+/- 175 mVpp
25…2500 mVpp (RDS)	1000 mVpp	+/- 975 mVpp

To avoid that invalid values are transferred to a connected A20, it is only possible to save a dataset if all values are valid / in range (no orange colored input fields).
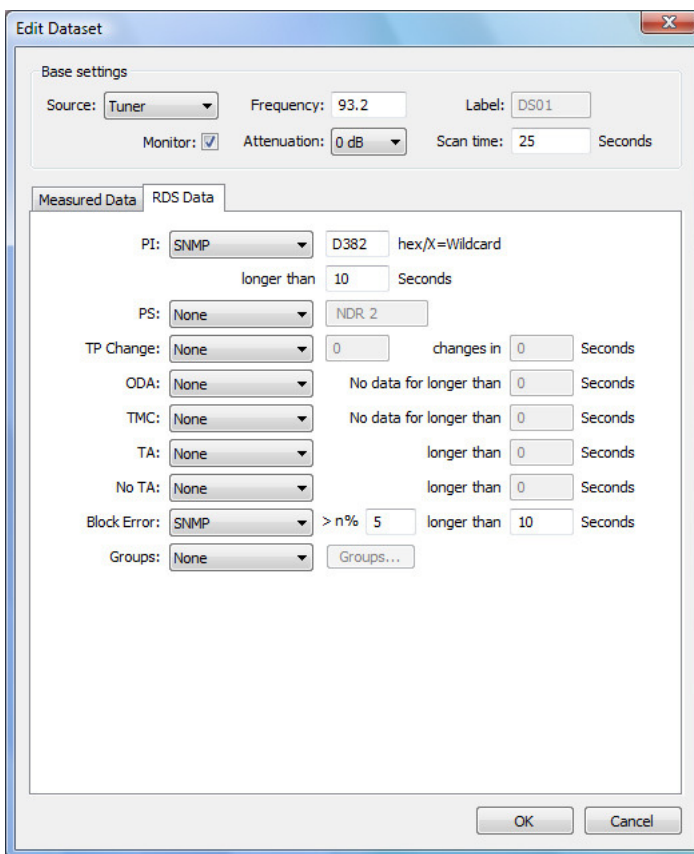
Tab [Measured Data] of the window "Edit dataset":

| RDS Level	Show/Select the RDS modulation level to be monitored. Additionally a tolerance range can be defined.
Pilot Level	Show/Select the pilot signal level to be monitored.
RF Level	Show/Select the RF level to be monitored.
Audio Dev. int.	Show/Select if the received audio should be observed for a minimum audio level / FM deviation within a specified time interval. If the tuner audio signal is monitored and the signal is below the minimum according to the monitoring, the LED "Audio" at the unit is activated.
Audio Dev. ext.	Show/Select if the audio signal from the external audio inputs should be observed for a minimum audio level / FM deviation within a specified time interval.
MPX Dev.	Show/Select if the MPX signal should be monitored for exceeding a definable MPX level / FM deviation value. An exceeding is actively identified if it occurred longer than the defined delay time and is above the limit more than 10% of the time.
MPX Power	Show/Select if the MPX power should be monitored for exceeding a definable value. An exceeding is actively identified if it occurs longer than time T1 and is reset if the measured value is below the definable value longer than time T2.
No Sync	Show/Select if a lost of the RDS synchronization should be monitored.

Tab [RDS Data] of the window
"Edit Dataset":

| PI	Show/Select the PI to be monitored.
PS	Show/Select the PS to be monitored.
TP Change	Show/Select if the TP should be monitored for a change.
ODA	Show/Select if the received data should be observed for ODA content. Additionally it is configurable how long the system waits for ODA data before alerting.
TMC	Show/Select if the received data should be observed for TMC content. Additionally it is configurable how long the system waits for TMC data before alerting.
TA	Show/Select if the TA bit should be monitored. It is monitored if the TA bit is set longer than the defined time interval.
No TA	Show/Select if the TA bit should be monitored. It is monitored if the TA bit has not been set longer than the defined time interval.
Block Error	Show/Select if the RDS block error rate should be monitored. It is monitored if the defined percentage value is exceeded for more than the defined time interval.
Groups	Opens a new window for the configuration of the group monitoring. Details about the group monitoring can be found on the next page.

Window "Groups":

Window for the configuration of the group monitoring.

8 different group types can be monitored. The following settings are available: The group type to be monitored, how long the monitoring waits for corresponding data, the group channel (if applicable), and if the monitoring just checks for data or changing data.
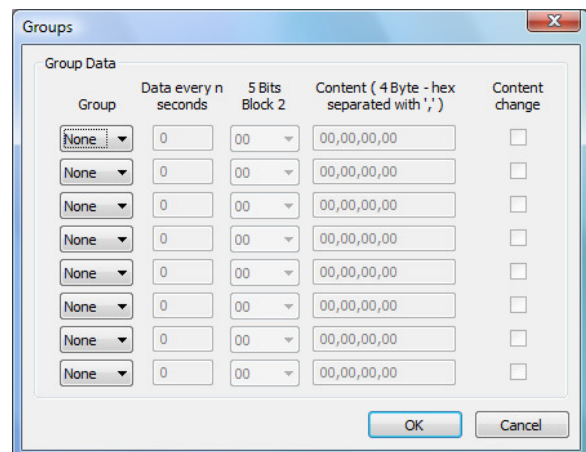
Tab [RDS Data]

The tab [RDS Data] is for viewing the received RDS group data - displayed as hexadecimal data or as decoded data by the external RDS soft decoder.
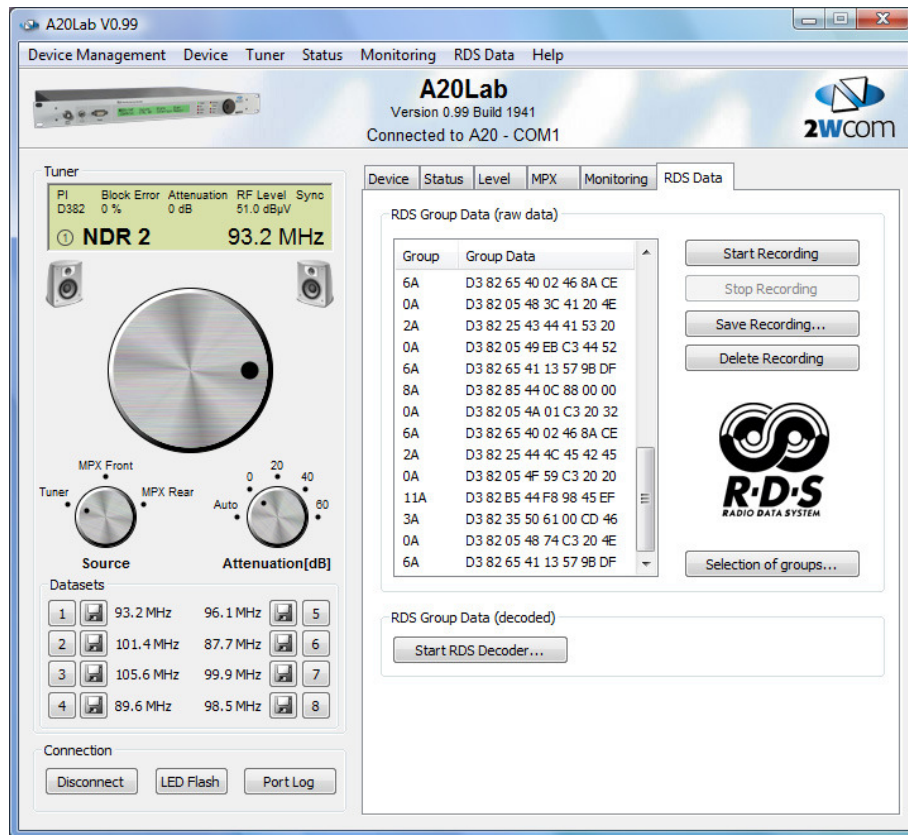

The button [Selection of groups…] can be used to select the RDS groups that are considered for the RDS group recording.

The button [Start Recording] can be used to start the RDS group recording and the display of the hexadecimal group data in a list.

The button [Stop recording] stops the RDS group recording. If the recording is stopped and the RDS group data list contains data, the button [Save recording…] can be used to save the recorded data as a text file. To delete the recorded data, the button [Delete Recording] can be used.

The button [Start RDS Decoder] can be used to start the external RDS soft decoder application. The RDS soft decoder shows the decoded RDS content like PI, PS, PTY, RT, RT+, TMC etc. (please see separate documentation).
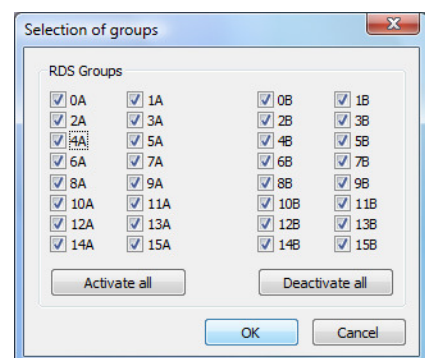
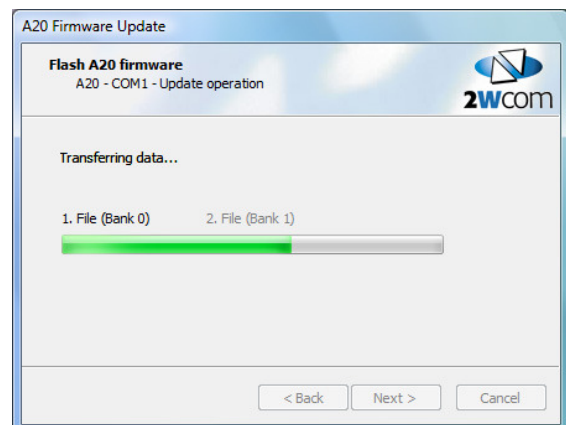**Transfer of a new A20 firmware version to the instrument**

A20Lab includes a function to transfer a new A20 firmware version to an A20 instrument.

If a new firmware version file has been released and is present as file on the control PC, the following steps are necessary to transfer the firmware to the instrument via a stable TCP/IP or RS-232C connection.

• Select an instrument in the tree view with a mouse-click. (Disconnect, if a data connection is active.)

• Then the button [A20 Firmware Update] is available on the tab [Device]. Activate the button by a mouse-click.

• An "Open file" window appears. Navigate to the specific firmware file "BANK0.BIN" and open it.

• Then a data connection to the A20 will be established. The version of the firmware to be flashed and the current instrument firmware will be determined and displayed in a dialog as shown on the right-hand side. As the flashing process is not already started, it can be canceled without any problems and changes in the instrument.
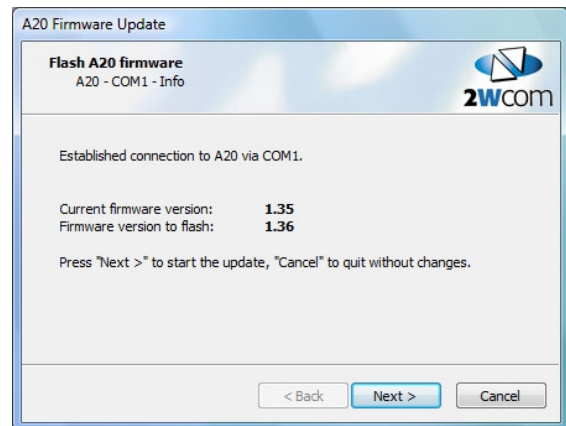

• A mouse-click on [Next >] starts the firmware transfer process. This is indicated by a progress bar. Two files (Bank 0 and Bank 1) are transferred consecutively. The instrument LCD shows "Flashing Bank 0" and "Flashing Bank 1" consecutively and also shows a progress bar. Additionally the LED´s of the instrument are activated cyclical.

- After transferring, the instrument shows "Burn" and performs a reset. To verify the successful transfer of the firmware, a data connection is established to read-out and display the present firmware version. The A20 is then ready for service again.
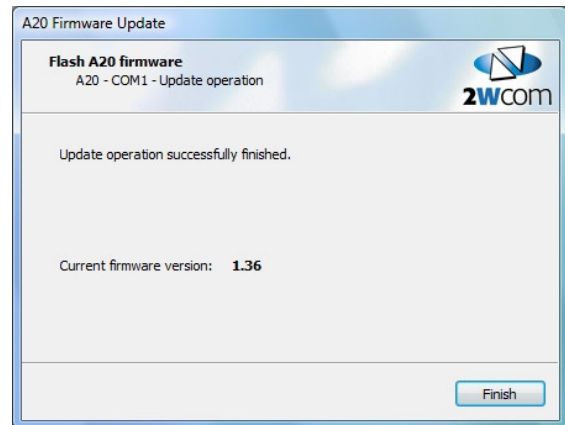
- The transfer fails if the connection to the instrument is interrupted during the process. In this case a window as shown on the right-hand side is displayed. The window shows the type of problem and enables to display a log of the UECP data communication by a mouse-click on [Show log file…].
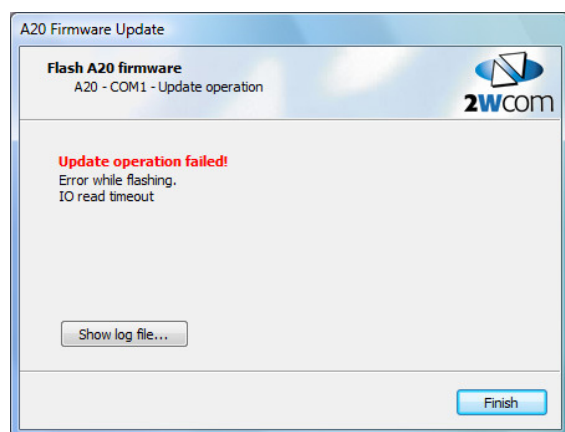
- In case of an update error, a restart of the instrument is necessary. The instrument then shows "Flash bad" and cannot be operated. After starting the update process, A20Lab automatically detects if the A20 is in boot loader mode and displays a corresponding message. However, the firmware update can be transferred as already described. After the successful transfer, the instrument is ready for service again.
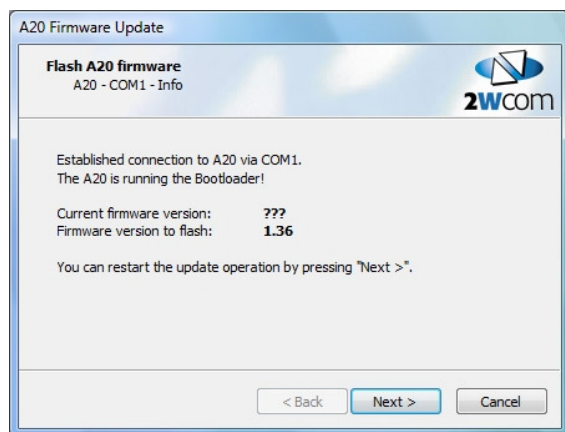
**Transfer of a new A20 DSP firmware version to the instrument**

A20Lab includes a function to transfer a new A20 DSP firmware version to an A20 instrument. A requirement for this is, that the present DSP firmware version is V2.0 or higher.

If a new firmware version file is released and is present as a file on the control PC, the following steps are necessary to transfer the DSP firmware to the instrument via a stable TCP/IP or RS-232C connection.

• Select an A20 instrument in the tree view with a mouse-click. (Disconnect, if a data connection is active.)

• Then the button [DSP Firmware Update…] is available on the tab [Device]. Activate the button by a mouse-click.

• An "Open file" window appears. Navigate to the specific firmware file "XXXXX.DSP" and open it.

• Then a data connection to the A20 will be established to check if the current DSP firmware version of the A20 supports an update. If this is not the case, a window as shown on the right-hand side is displayed.
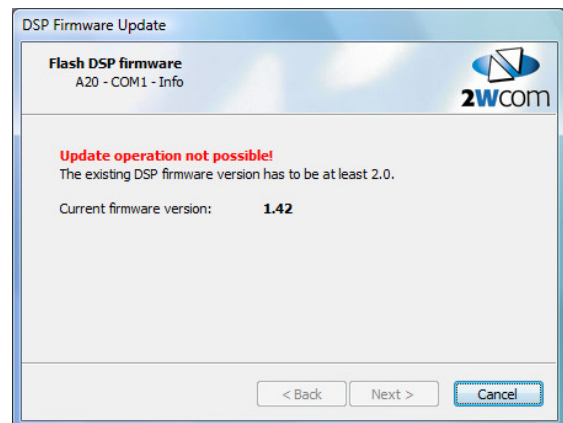

• If a DSP update is supported, the version of the firmware to be flashed and the current instrument DSP firmware will be determined and displayed in a dialog as shown on the right-hand side. As the flashing process is not already started, it can be canceled without any problems and changes in the instrument.
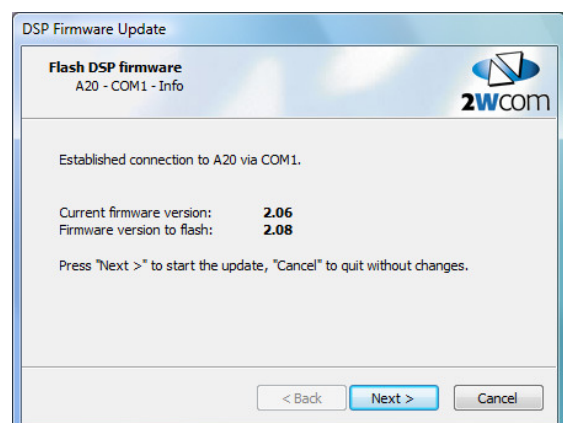
- A mouse-click on [Next >] starts the DSP firmware transfer process. This is indicated by a progress bar. The instrument LCD shows "Writing DSP flash data…" and then "Flashing DSP…".
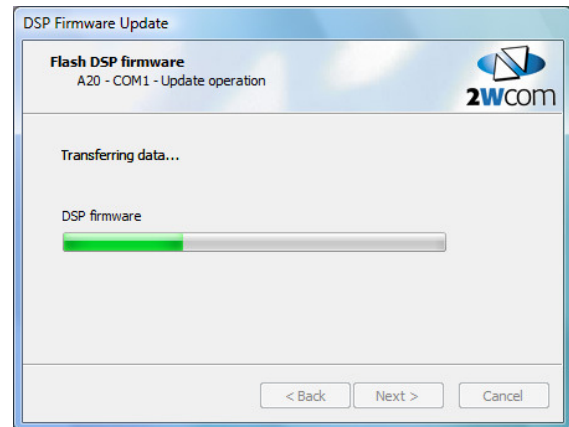
- After flashing the DSP firmware, the A20 performs a reset. To verify the successful transfer of the firmware, a data connection is established to read-out and display the present firmware version. The A20 is then ready for service again.
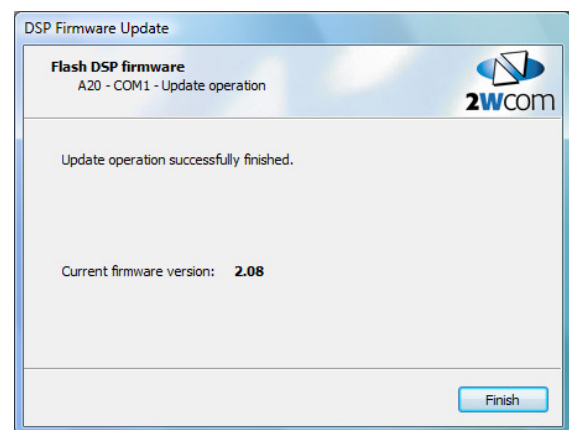
- The transfer fails if the connection to the instrument is interrupted during the process. In this case a window as shown on the right-hand side is displayed. The window shows the type of problem and enables to display a log of the UECP data communication by a mouse-click on [Show log file…].
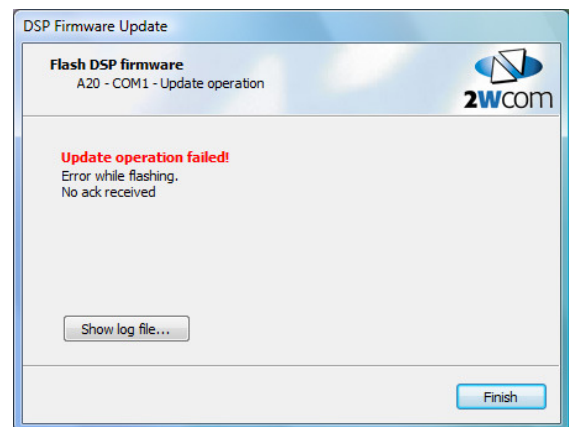
- In case of an update error, a restart of the instrument is necessary. Then, the DSP firmware update can be transferred again as already described. After the successful transfer, the instrument is ready for service again.

6. Command options

A20Lab can be started by using command options to establish automatically a data connection to an A20 instrument.

Possible command options:

/COM[:*x*]   x: Number of the COM port; default is 1
/IP:ipaddr[,port]   ipaddr: IP-address
                          port: Port number; default is 6666

Example:

A20Lab.exe/COM:5
A20Lab.exe/IP:192.168.14.10,8000

The software immediately tries to connect the A20 instrument with the given command options. If the connection fails, a corresponding message is generated and A20Lab is closed.

If the connection is established, A20Lab first looks if the connected A20 is part of the existing tree-view structure. If the connected A20 is already part of the structure, the existing default datasets (part of the locally stored folder "LocationData") are used. If the A20 is not part of the structure, a temporary folder with the data of the folder "ScanData" is created for this A20. This folder is deleted automatically, if the A20 is disconnected later on.