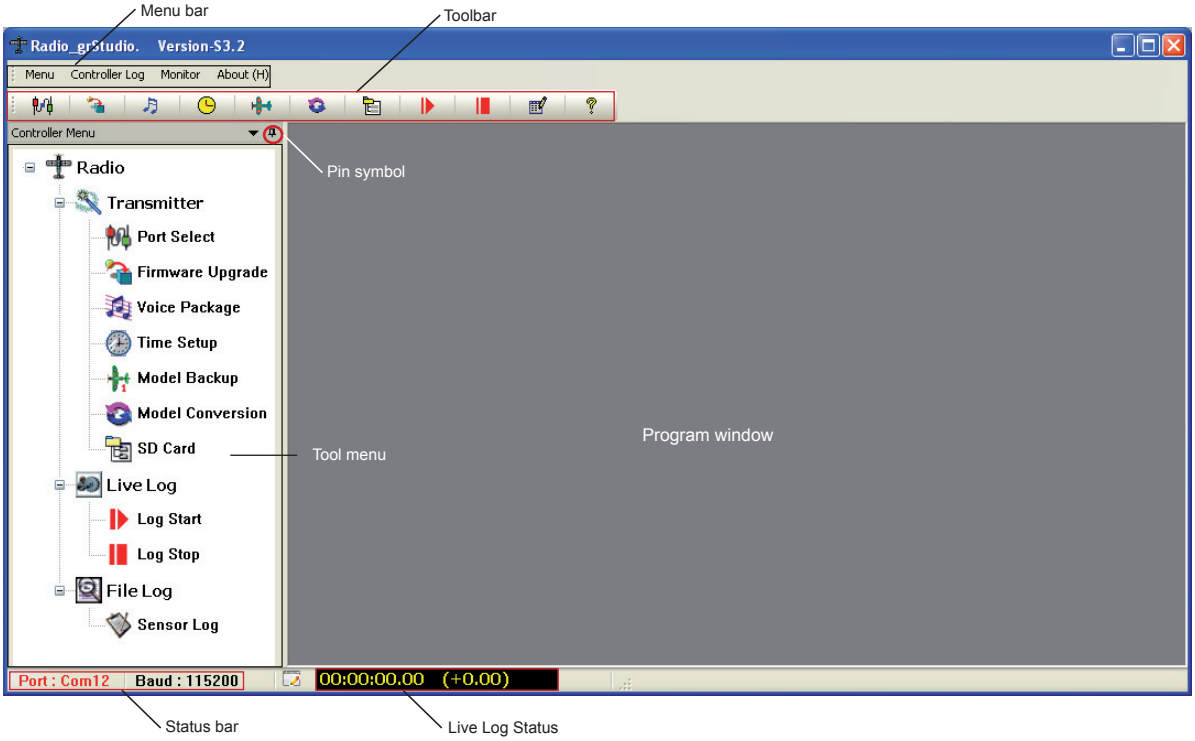
Software Graupner Radio Studio

Graupner Radio Studio provides a means of managing Graupner HoTT-series transmitters. For example, the software makes it easy to load firmware updates or voice packages, back-up model memories, and save log files from the transmitter for subsequent viewing.
A further special feature is the live output of sensor data from a variety of HoTT sensors or modules - such as the General Air Module - which can then be viewed in graphic form on a PC.

1. INSTALLATION

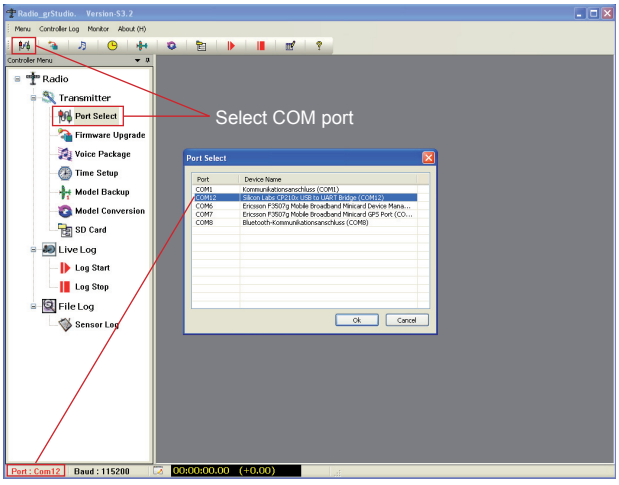
The first step is to install the USB drivers (Silicon Labs CP210x) and the Radio_grStudio download on your computer; these items are located in the Download area of “HoTT Software and Updates” at www.graupner.de, which contains all the available software for HoTT products. Follow all the on-screen instructions during the installation process, then start Radio_grStudio by double-clicking on the program icon on your desktop.
Please note: under Windows 7® you must then remove the write-protect attribute from the program folder X:\Programs\Graupner, as the program creates the back-up folder in this directory.

2. PROGRAM OVERVIEW



Like all Windows programs Graupner Radio Studio uses the windows which are typical of this operating system. The illustration describes the individual program segments, and the following chapters refer to these terms repeatedly. If the Function menu is not visible, open it by running the mouse pointer over the “Controller Menu” button at top left in the program window. You can also open the menu permanently by clicking on the Pin symbol.

3. SETTING UP THE PROGRAM



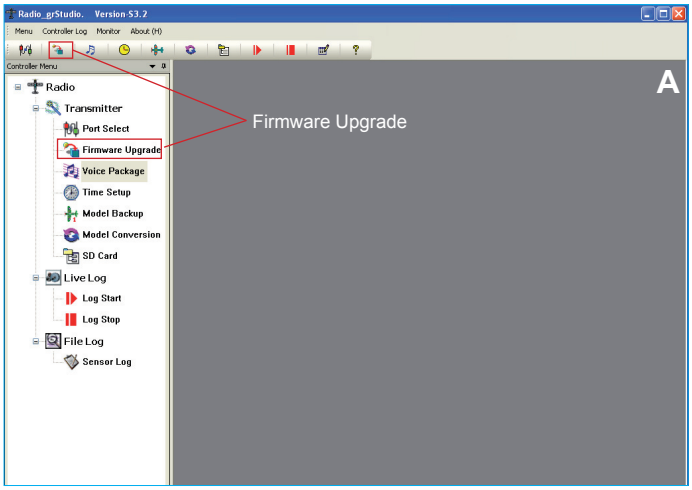
Connect the USB lead (PC-USB / Mini-USB) to the computer, and then to the USB socket on the back of the transmitter. Switch the transmitter on.
Select Menu / Port Setup in the menu bar, and enter the COM port to which the Silicon Labs USB driver is assigned. Alternatively you can select the connection symbol at far left in the toolbar.
Press OK. If the COM port is not displayed, check in the Windows Control Panel that the driver has been correctly installed.
The selected COM port is shown at bottom left in the status bar.

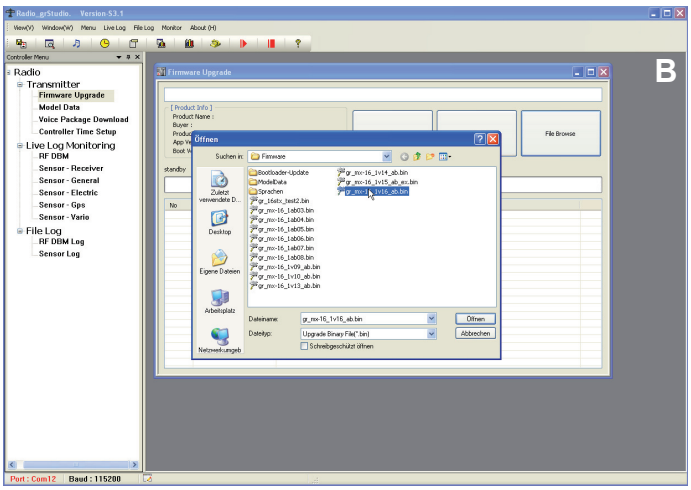
4. TRANSMITTER PROGRAM SEGMENT

The “Transmitter” function menu groups together those program segments which are used to update the transmitter, and back-up data or model memories.

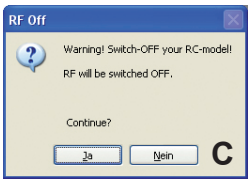
4.1 Updating the transmitter firmware:

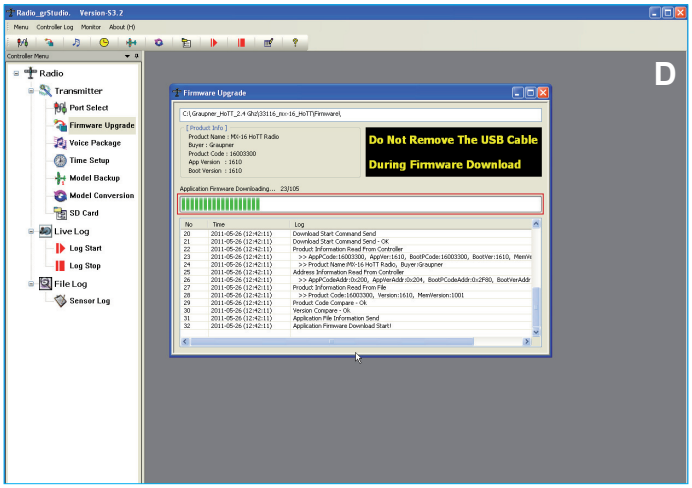
1. Switch the transmitter on.
   Connect the USB lead to the computer, then to the USB socket on the back of the transmitter.

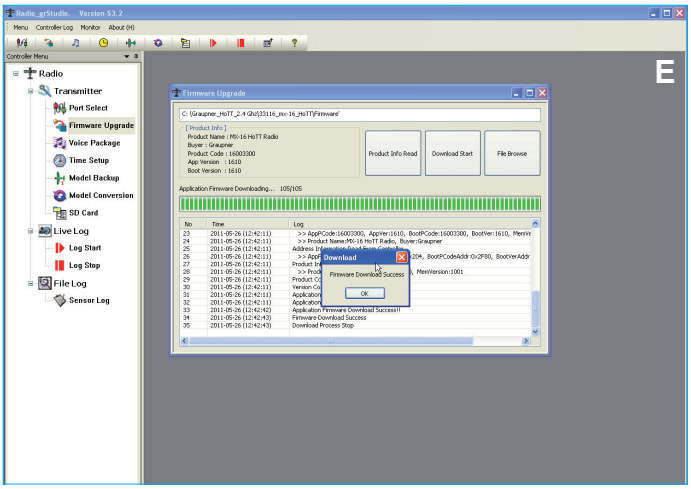


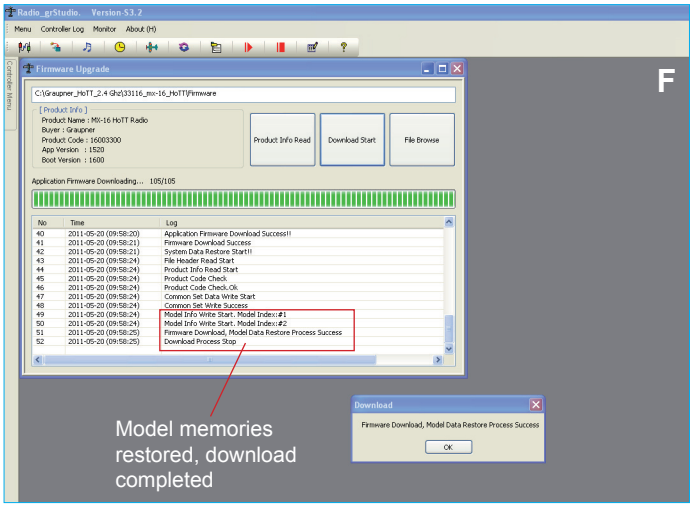


2. Locate “Transmitter” in the left-hand Function menu, and open the “Firmware upgrade” point - or select the second symbol in the toolbar (Fig. A).
3. Press the “File Browse” button, and look for the current firmware file in the program window which now opens, e.g. gr_mx-16_XvXX.bin for the mx-16 (B).
4. Press the “Start Download” button to initiate the update process. A pop-up window “RF OFF” opens, to remind you that the transmitter’s RF section must be switched off during the update process. To avoid potential problems, you should - if you have not already done so - switch the receiver off now (C) and then click ‘Yes’. The progress of the update is indicated by the “Application firmware downloading … XX/XX” progress bar, and the log entries in the table below it. The transmitter’s screen also displays the message “Firmware download - please wait … Progress XX/XX” (D).









Caution: the USB lead must not be disconnected during the update process! Ensure that the USB connectors at the transmitter and PC are making good contact, and cannot shift.

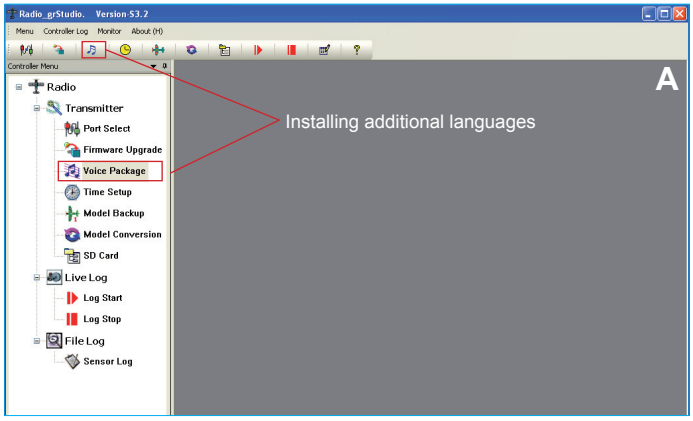
5. An indicator melody from the transmitter, and the appearance of the message “Firmware Download Success – Download Process Stop” in the table informs you that the update process has been completed successfully. The transmitter screen then reverts to the “mx-16 Graupner” start-up display showing the current firmware version (E).
6. Model memories are automatically adopted, and are directly converted, even from older firmware versions. You therefore do not need to back-up your model memories before carrying out the update (F).
7. Switch the transmitter off, and remove the USB lead.
8. If the update process should be interrupted, the whole procedure must be repeated.

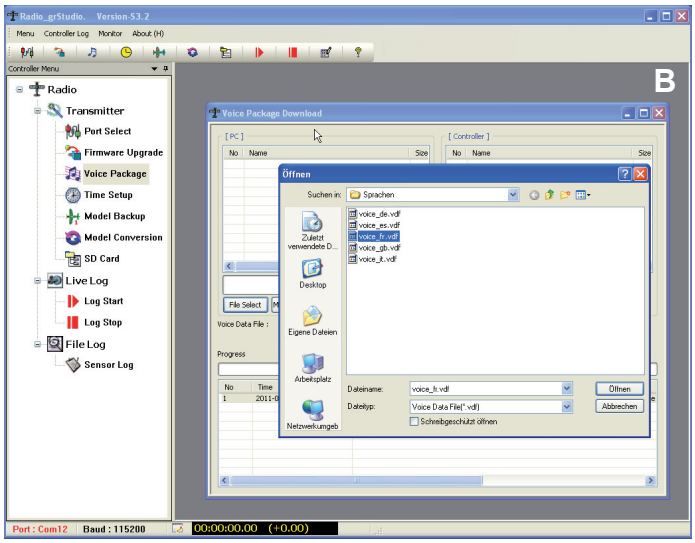
4.3 Voice output - installing additional languages:

You can also install your preferred voice file "voice_XX.vdf" using the Radio_grStudio software, e.g. if you do not have a Micro-SD card to hand.

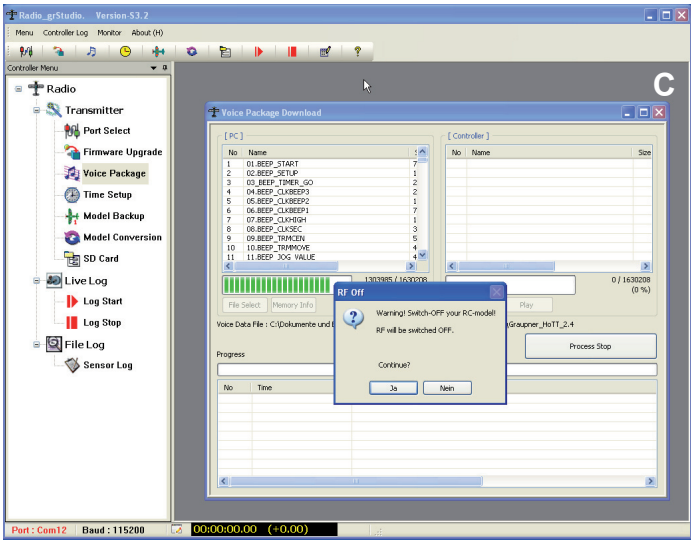
Please note: only one voice file can be stored in the transmitter, i.e. the existing voice file is overwritten, and must be loaded back into the transmitter if and when required using the software or an SD card.

1. Switch the transmitter on. Connect the USB lead to the computer, then to the USB socket on the back of the transmitter.
2. Open the "Voice Package" point in the left-hand function menu under "Transmitter"" - or select the third symbol in the toolbar (A).

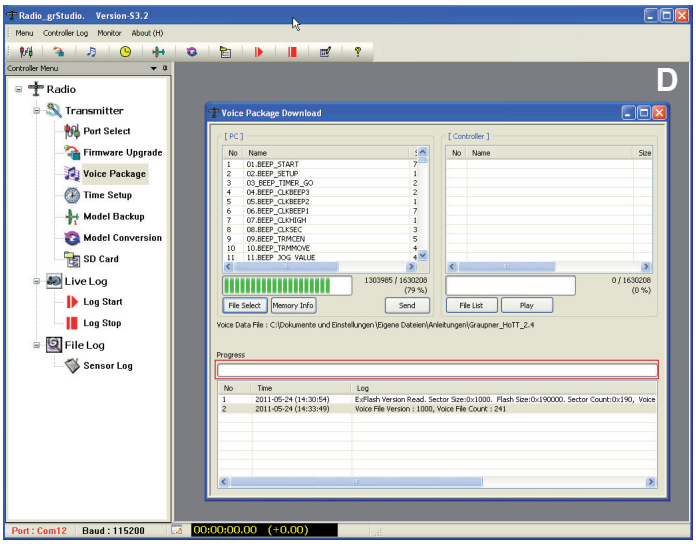


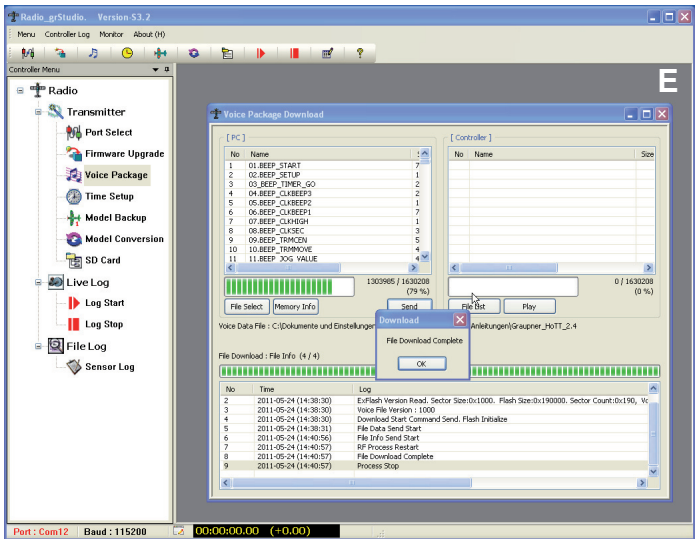


3. A window [PC] now opens; press the "File Select" button in the left-hand part of the window and look for your preferred voice file "voice_XX.vdf" in the "Open" window. If you have forgotten to switch the transmitter on, the pop-up window "Flash Size Unknown" appears, and the process is interrupted. If this should happen, switch the transmitter on and repeat the procedure (B).
4. Now press the "Send" button to start the process. A pop-up window "RF OFF" opens, to remind you that the transmitter's RF sec tion must be switched off during the update process. To avoid potential problems, you should - if you have not already done so - switch the receiver off now (C). The progress of the download is indicated by the "Progress (XXX / XXX)" progress bar, and the log entries in the "File Data Send Start" table below it (D).

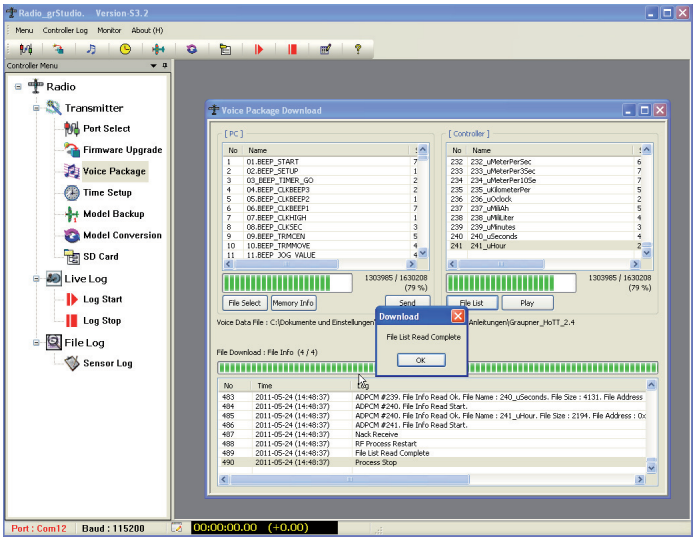


5. The appearance of the message "File Download Complete – Process Stop" in the table, and in a pop-up window, informs you that the update process has been completed successfully. Switch the transmitter off, and remove the USB lead (E).
6. If the update process should be interrupted, the pop-up window "File Data Send Fail" appears. If this should happen, you must repeat the whole procedure.
7. The selected voice package is now installed, but it will not be displayed correctly in the "Secret mode" menu, which still shows the voice package previously selected. To avoid subsequent confusion we therefore recommend that you copy the voice files onto the Micro-SD card and install them from there (see the transmitter manual for details).





You can read out the voice file stored in the transmitter

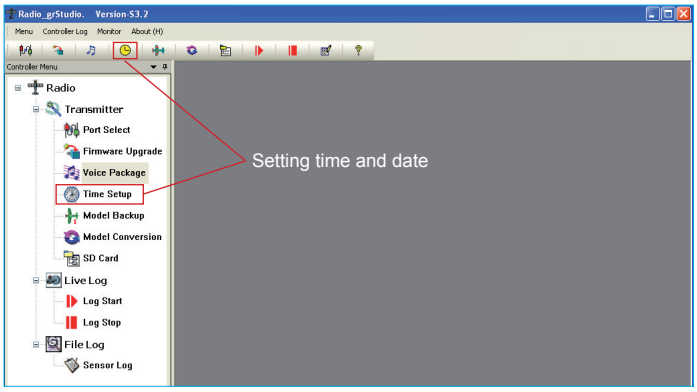


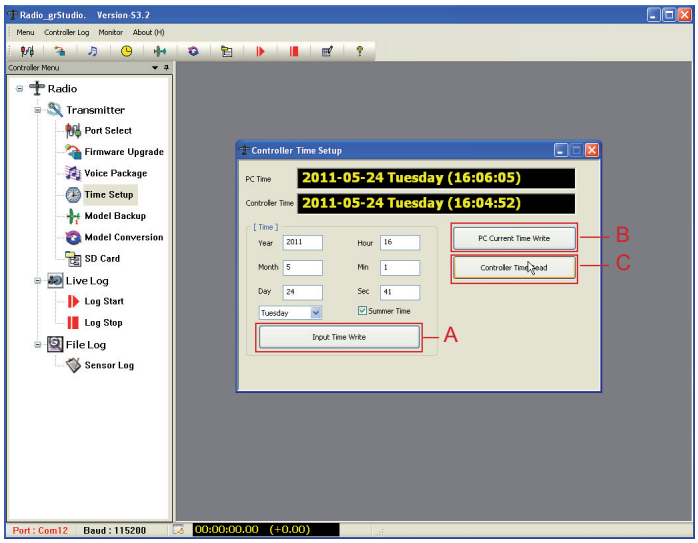
by pressing the “File List” button in the right-hand part of the window [Controller]. When the complete file has been read out, a pop-up window “File List Read Complete” appears. The individual voice files are presented in a list.

4.4 Setting the time and date - Time Setup

The “Time Setup” program segment enables you to set the correct time and calendar date on the transmitter easily using a computer.

1. Open the “Time Setup” point in the left-hand function menu under “Transmitter” - or select the yellow clock symbol in the toolbar.
2. Switch the transmitter on. Connect the USB lead to your computer, and then to the USB socket on the back of the transmitter. You can either:



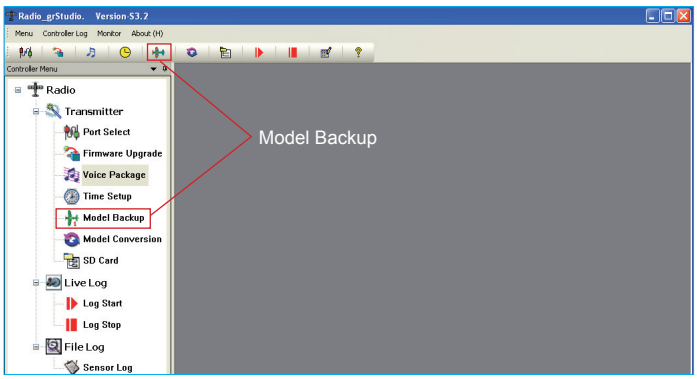


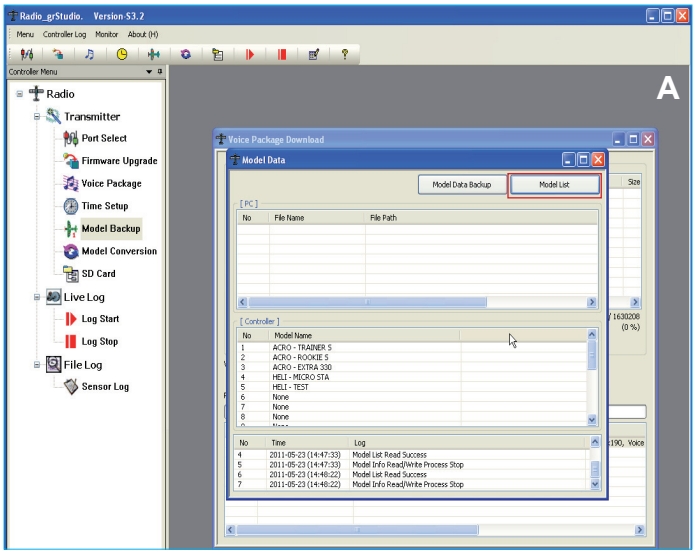
set the time and data manually in the left-hand part of the window [Time], and then load it into the transmitter by clicking on the “Input Time Write” button (A), or
adopt the “computer time” in the right-hand part of the window, i.e. directly transfer the time set on the computer by clicking on the “Current Time Write” button (B). The transmitter time can be read out using the “Controller Time Read” button (C).
The times, the weekday and the date are displayed in the top part of the window: at the top you will see the “PC Time”, at the bottom the “Controller Time” stored in the transmitter. The “English” date format is used, i.e. year - month - day. The day is also displayed in the English language. However, the time is shown in the usual 24-hour format.

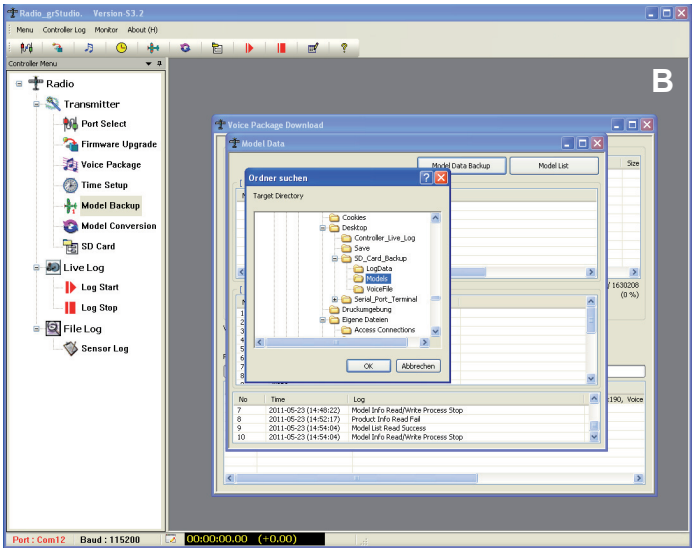
4.5 Backing up model memories - Model Backup

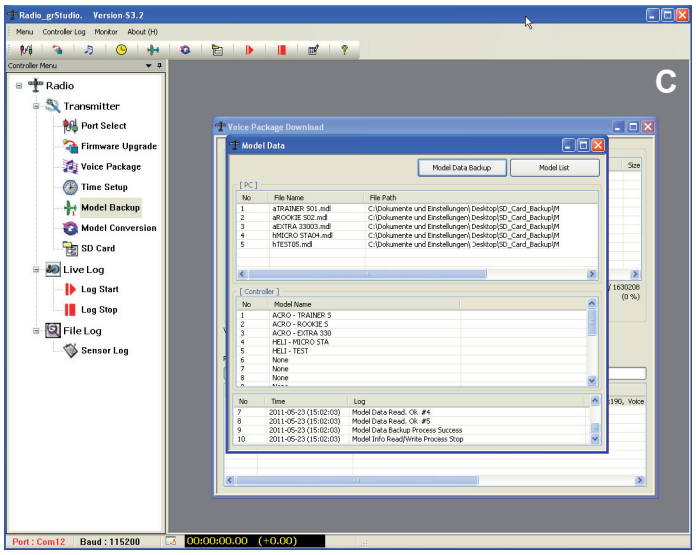
This program segment provides a simple means of backing-up the transmitter’s model memories on your PC.

1. Open the “Model Backup” point in the left-hand function menu under “Transmitter” - or select the aircraft symbol in the toolbar.
2. Switch the transmitter on. Connect the USB lead to the computer and then to the USB socket on the back of the transmitter.







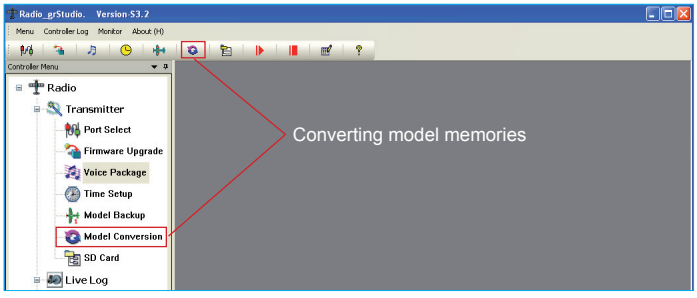


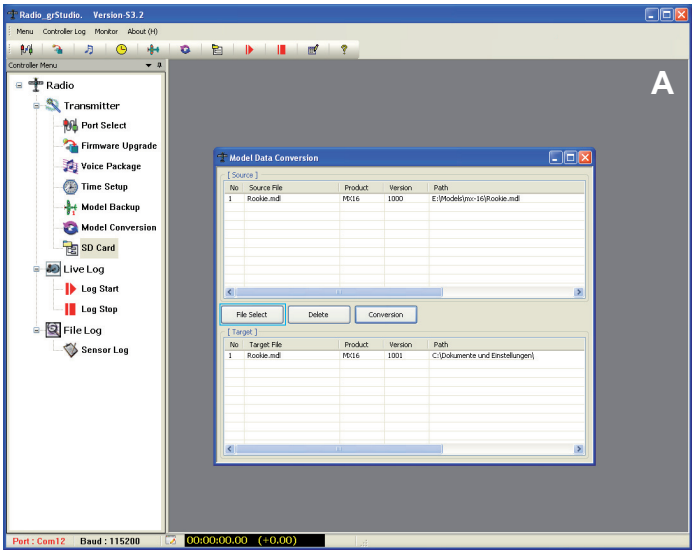
3. Press the “Model List” button at top right, and the software reads out the transmitter’s model memories and lists them in the [Controller] window. Model memories containing fixed-wing model aircraft start with “ACRO”, those containing model helicopters with “HELI” (A). If you have forgotten to switch the transmitter on, the message “Product Info Read Fail” appears in the bottom line, and the process is interrupted. If this should happen, switch the transmitter on, and repeat the procedure.
4. Now press the “Model Data Backup” button in order to initiate‘ the back-up process. Select the desired model memory in the window which now appears, and press OK (B).
5. The backed-up model memories are displayed in the top part of the [PC] window (C).

4.6 Converting model memories - Model Data Conversion

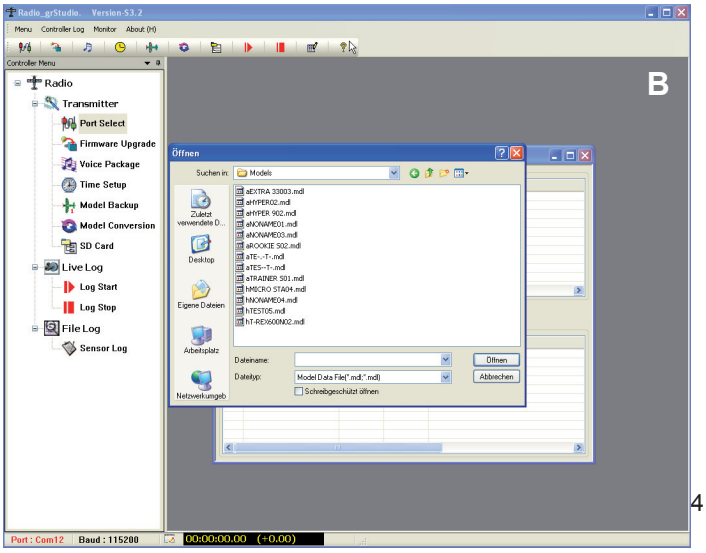
If you have backed-up transmitter model memories on your PC when an earlier version of the firmware was in use, this part of the program enables you to convert the data to the new form, and also to convert the memories between mx-12 HoTT and mx-16 HoTT transmitters.

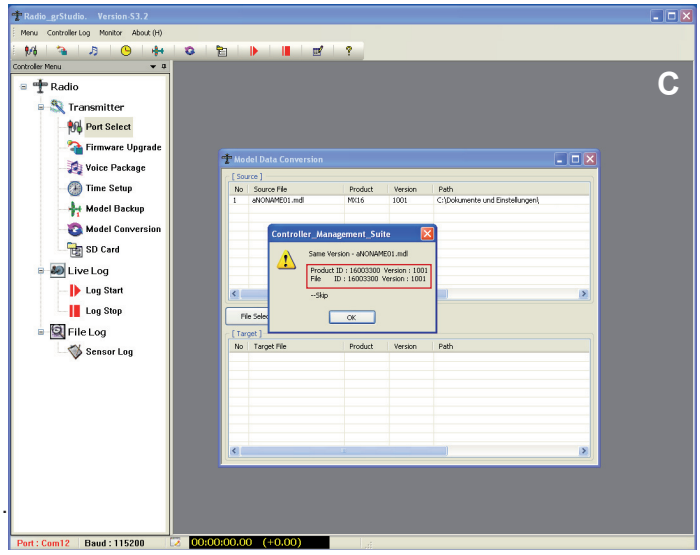
1. Open the “Model Conversion” point in the left-hand function menu under “Transmitter” – or select the circle symbol in the tool bar.
2. Switch the transmitter on. Connect the USB lead to the computer, and then to the USB socket on the back of the transmitter.

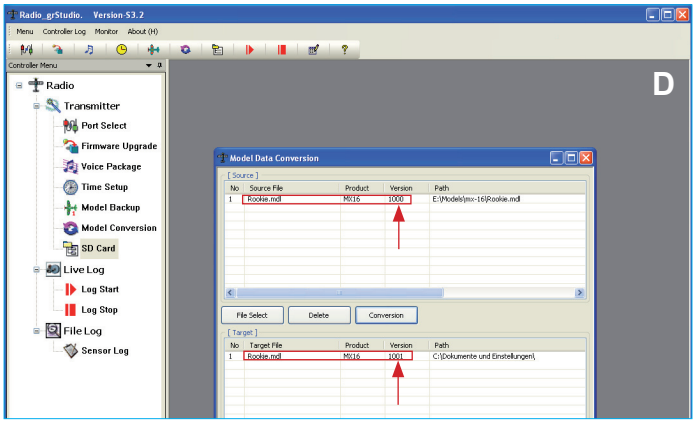




3. Now click on the “File Select” button to select the desired model memory file(s): these are listed in the top part of the window [SOURCE] with the name (Source File), transmitter model (Product) and firmware version (Version). *Please note:* all the files listed here will be converted. For this reason, if you have selected files which you do not wish to convert, you can erase them from the list using the “Delete” button (A).





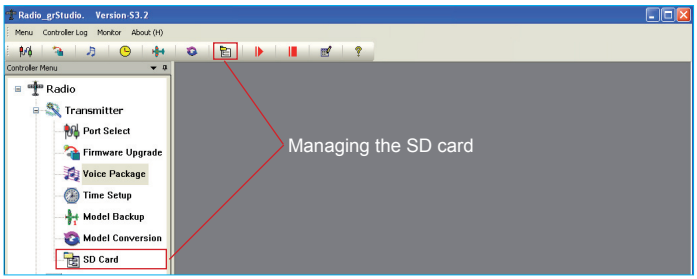


4. Once all the files to be converted are listed correctly under [SOURCE], press the “Conversion” button. A pop-up window now opens, in which you should select the appropriate file folder; click OK (B).
5. The memory conversion process now starts. If you have selected a current model memory file, i.e. no conversion is necessary, the pop-up message “Save Version - Skip” (C) appears. Press OK, and the file is not converted. Conversely, if you have selected an older file, or one from a different model of transmitter, then the software carries out the conversion, and the file appears in the bottom part of the window together with the current version number [TARGET] (D).
6. The converted files can now be copied directly into the “Models” folder on an SD card using a suitable card reader in the PC, or transferred to the SD card in the transmitter using a USB lead and the program segment “SD card”.

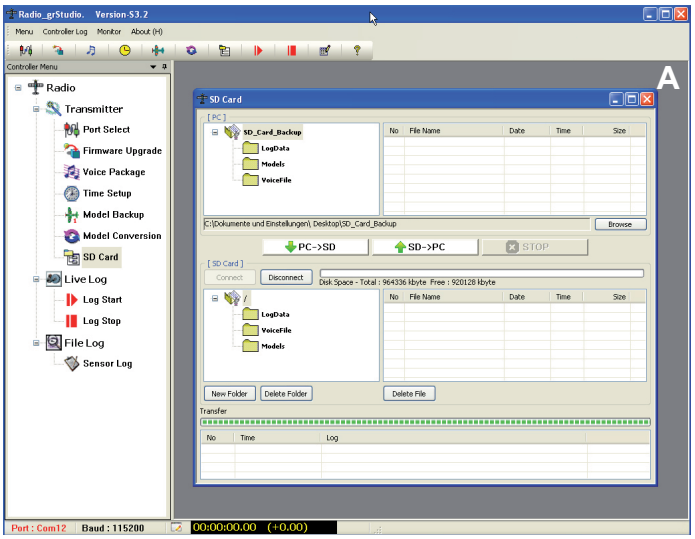
4.7 Managing the SD card in the transmitter - SD Card

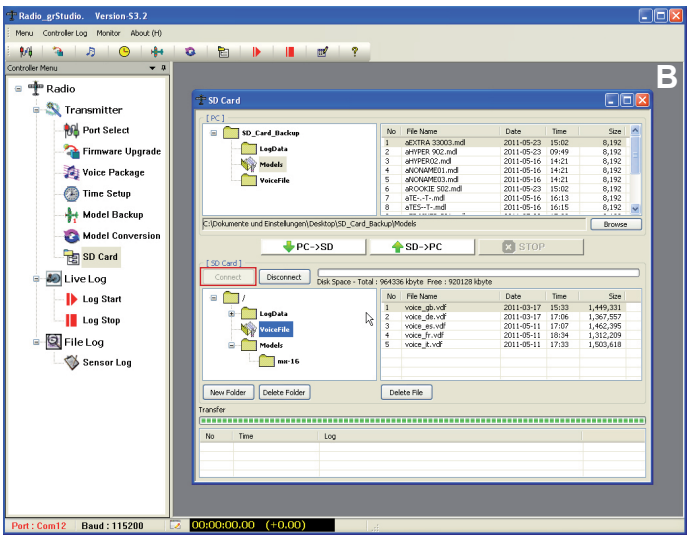
The purpose of this program segment is to manage the folders or data on the SD card installed in the transmitter, or to copy them directly from the SD card to the PC, or from the PC to the SD card.

1. Open the “SD card” point in the left-hand function menu under “Transmitter” - or select the file folder symbol in the toolbar.
2. Switch the transmitter on. Connect the USB lead to the computer, and then to the USB socket on the back of the transmitter.



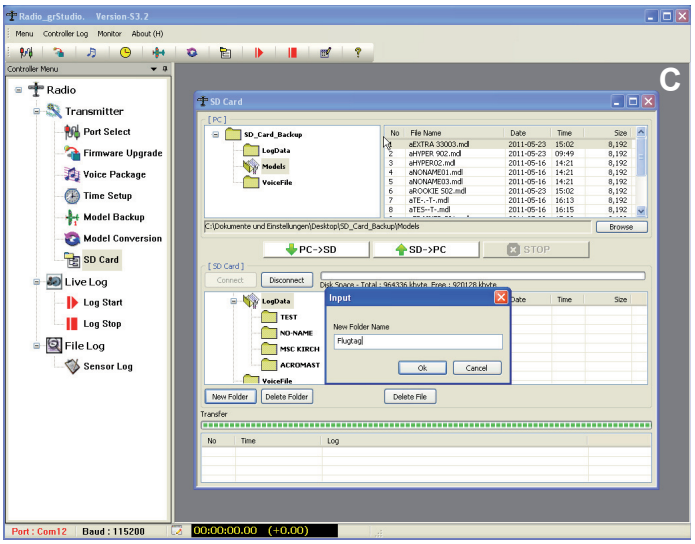
3. The upper part of the window [PC] displays the folders from the SD card which are backed-up on the PC (SD_Card_Backup); the lower part of the window shows those stored on the SD card installed in the transmitter. Please note: the first time you open this program segment, the back-up folder “SD_Card_Backup” is automatically created in the same folder where the file “Radio_grStudio.exe” is stored (A).
4. Press the “Connect” button to display the file folders on the SD card in the transmitter in the lower part of the window. You can

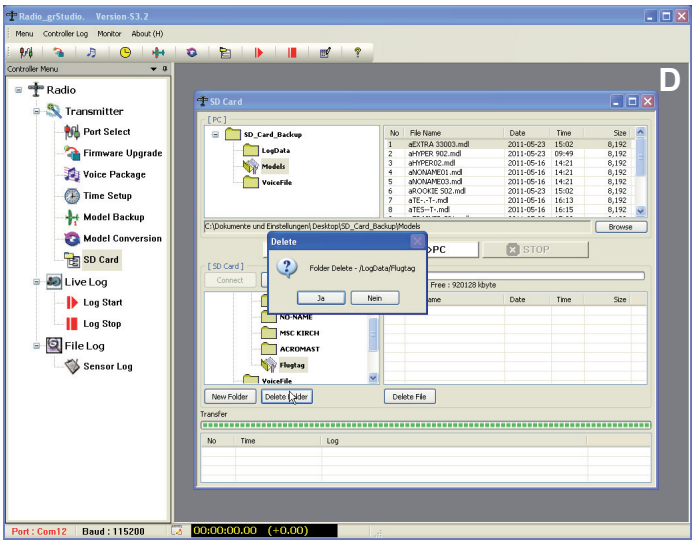


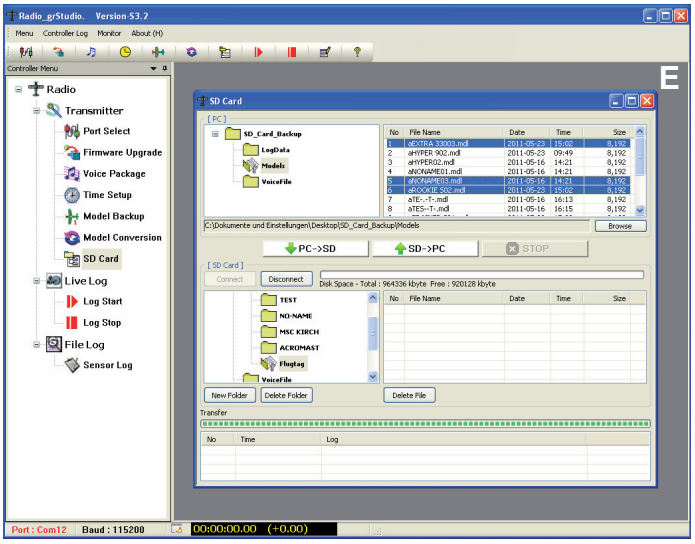


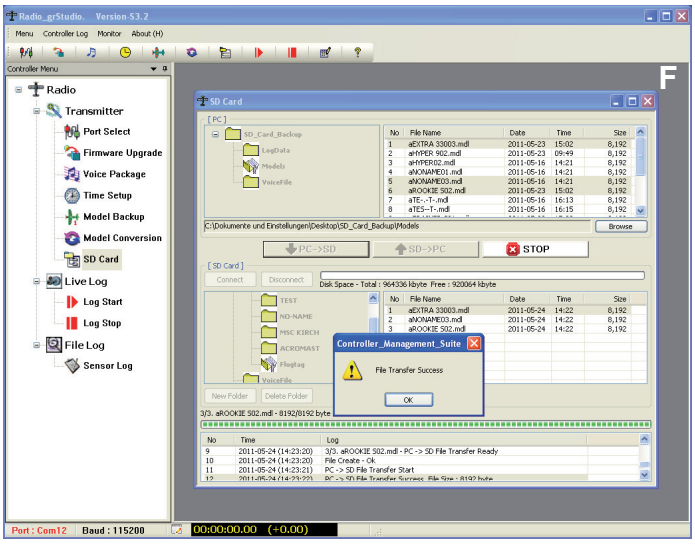
now click on the individual folders to see the files stored in them (B).

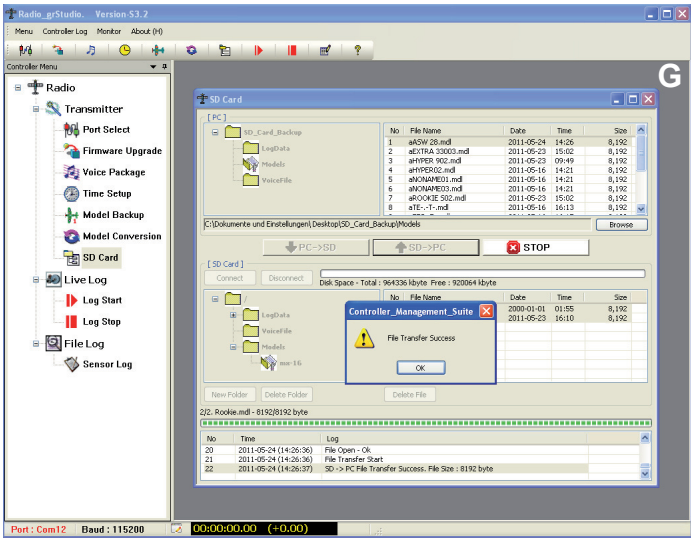
5. You can create new folders on the SD card, or erase folders which are no longer required; this is accomplished by pressing the “New Folder” or “Delete Folder” buttons (C - D).
6. If you wish to transfer files from the PC to the transmitter, double-click on the appropriate folder in the upper left-hand part of the window, then mark the files to be transferred in the right-hand part of the window (E).









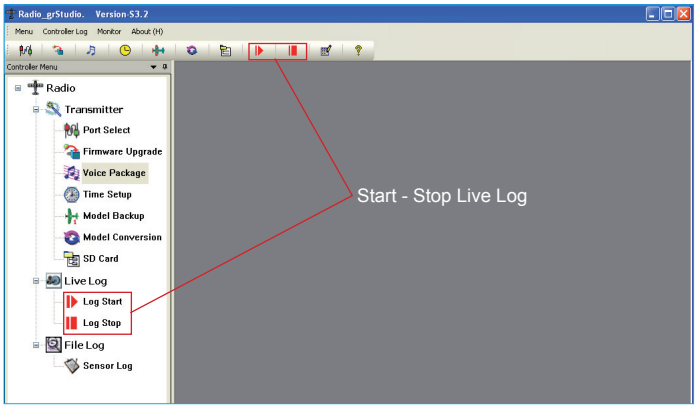


7. The transfer is initiated by clicking on “PC -> SD”. The progress bar starts, and details of current progress are also indicated in the window below it. When the transfer is complete, the pop-up window “File Transfer Success” appears, and at the same time the files appear in the lower program window (F).
8. To transfer files from the transmitter to the PC, double-click on the appropriate folder in the lower left-hand part of the window, then mark the files to be transferred in the right-hand part of the window.
9. The transfer is initiated by clicking on “SD -> PC”. The progress bar starts, and details of current progress are also indicated in the window below it. When the transfer is complete, the pop-up window “File Transfer Success” appears, and at the same time the files appear in the upper program window (G).
10. Once all data have been transferred as desired, click on the “Disconnect” button to end communication between the PC and the transmitter. At this point you can also switch off the transmitter.

5. LIVE LOG PROGRAM SEGMENT - REAL-TIME DATA DISPLAY

The "Live Log" program segment can be used to display transmitter and receiver data, and the data from the optional sensors, "live" and in graphic form.

The on-screen display basically corresponds to the data display on the transmitter screen or on the Smart-Box.



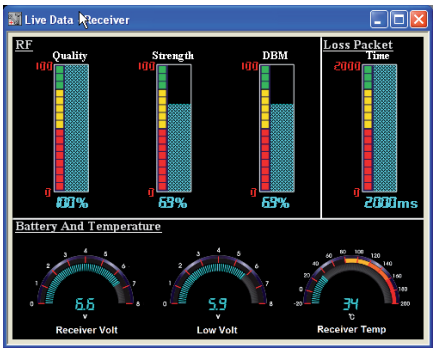
1. Connect the USB lead to the computer, and then to the USB socket on the back of the transmitter. Switch on the transmitter and your model.
2. Start the transmission by clicking on the "▶Play symbol" in the toolbar, or by selecting "Live Log" – "Log Start" in the menu line. As soon as the connection is active, the red X is replaced by a flashing green arrow symbol in the lower status line; at the same time the clock in the Live Log status line starts running. Playback can be halted with the "■Stop symbol"; when you do this, the green arrow symbol in the status line disappears.
3. The appropriate display windows now open automatically, according to the sensor activated in the transmitter's "Telemetry - select sensor" menu. In fact, you can open all the windows, but data will only be displayed in the window which is also active at the transmitter. The remaining windows simply display the values in "frozen" form, i.e. they are inactive.
4. As soon as you halt the live recording using the "■Stop symbol", a pop-up "Log Data Save" window appears, asking you whether you wish to save the files just logged; the files are saved in the folder entitled Controller_LIve_Log. Note: the first time you open this program segment the software automatically creates this back-up folder in the same folder which contains the file "Radio_grStudio.exe".

The following display windows are available, and can be opened manually in the menu bar under "Monitor":

5.1 RF DBM/RXSQ - visualises the occupation data for the 2.4 GHz band

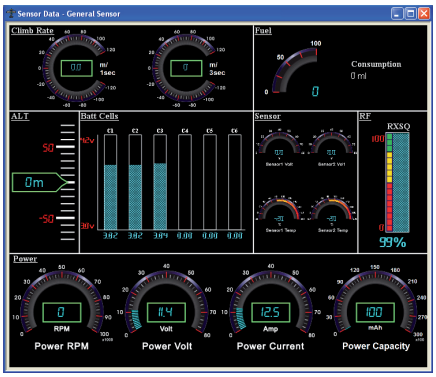
Displays the current RF status (analogous to the transmitter screen):
Upper row: receive performance in dBm of channels 1 – 75 on the 2.4 GHz band
Lower row: receive performance in dBm of the signal picked up at the receiver for channels 1 – 75 on the 2.4 GHz band

5.2 Sensor – Receiver:



Quality	Signal quality in %
Strenght	Signal strenght in %
DBM	Receive performance in %
Loss Packet	Shows the longest period in ms in which data packets were lost during transmission. In practice this is the longest time in which the radio control system switched to fail-safe mode
Receiver Volt	Actual receiver voltage
Low Volt	Minimum receiver operating voltage since switching on
Receiver Temp	Actual receiver temperature

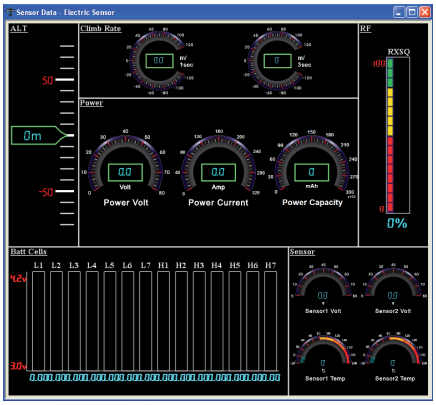
5.3 Sensor – General:



Climb Rate	Rate of climb or descent in m/1 sec. and m/3 sec.
Fuel	Fuel consumption in milli-litres
ALT	Altitude in metres
Batt Cells	If the balancer plug is connected, displays the individual cell voltages of cell 1 (C1) to cell 6 (C6)
Sensor 1/2 Volt	Actual voltage of the optional Sensor 1 or 2
Sensor 1/2 Temp	Actual temperature of the optional Sensor 1 or 2
RF RXSQ	Signal strength of the signal picked up by the receiver in %
Power RPM	Actual rotational speed from the optional RPM sensor
Power Volt	Actual voltage of the connected battery
Power Current	Actual current drain from the connected battery
Power Capacity	Actual consumed capacity from the connected battery

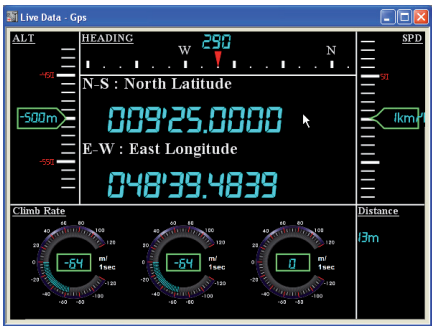
5.4 Sensor – Electric:

ALT	Altitude in metres
Climb Rate	Rate of climb or descent in m/1 sec. and m/3 sec.
Batt Cells	If the balancer plug is connected, displays the individual cell voltages of battery 1 (L1 - L7) and battery 2 (H1 - H7)
Sensor 1/2 Volt	Actual voltage of the optional Sensor 1 or 2
Sensor 1/2 Temp	Actual temperature of the optional Sensor 1 or 2
RF RXSQ	Signal strength of the signal picked up by the receiver in %
Power Volt	Actual voltage of the connected battery
Power Current	Actual current drain from the connected battery
Power Capacity	Actual consumed capacity from the connected battery



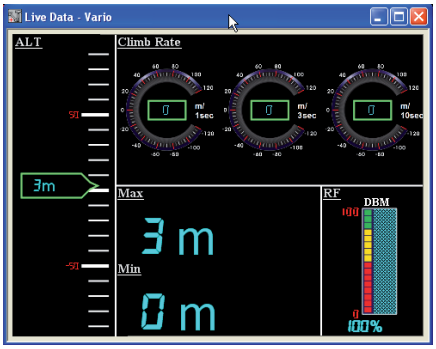
5.5 Sensor – GPS:

ALT	Altitude in metres
Climb Rate	Rate of climb or descent in m/1 sec. and m/3 sec.
Heading	Direction of flight in degrees
SPD	Actual speed in km/hr
Distance	Actual distance from the launch point in metres
RF RXSQ	Signal strength of the signal picked up by the receiver in %
NS: North Latitude	Northern latitude
EW: East Longitude	Eastern longitude



20. Sensor – Vario:

ALT	Altitude in metres
Climb Rate	Rate of climb or descent in m/1 sec. and m/3 sec.
Max	Maximum altitude since launch
Min	Minimum altitude since launch
RF RXSQ	Signal strength of the signal picked up by the receiver in %



6. FILE LOG PROGRAM SEGMENT– DISPLAY OF TRANSMITTER LOG FILES

The purpose of this program segment is to display the log files recorded by the transmitter. To start the transmitter's data log, the transmitter's timers must be active. As soon as a timer is started (it makes no difference whether it is a flight timer or stopwatch), data recording starts on the SD card in the transmitter - indicated by the progress bar inside the card symbol on the transmitter screen. The recording stops if the timer is halted or the transmitter is switched off.

Remove the SD card from the transmitter and insert it in your computer's memory card reader.

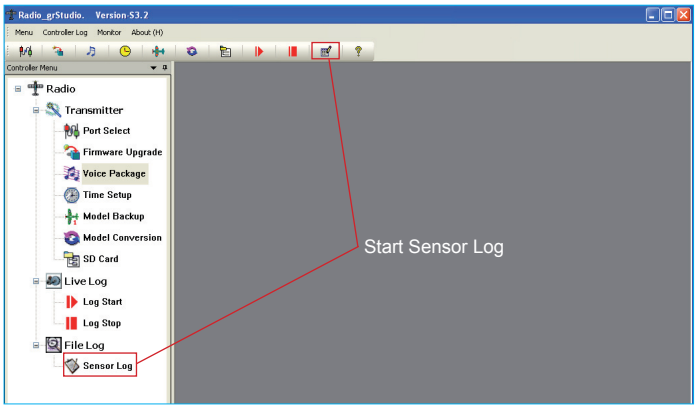
Open the "LogData" folder on the memory card. A folder bearing the name of the model memory is created for each model memory. Open the appropriate folder, i.e. the one corresponding to the model memory. The log files are stored chronologically by date. "0001_2011-3-15.bin", for example, means the first (0001) log file, recorded on 15.03.2011. If the timer is re-started, e.g. for the second flight of the day, this file is saved under the name "0002_2011-3-15.bin", etc.

If you now wish to view the log files, start "Sensor Log" to display all the data, including those from the sensors connected to the system.

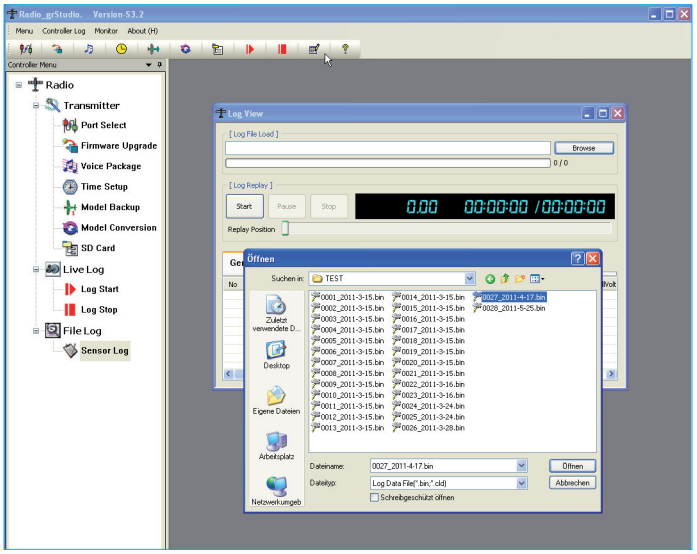
Caution: if Live Log is active - green arrow symbol in the status bar - then it is not possible to start playback - instead the "Live Log Monitoring" pop-up window appears. In this case you should end the recording by pressing the "■ Stop symbol", and then re-start Sensor Log.

6.1 Sensor Log

Press the “Browse” button, and a window opens. Open the appropriate file in this window by double-clicking on it. These can either be log files from the SD card with the file suffix *.bin, or data recorded by Live Log ending in *.cld. The file is now loaded, the status bar indicates progress, and the number of saved data sets is also displayed: “XXXX : XXXX”.
You can also select the tabs “General”, “Electric” etc. to view the saved sensor log files in tabular form.



Press the “Start” button to see a graphic representation: the appropriate display windows open automatically according to the saved sensor data; the windows are the same as those in the Live Log program segment. However, the tabular representation “Log View” is new: all data are listed in tabular form. It also features the new “Channel” tab, which records the servo positions (in µs) for all channels. If no sensor is connected during the recording, the “Receiver” and “RF DBM” windows open as a minimum, since these data are always recorded. The sequential digital display on the right, reading from left to right, shows the recording time of the individual log data in seconds since the start, the total elapsed time and the total duration of the data recording.



You can pause playback with the “Pause” button, and stop playback with “Stop”. It is also possible to click directly on the slider using the mouse, and move it to the desired position so that you can just play back one section.