

9XR Pro: Using SAM-BA to Restore a “Bricked” Transmitter

The Ersk9x open source firmware used by the Turnigy 9XR Pro computer includes an easy means of communicating between the transmitter and a computer, either via a USB cable or by copying files to a micro-USB card and inserting it in the transmitter.

This built-in capability supports upgrading the operating system (firmware) of the transmitter. It can also be used to link the transmitter to the Eepskye program, which among other things, enables programming to be performed on the computer and EEPROM files to be backed up to the computer.

What the firmware cannot do is to reload itself if the transmitter becomes unresponsive, a state often called “bricked”. In that case, the firmware must be erased from the transmitter and reinstalled. Re-installing requires the use of SAM-BA, a program for PCs written by Atmel, the maker of the microprocessor inside the 9XR Pro transmitter.

Requirements

As detailed below, SAM-BA is available for download from the Atmel Corporation.

SAM-BA can run under Windows XP, 7 or 8. There is no Macintosh version but SAM-BA can be run in a Boot Camp Windows partition.

To connect the transmitter to the computer, a USB cable with a Mini-B connector (as used by many older mobile phones) is required. The USB port is under a rubber flap on the bottom of the transmitter. Press the mini USB plug firmly into the socket to ensure that it connects.

Installing SAM-BA

- Go to the Atmel Corporation site and download the **SAM-BA Version 2.12** file. You will have to register temporarily with Atmel to do so.
- Unzip the file onto your desktop (i.e., right click on the .zip file and select ‘expand file’).
- Open the **sam-ba_2.12** file to open the wizard; follow the prompts. The wizard will ask if you wish to install the files in a folder called “Atmel” in the Program Files directory of your hard disk. Answer ‘Yes’ and continue with the prompts.
- The usual path is something like **C:\ProgramFiles\Atmel\sam-ba_2.12**. Write down or remember where to find this folder. Install a shortcut on the desktop when asked to do so by the wizard. Continue until the wizard is finished.
- Download the file **at91sam3s8-9xr.zip** from the following location [could change]:

<http://openrcforums.com/forum/viewtopic.php?f=118&t=4553&start=60#p65474>

- Unzip the file to a convenient location such as the desktop. It contains a folder called **at91sam3s8-9xr.tcl** (within which are three applet files and a couple of .tcl files) plus a file called **boards.tcl**.
- Within the folder where SAM-BA is installed is a folder called **tcl_lib**. Drag the folder you have just extracted into it. Answer ‘Yes’ to any request to overwrite existing files. The result should be that within the **tcl_lib** folder (1) the **boards.tcl** file is replaced (the date may be older than the one it replaces), (2) a new folder called **at91sam3s4-9x** is created, (3) a new folder called **common** is created.

To check the installation, connect the transmitter (turned OFF) to a USB port on your computer. When you turn the radio on you should see ‘USB’ on the screen. Start the SAM-BA program from the shortcut on the desktop and you will see a dialogue box. From the ‘Select your board’ menu choose **at91sam3s8-9xr**. If the result looks like the following image (except possibly for a different

COM number) and the 'Connect' button is not greyed out, you have been successful.



Write down the connection path accurately (including capitalization) for later reference.

(Note that if you are using Windows XP and the dialogue box shows blanks for connection and board, you may need to find and install a driver for "GPS Camera Detect.")

You can now quit SAM-BA. Use the Windows "Safely Remove Hardware and Eject Media" function, then turn off and disconnect the transmitter.

Note that the number following COM is that of the USB port into which you plugged your cable. Try to use this same port whenever you connect to your transmitter. If you do use another port, or forget the number of the one you used, press the Start button (Windows 7) and go to Devices and Printers. There under "Unspecified" you should see something like "GPS Camera Detect (COM5). Edit the COM number in the SAM-BA connection to match.

Using SAM-BA to Recover a Bricked Transmitter

A transmitter that is unresponsive ("bricked") because of a firmware issue requires that the ARM processor chip be restored to factory defaults and that fresh firmware be flashed to it using the SAM-BA program.

Note that uploading firmware files to the transmitter does not affect the eeprom memory (model definitions, etc.).

New releases of firmware are available at:

http://ersky9x.googlecode.com/svn/trunk/ersky9x_rom.bin

NOTE: It is important to connect the transmitter to your computer and turn it on before starting SAM-BA, otherwise the program will not work. Similarly quit the program before turning the transmitter off and disconnecting.

Erasing the Chip

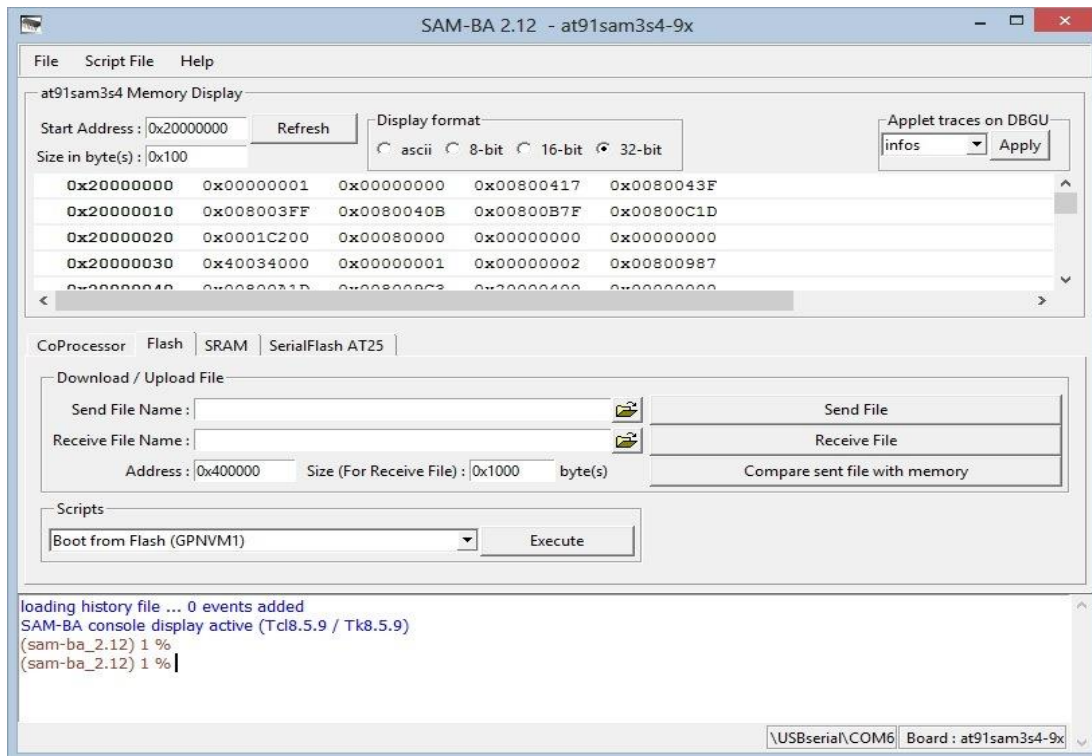
- While turning ON the transmitter, use a paperclip to press and hold the small round Erase Button. It is in a hole beside the USB connector, under the rubber flap on the bottom of the transmitter. The Atmel ARM chip will be reset to factory defaults.

Caution: Pressing the Erase Button completely wipes the firmware off the chip; it does NOT restore the transmitter to original firmware.

Updating Firmware

- Download the firmware file to the desktop or a folder where you can find it later. Unzip the file if necessary. The firmware will be in a file such as *ersky9xr_rom.bin*.
- Connect the transmitter to the same USB port on your computer that was used to install SAM-BA. Turn it on. The radio should display 'USB' on the screen and the computer will make the 'successful connection' sound.

- Start SAM-BA from the shortcut on the desktop. You will see the SAM-BA dialogue box.
- Click 'Connect'. Windows may take up to a minute to connect.
- You should see:



- Use the browse button next to the "Send File Name" Box to locate and select the new firmware file on your computer.
- Click the "Send File" button. You should see the file upload in the dialog box at the bottom – the process should only take a couple of seconds to complete.
- After the programming is finished, you will see an option to 'lock' the firmware. **DO NOT LOCK THE FIRMWARE! Select the "No" button.**¹
- Quit SAM-BA, turn the radio off, and disconnect the transmitter from the USB port.
- Turn on the transmitter and check its operation with the new firmware.
- You should now be able to use the built in bootloader capability of the firmware to connect the transmitter to the computer via USB. Turn off the transmitter and turn on again while holding the two horizontal trim levers towards the centre. Plug in the USB cable and the transmitter should be connected. See for details, see:

[link to [9XR Pro: Connecting to a Computer](#)]

NOTE: SAM-BA only works once each time it is started. After each use you must quit SAM-BA, turn off the radio, and disconnect the transmitter from the USB port. Only then can you reconnect and upload or download a file.

¹ If you do accidentally press "Yes" and lock the firmware, it will be necessary to erase the chip and reload the firmware, as detailed above. A locked transmitter will still work but you won't be able to update firmware.