9XR Pro: Communicating with a Computer

Introduction

The Turnigy 9XR Pro transmitter uses **ersky9x** open source firmware and a Micro-SD card to make exchanging programs and data with a computer easy and convenient.

This manual explains how to use the computer to keep the 9XR Pro firmware up to date and to copy new voice and other files to the transmitter. It shows how models can be programmed and stored using the **eepskye** desktop program. Finally it provides information on what to do if the transmitter encounters problems and needs to have the firmware replaced.

Communication between Transmitter and Computer

Two methods are available for transferring files:

1. **Micro-SD card**: Involves physically moving a storage card between the transmitter and the computer to transfer files in either direction. This method can be used with virtually any operating system, including Windows, Macintosh and Linux.
2. **USB cable**: Uses a direct USB connection to enable the computer and the transmitter to “talk” to one another.

Method 1: Micro-SD Card (any computer)

The ability of the 9XR Pro transmitter to read from and write to a Micro-SD card allows files to be directly transferred in either direction between the transmitter and the computer.

The Micro-SD card holder is located under the rubber flap on the bottom of the transmitter. The card slot is located between the mini-USB connector and the audio jack, as shown below. Insert the card into the slot with contacts facing up and make sure it latches into place.

Your new 9XR Pro may come with a card already installed containing files such as firmware, voice clips, manuals, etc. It's a good idea to make a backup of the contents of this card on your computer.

The transmitter can also save individual model setting files to the Micro-SD card using the Backup command in the Model Select screen. These can be copied to the computer for storage and can be edited there, as explained in the manual *9XR Pro: Using the Eepskye Program*.

To remove the Micro-SD card, make sure the transmitter is OFF and open the rubber flap. The card is latched into its holder and must be pressed in momentarily to make it pop out.

Using the Micro-SD card with the computer generally requires that it be inserted into an adapter that fits either a regular SD card reader slot or a USB port. Make sure the adapter is unlocked if you need to write to the card (slide the switch on the adapter away from the 'lock' position).

When the card is inserted into a Windows computer, Auto Play should offer 'Open folder to view files.' If not, go to 'Computer' and find the drive. On a Mac the disk image will automatically appear on the desktop; double click to open it.

Use the computer in the normal way to read or write to the card as required.

To remove the card from the computer, use "Safely Remove Hardware and Eject Media" on a Windows machine. On a Mac, move the disc image to Trash.

Make sure the transmitter is OFF when you reinsert the card.

Method 2: USB Cable

You will need a USB cable with a standard connector for the computer at one end and a Mini-B connector to fit the transmitter at the other (picture above shows the transmitter socket). Such cables are used by many older smartphones (but note that some phone cables are only for charging and do not allow communication).

To set up a USB connection, start with the transmitter turned OFF.

Hold both horizontal trim switches (Aileron and Rudder) TOWARDS THE CENTER and turn ON the transmitter. You will see "Boot Loader Ready" on the transmitter screen and the names of any firmware files that are in the 'Firmware' folder of the Micro-SD card.

If you are using a Macintosh, you may wish to turn off USB access to the Micro-SD card, as loading is often very slow (five minutes or more). Simply press the TRN switch once and a message will repeatedly flash on the screen saying "SD card Off". To turn access back on, simply press the TRN switch again.

Now plug the USB cable into the transmitter and the computer. Press the connector firmly into the transmitter connector and make sure it is fully seated. You should soon see the computer recognize the USB connection and hear the "successful connection" sound.

You will now see "Connecting..." on the transmitter screen, indicating that it is connected to the computer.

On the computer, you will see two new drives.

- ERSK_9X represents the EEPROM memory on the transmitter's main circuit board (where the model programming and radio firmware is stored).
- The other new drive is the removable Micro-SD card in the transmitter. If you turned off access, the drive will not show

Note that the letters associated with these drives will depend on the configuration of your computer.

To disconnect the transmitter from a Windows PC, first use “Safely Remove Hardware and Eject Media” to eject SKY9X. Then turn OFF the transmitter and unplug the cable.

For a Macintosh, eject the disk image from the desktop.

Flashing New Firmware

Updating the **ersk9x** firmware requires downloading a file and copying the new firmware to the transmitter’s Micro-SD card. The boot loader built into the existing firmware can then be used to ‘flash’ the transmitter memory to the new version.

Note that the **eepskye program** (described below) can also be used to update the firmware.

Loading New Firmware onto the Card

The latest version of **ersky9x** can be found at:
http://ersky9x.googlecode.com/svn/trunk/ersky9xr_rom.bin

Download the file to the desktop or other convenient location and unzip if necessary.

Copy this file to the ‘Firmware’ folder on the Micro-SD card. This can be done by either of the methods explained above. Briefly:

1. Copy direct to the card (PC or Macintosh)

Make sure the transmitter is OFF. Remove the Micro-SD card, insert it into the adapter and plug it into the computer.

Copy the new firmware file into the Firmware folder on the Micro-SD card.

On a PC use “Safely Remove Hardware and Eject Media”. On a Mac eject the disk image by moving it to the 'Trash'. Physically remove the card.

Insert the Micro-SD card into the 9XR Pro, contacts facing up. Make sure it clicks into place.

To enter boot mode, hold the horizontal trim switches (Aileron and Rudder) towards the center and turn ON the transmitter. “Boot Loader Ready” appears on the transmitter.

2. Use a USB connection to copy the file

Windows or Linux Computer

Start with the transmitter OFF. Hold both horizontal trim switches (Aileron and Rudder) towards the center and turn ON the transmitter. “Boot Loader Ready” appears on the transmitter.

Plug the Mini B USB connector firmly into the transmitter connector and make sure it is fully seated. Plug the regular USB connector into the computer. You will see “Connecting..” on the transmitter screen.

On the computer, find the ERSKY drive representing the Micro-SD card.

Copy the new firmware file to the ‘Firmware’ folder.

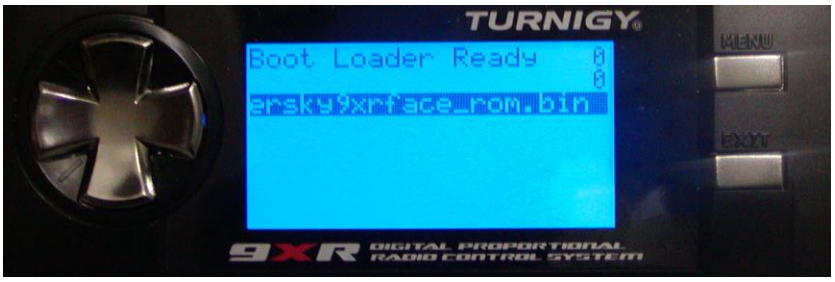
Use ‘Safely Remove Hardware and Eject Media’ to eject SKY9X. Unplug the USB cable. Don’t turn off the transmitter.

Mackintosh Computer

Because the disk image of the SD card takes a very long time (minutes) to mount on a Macintosh, it is recommended that you use the direct copy method above.

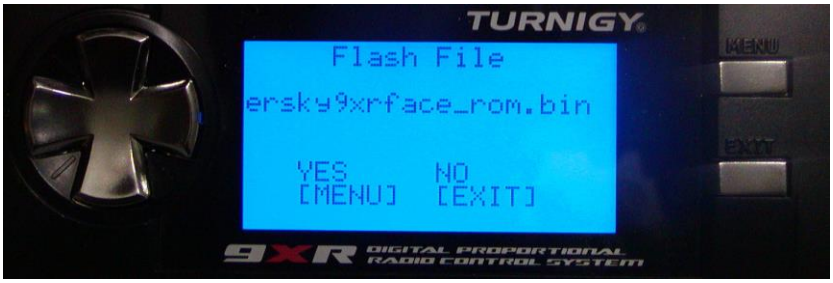
Installing the Firmware

After completing one of the options listed above to copy the new firmware to the Micro-SD card, the transmitter should be running with the following screen displayed.



With the desired file highlighted, long press MENU (i.e., hold the button for about half a second).

You will get a confirmation screen offering: MENU to flash, EXIT to cancel.



Long press MENU. The new firmware will be flashed to the transmitter, with a progress bar shown. Wait until you see “Flashing complete” in a few seconds. Turn OFF the transmitter.

Turn the transmitter back ON and verify that the new firmware is working correctly.

Connecting to the Eepskye Program

The 9XP Pro can also work with the eepskye program to allow models to be programmed on-screen and model definitions to be backed up to the computer and retrieved when needed. Eepskye can also be used to update the transmitter’s firmware. Eepskye currently runs on Windows, Macintosh and Linux computers.

See the manual *Using Eepskye with 9XR Pro* for details on how to install and use the program.

Updating the Boot Loader

The boot loader is a separate program residing in the EEPROM memory that makes it possible for new firmware to be flashed from the Micro SD card to the transmitter.

The boot loader program is included in the firmware file but requires that a special procedure be used for loading it. This should rarely need to be done and specific instructions will be issued if it is required. But in case you do need to update the boot loader, here’s how the process works.

First, follow either of the methods explained above to download the new firmware and copy the file (*ersky9xr_rom.bin*) to the ‘Firmware’ folder of the transmitter’s MicroSD card.

To update the boot loader, start with the transmitter OFF and not connected to the computer. The transmitter must now be put into ‘Maintenance Mode’. Hold both horizontal trim switches (Aileron and Rudder) AWAY from each other and turn ON the transmitter.

You will see “MAINTENANCE – Update Boot Loader” on the screen. Long press MENU and the new firmware file will be shown on-screen. Select it and long press MENU. Long press MENU again to confirm “Update boot.” You will see “Flashing” then “Flashing Complete”. Long press EXIT. The new version of boot loader is installed.

Restoring a “Bricked” Transmitter with SAM-BA

Occasionally a problem may occur with the firmware that causes the transmitter to stop working. To correct this situation, it is necessary to erase and re flash the main processor chip with fresh firmware.

Re-flashing the Atmel chip requires the use of a separate program, SAM-BA; it cannot be done by the methods explained earlier in this document, as the bare chip does not have the capability to flash firmware. Note that SAM-BA only runs on a PC.

The “unbricking” process using SAM-BA is described in a separate document, available at: http://openrcforums.com/forum/viewforum.php?f=70

Here is an outline of the two steps in the process:

Step 1: Erase the chip

While turning ON the transmitter, use a paperclip or similar to press and hold the small round Erase Button beside the USB connector, under the rubber flap on the bottom of the transmitter. As the transmitter powers up, the Atmel ARM processor 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.

The EEPROM model memory is a separate chip and is not erased when the Atmel processor chip is erased.

Step 2: Re-flash the chip with new firmware using SAM-BA

To do this, you need to install, on a personal computer running Windows, the SAM-BA program from Atmel, the maker of the transmitter’s ARM chip. Once installed, SAM-BA communicates with the transmitter via a USB cable and can be instructed to re-flash the ARM chip. The firmware then gives the transmitter the ability to load updated firmware from the SD card without further use of SAM-BA.

Further Information

For additional information to help you understand and make best use of your Turnigy 9XR Pro, see the other manuals in this series and/or go to one of the forums dedicated to this transmitter and the open source firmware it uses.

9XR Pro Manuals

The following manuals are designed to help you get the most out of your Turnigy 9XR Pro. They are available at: http://openrcforums.com/forum/viewforum.php?f=7

1. 9XR Pro: Introduction to the Hardware
2. 9XR Pro: First Steps with Ersky9x
3. 9XR Pro: Ersky9x Explained
4. 9XR Pro: Communicating with a Computer
5. 9XR Pro: Using Voice with Ersky9x
6. 9XR Pro: Using the Eepskye Program
7. 9XR Pro: Glossary of Terms

Internet Forums

Help is always just a few clicks away on the internet forums where experienced Ersky9x users volunteer their knowledge and experience. Many of these people have been developing the firmware for years without remuneration; all they ask is donations to fund further development.

Open RC Forums: http://openrcforums.com/forum/index.php

Ersky9x index page: http://openrcforums.com/forum/

9XR index page: http://openrcforums.com/forum/viewforum.php?f=70

9XR Pro Communicating with computer 2014-04-25