

H0420

Programmable MP3-player for scale models, broadcast systems and special applications

Firmware Update: Version 1.9 Build 4299

[For upgrading to the new firmware, please see page 3 for the procedure.](#)

This document describes the changes that version 1.9 of the firmware (build 4299) brings to the previous release (version 1.8, build 4110). For changes in earlier revisions, see the relevant documents that are available on the web site <http://www.compuphase.com>.

New basic functionality & modifications

1. Improved support for graphical LCDs with the KS0107/KS0108 controller

Some LCDs with the KS0107/KS0108 controller (or compatibles) have “chip select” lines that are active low, and others that are active high. This can now be selected with function `consctrl()`.

2. Function `setvolume()` can now fade in and out

The function `setvolume()` has a third parameter that allows you to set a time for the volume (or balance) adjustment to complete. This time is in milliseconds, if you set the new volume to -20 relative to the current volume and the time to 2500, the H0420 will fade out with 20 dB in 2.5 seconds. In contrast the the “volume fade duration” parameters of the functions `play()` and `stop()`, function `setvolume()` adjust the volume asynchronously (meaning that the script can perform different operations while the volume fading is performed in the background).

3. New function `fmkdir()` to create directories

The new function `fmkdir()` creates a new (empty) directory. Directories can be removed using the (existing) function `remove()`.

4. New function `fcopy()` to copy a file

Similarly to function `rename()` to rename files, new function `fcopy()` copies a complete file under a new name or to a different directory.

5. Corrections in file system support

Deleting a file in a particular location in the directory could cause another file in that same directory to become inaccessible. The same occurred with renaming of files. These problems have been corrected.

6. No “greeting” on the RS232 port on start-up

In previous releases, if no CompactFlash card was detected in the H0420, it sent out a string with the device number and firmware version. In the new firmware, the H0420 board only does so, after the “BOOT” switch is pressed (see page 5). In other words, the H0420 does no longer access the RS232 port when the CompactFlash is ejected. To force a notification of the card eject event, use the `@eject()` public function.

7. Firmware update loader, for network updates

To update firmware from a remote location, for example via the network (if a network extension is present), this release of the firmware comes with an additional module (in the firmware) that can read future updates of the firmware from the memory card and store them into the Flash ROM of the H0420. In other words, in the future, it is only necessary to store the firmware file on the memory card and reset the H0420 board to update the firmware.

8. PAWN scripting language & tools

The compiler and toolkit have been improved in various areas. The Quincy IDE has improved brace matching (speed) for large files, and support for FTDI virtual COM ports (for remote debugging). The FileLink utility now supports more Baud rates.

New functionality & modifications for the network extension

9. Improvements in the support for DNS

Some DNS servers do not function well with reply ports in the low range. The network extension now always selects a high port number for DNS replies.

10.Improvements in SNMP support

The SNMP “agent” in the firmware is now more compatible with various clients and SNMP “monitors”. For SNMP walking, the agent now also supports “0.0” as the root starting address. SNMP requests are accepted in versions 1 and 2 (but replies are always in version 1).

11.Quicker HTTP streaming

By using larger buffers and improved throughput algorithms, the HTTP streaming is improved. The effect is especially noticeable on slow CompactFlash cards.

12.New native function `netctrl()`

The new function `netctrl()` allows for low-level configuration of the network interface. It has sub-codes to optionally force a “safe” TCP/IP MSS of 512 bytes, rather than the default, and to switch the network interface between half-duplex and full-duplex. On start-up (or after reset), the network interface defaults to half-duplex.

13.New code for native function `netinfo()`

The function `netinfo()` now also returns the number of Tx/Rx errors since last call to this function. If this is a high number, this may indicate a cabling problem, or a mismatch on the network of half-duplex and full-duplex devices.

14.General improvements in networking

The MTU has been reduced from 1500 to 1454 because the earlier default would cause fragmentation for some implementations of DSL/ADSL.

Upgrading the Firmware

When upgrading firmware, the scripts in the PAWN language should also be recompiled with the latest release of the PAWN compiler. Any “**amx**” file built for earlier versions of the firmware may not function accurately with the new firmware. The new release of the PAWN toolkit is included in each firmware update.

The procedure below describes how to upgrade the firmware using a PC running Microsoft Windows. When you do not run Microsoft Windows, please contact us for an alternative upgrade procedure.

We advise you to read through this procedure before starting the upgrade, so that you have a mental picture of the steps that are involved in the procedure.

1. Install the software

If you have not done so already, download the firmware update and then “open” or “run” the file. The firmware update file is a *setup* program that installs the required components. If you received the firmware update on CD-ROM, you can install it directly from the CD-ROM.

2. Connect the H0420 to a PC & remove the CompactFlash card

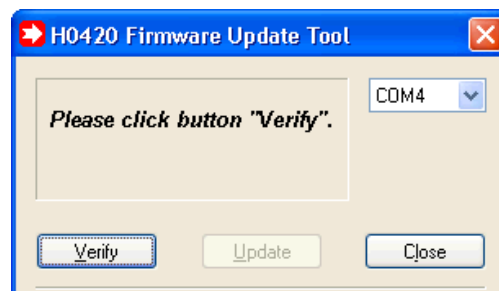
First unplug the H0420 MP3 player from the 5V power. Then remove the CompactFlash card from the H0420, and connect a standard RS232 cable (not a null-modem cable) between a PC and the H0420. Plug the power connector back into the H0420 once the serial cable is connected. Do not re-insert the CompactFlash card (this is done in step 5).

If you are using a simulated RS232 port (for example, through an USB-to-RS232 adapter), it is best to wait a few seconds between inserting the RS232 plug and the power plug —10 seconds should always be sufficient. Note that “simulated RS232” is less reliable than hardware RS232; if you have a choice, we advise you to use a real RS232 port for the firmware update.

If the device was already connected to the PC through the RS232 cable and the CompactFlash card had already been removed, it is still advised to remove the power plug for a few seconds, so that the device does a full restart.

3. Run the “Firmware Update Tool”

Locate the “Firmware Update Tool” in the *Start Menu* (under *Programs / H0420 MP3 Controller*), and run it —this tool was installed in step 1. See the screen shot below for the appearance of the Firmware Update Tool.

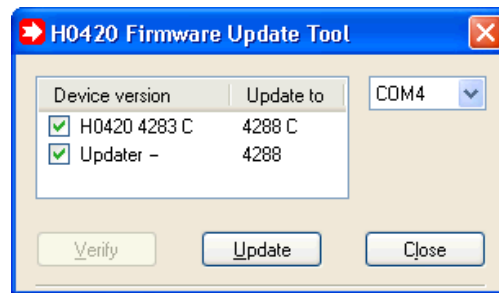


Make sure that the correct COM port (RS232) is selected in the update tool.

4. First click “Verify”, then click “Update”

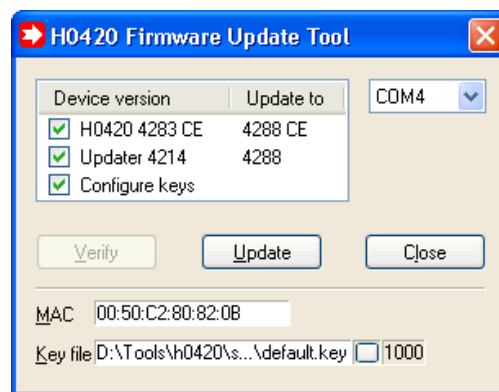
Click on the button “Verify” and allow it to complete. This function checks the current firmware version and the device model and reports these to you. If the Firmware Update Tool tells you that it cannot connect, or synchronize to the H0420 device, please verify that the cabling is correct and that you have selected the correct COM port.

If “Verify” completed successfully, it will present you with a list of firmware components that has found in the device and what updates are available. There may be 1,2 or 3 items in the list. If the Firmware Update Tool proposes that a component must be updated, it has placed a check-mark on the row; if the Firmware Update Tool detects that the device already has an up-to-date component, it will remove the check-mark from the row. You can overrule the proposed updates by toggling the check-marks prior to clicking “Update”.



The revision/build numbers in the screen shots may differ from the ones that you are seeing. For example, the “Update to” value for the H0420 firmware will be 4299 for the current firmware release.

If you have a custom key file (for encrypted MP3 tracks or encrypted CompactFlash cards), or if you have an Ethernet extension board for the H0420, the Firmware Update Tool shows up to two additional rows with entry fields: one for the MAC address and one for a key file. You may need to adjust the MAC address, with one that was provided with the network extension board.



If the “Verify” button found no error, you can click on the button “Update”. Updating the firmware may take several minutes. Do not abort the program while the firmware update is processing. The update process may involve several steps. The Firmware Update Tool will inform you about its progress.

After the update has completed, the program will inform you that the device will automatically reset itself after a time-out of a few seconds. If you wish to check that the firmware has indeed been uploaded correctly, you will have to wait until that message box disappears before clicking on the button “Verify” again.

5. Recompile the PAWN script

Although any existing script on the CompactFlash card will still run, it is advised to recompile the source code of the script with the updated PAWN compiler. After compiling the script and storing the resulting file AUTORUN.AMX on the CompactFlash card, you can now re-insert the CompactFlash card in the H0420 player.

Trouble shooting — when uploading fails

If the “Verify” button times out and responds with the error message:

**Unable to synchronize with the device.
Please check the serial connection.**

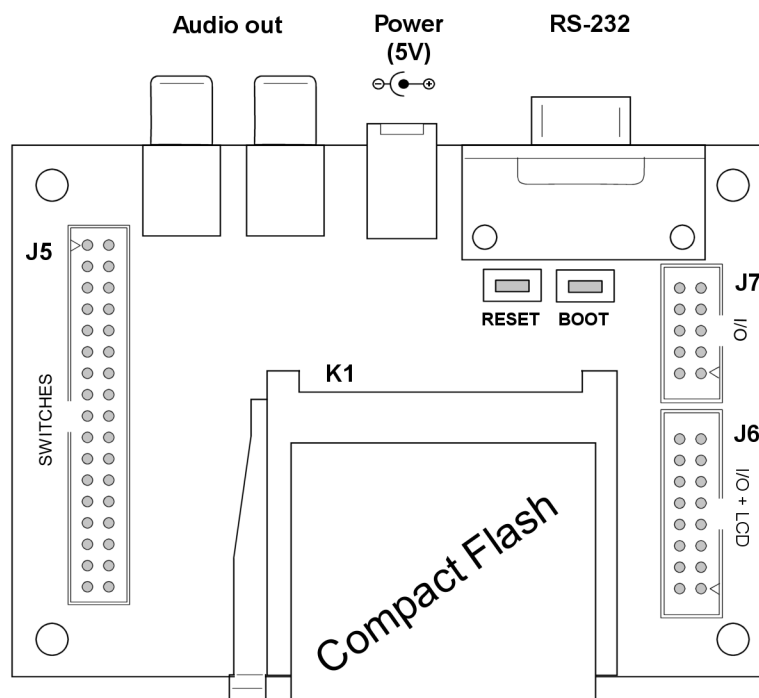
- check the RS232 cabling
- “power cycle” the H0420 MP3 player (remove the power plug from the device for a few seconds and then re-insert it)
- run the update procedure (on the previous page) again.

If this fails again, try to reset the H0420 while the Update Tool is busy verifying the device. That is: click on the button “Verify” and then press the “**RESET**” switch on the H0420. See below for the location of the reset button. You may also want to try to perform the procedure after rebooting the PC, or from a different PC.

If all fails, a last option that you can try is to set the H0420 in “Boot Loader mode” (see below), and run the procedure again. In this case, the “Verify” button will inform you that it cannot find the “current” version of the firmware in the H0420, but it still allows you to update to the latest revision. Resetting the H0420 to Boot Loader mode is typically necessary when an earlier upload has been aborted or interrupted.

Resetting the H0420 to “Boot Loader mode”

The H0420 has two switches, behind the connector of the RS232. In order to gain access to these switches, it may be necessary that you open the case in which the H0420 is mounted.



These switches must be pressed and released in the correct order:

- Press (and hold) “**RESET**”
- Press (and hold) “**BOOT**”
- Release “**RESET**”
- Release “**BOOT**”

It is advised to “power cycle” the device before resetting it to boot loader mode, and to remove the CompactFlash card. (Do *not* power-cycle the device *after* switching it to boot loader mode, because this would reset the device to normal mode.)

When you click the “Verify” button in boot loader mode, the Firmware Update tool will say that it cannot detect the version of the firmware that is already in the H0420. This is a limitation of boot loader mode. You can ignore this message and click on the “Update” button.