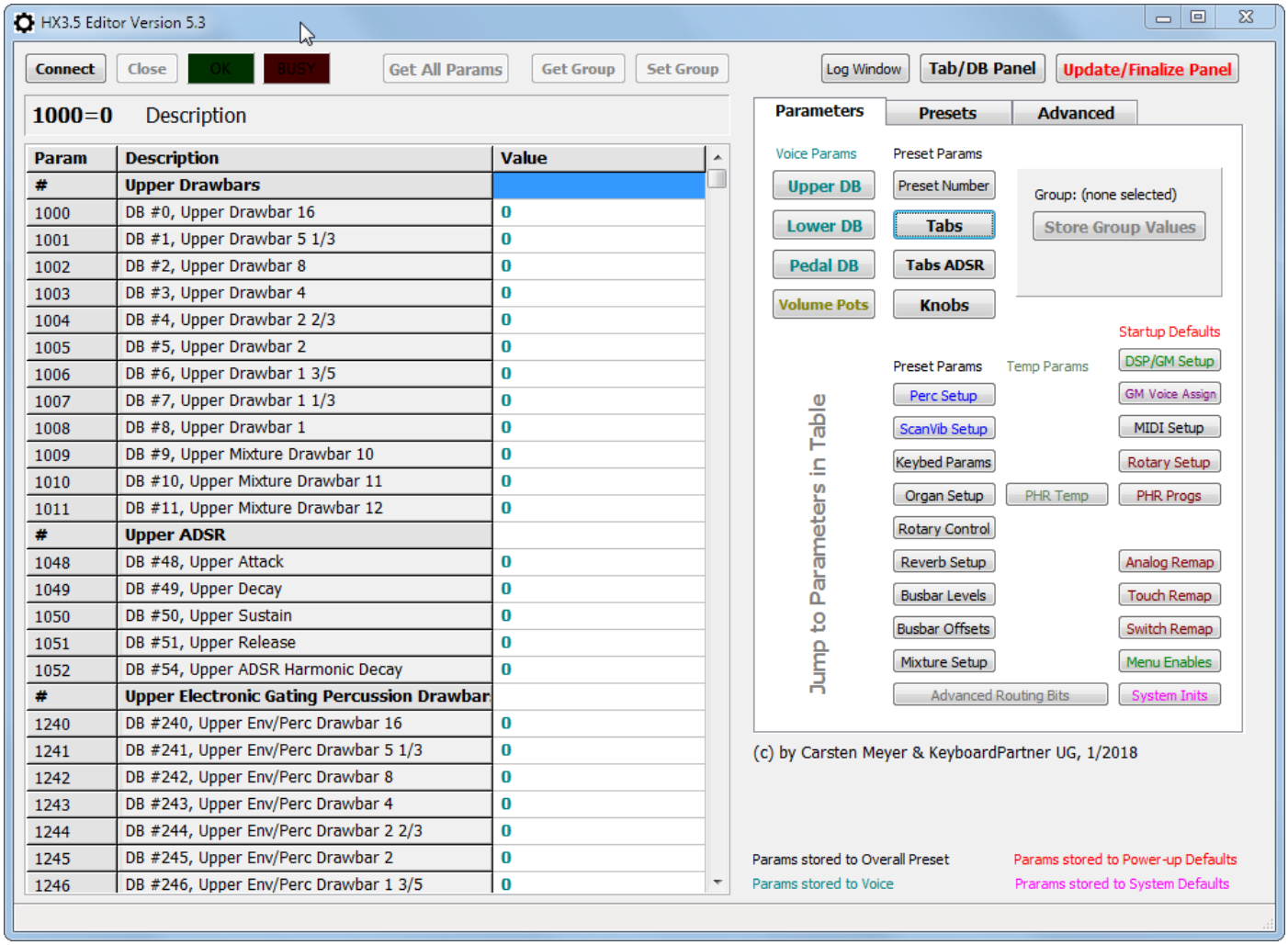
KEYBOARDPARTNER UG

HX3.5 Editor (Version 5.2)



HX3.5 Editor is a powerful tool for operating the HX3.5. By means of the HX3.5 Editor you may set up the HX3.5 for any possible hardware configuration, trigger firmware updates, adjust sounds and effects, pre-assign General MIDI instruments for the live selection, set all operating parameters and recall presets live through function keys on your computer keyboard.

At the same time, HX3.5 Editor is KeyboardPartner's production tool; it does enable you as well to adjust your HX3.5 in a way that renders it completely useless for your configuration. Please use the Editor with due diligence; do not adjust parameters without knowing what they mean.

HX3.5 Editor is a Windows application. You need not install it though. Just make sure all files contained in HX3.5 Editor ZIP file are copied to a folder on your local harddisk. All files must be present in the same folder as the HX3.5 application.

Mac users, please see section **Using HX3.5 Editor on a Mac** below.

The editor for old HX3 versions *HX3.4 Remote* is **not** suitable for the HX3.5. Vice versa the HX3.5 Editor cannot handle older HX3 hardware versions.

Connection

HX3.5 Editor can connect to the HX3.5 mainboard through several channels:

- through **MIDI over USB** using a USB connection from your PC to the B-type USB Jack of the HX3.5 mainboard or of the HX3 Extension Board mk5 (but not mk4) or to the USB-mini Jack of the HX3 MIDI Expander,
- through a bi-directional **MIDI connection (IN/OUT)** using a third-party USB MIDI adaptor,
- through our **FTDI serial adaptor cable FT232R-5V** (available at our shop). Attach USB-to-serial adaptor cable FT232R-5V to the PC USB port and HX3.5 6-pin header PL19, black wire (BK) facing to black header PL17,
- through any **FTDI device** with FT232 interface chip like the one on our discontinued HX3 Extension Board mk4. Connect the USB cable to the B-type USB jack of the HX3 Extension Board mk4 (internally, this as well goes as USB to serial connection through a FTDI interface).

Choose the channel that fits your configuration best. In the editor application all channels are equal, except for DSP updates, which can be made through MIDI over USB only.

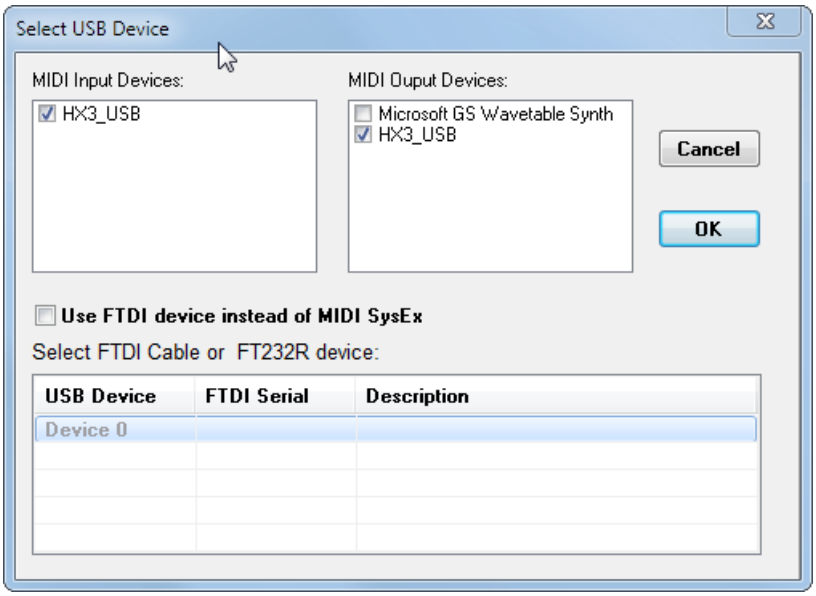
Important: When using a "MIDI over USB" connection, disconnect any MIDI device from secondary (left) MIDI input DIN jack as both share the same MIDI input line.

Starting up

Starting up the HX3.5 Editor will open the main editor window and a small log window that logs actions. The large table on the left side of the main window lists all 800+ HX3.5 parameters. On the right you see several buttons placed under the indices *Parameters*, *Presets* und *Advanced*. The HX3.5 parameters are organized in groups. To find a particular parameter group, click on the index *Parameters*, then click on the corresponding button. The group will move to the top of the table, and will be marked as active by green parameter numbers.

Some buttons are greyed out and not usable. Select index *Advanced* und check „**Advanced Mode**“ to activate all buttons.

Click on *Connect* on top of the main window to connect the HX3.5 to the HX3.5 Editor. This will open a window listing the MIDI Input/Output devices.

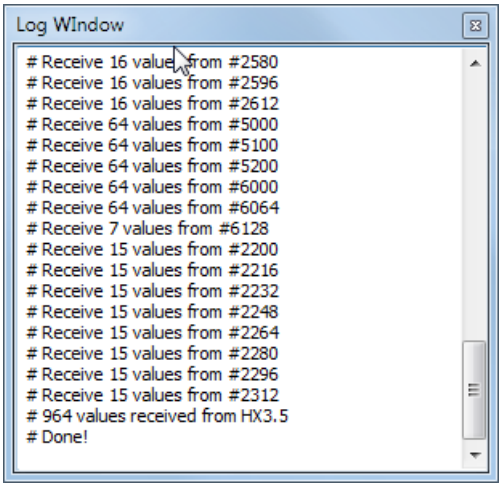


MIDI Connection

If the HX3.5 is connected to your PCs USB port, it shows up on the list as „HX3_USB“ or similar. These entries are selected by default, so the communication will take place through MIDI over USB. Select „USB Midi Cable“ to connect through a USB MIDI interface and MIDI IN/OUT. Protocol is proprietary SysEx, so other devices will not respond to HX3.5 Editor commands.

FTDI cable connection

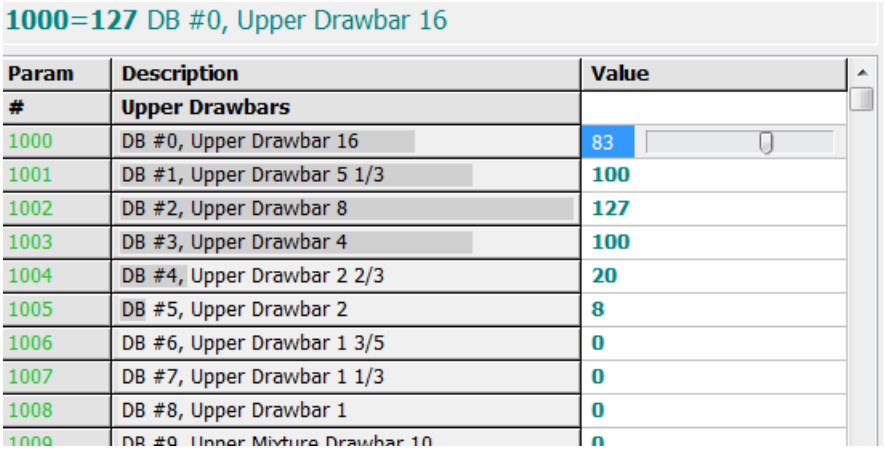
On *Connect* in the editor main window, check the *Use FTDI device instead of MIDI* box. Select "FT232R", "TTL232R", or similar entry. On first use, Windows will install FTDI drivers automatically. Windows XP may require manual FTDI driver installation, though. Please find the „FTDI_Driver_XP“ in the editor directory.



Close the Input/Ouput devices window by clicking on *OK*. Once the connection is established the HX3.5 Editor will fetch all parameter values of the HX3.5 and update the parameter table. Communication is being logged in the log window.

Parameter editing

In the column *Value* click on the parameter line you want to edit.



Important: Please do not change values you don't fully understand! In particular, the System Inits and Rotary Setup group are delicate to changes, which may lead to unwanted results.

A **help text** for the selected parameter appears on the right at the bottom of the main window. Depending on type of parameter, either an editable scroll bar, an ON/OFF button or a dropdown list appears on parameter line. Some parameters do not have a special visual control, just the number itself. Below the parameter table a help text is displayed explaining the current action.

Click on the teal colored *Get Group* button above to refresh values from HX3.5 board (for example current drawbar settings after moving drawbars at the device). *Set Group* will send all group values to the HX3.5 (usually not necessary since parameter uplink is always "live"). The values sent by *Set Group* are not stored permanently though.

Storing parameter values

Changes to parameters values are executed instantly, but they are temporary until you save their parameter group. Save destination is dependant on type of parameter (see color coding at right bottom of main window).

In the main window, click on the tab *Parameters* and select a parameter group by clicking on the group button, or click on a parameters value in the table to activate that group for saving.

For example: To save teal colored **Voice** settings (drawbar positions) in the main window to a particular **Voice**, choose index *Parameter*s select the desired voice number from the dropdown list and click on *Store Group Values* button.

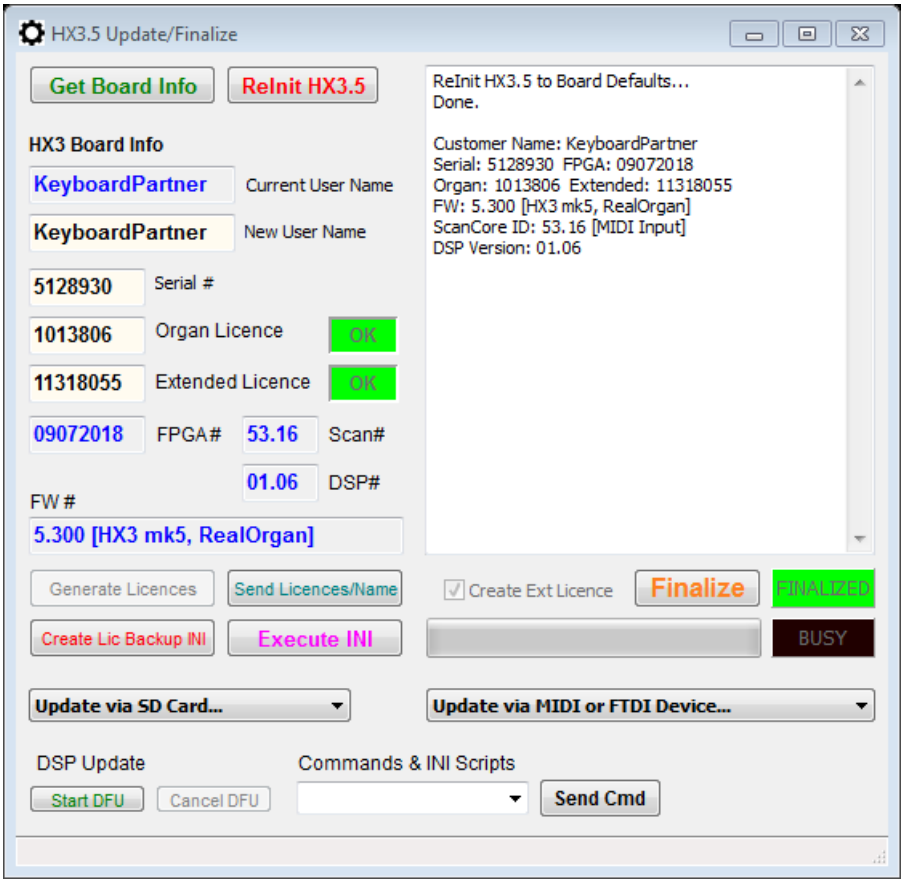
The black colored parameter values are saved to overall (common) presets. Note that the *Store Group Values* button changes its color corresponding to the type of the activated parameter values.

Red colored parameter values are initial default values, which are valid for all voices and presets. Click on *Store Group Values* to save them as initial default values. These initial default values may get lost in the course of major firmware upgrades. Therefore you should create a backup file before updating. See section **Backup**.

Pink colored parameter values (System Inits) are saved as a startup defaults for all voices and presets as well. Click on red *Store Group Values* button to save as initialization values. These parameters are persistent even with a major firmware update. Examine the values thoroughly, if your hardware configuration has been changed. Also check the values on first-time use of brand new mainboard which is configured as MIDI expander from factory.

Grayed-out parameters should not be changed.

Basic Settings



Open **HX3.5 Update/Finalize** window by clicking on the button *Update/Finalize Panel* at the top right corner. In the text field, the "Board Info" should show current configuration, including user name, the HX3.5 serial number, the "Organ" and "Extended" licence keys as well as the version numbers of the active parts of the operating software. Complete or partly updates may be triggered by pull-down menus in this window (see below).

Checklist:

- Is at least **Organ Licence** OK "LED" lit (light green)? Otherwise, licence number is invalid or a communication error occured reading it. You may need to enter the valid licence number(s) again in the finalize window. Then click on 'Send Licences/Name'.
- Is the appropiate **Scan Driver** installed? Should be either MIDI Input for HX3 MIDI Expander or HX3 Drawbar Expander FW) or FatarScan driver for other firmwares. You may replace the Scan Driver by using the HX3.5 Editor (see below).
- Are HX3.5 **System Inits** correct? HX3.5 will not scan buttons or analog inputs if not set correctly. Go to HX3.5 main window and click on pink *System Inits* button. See **Editing Parameters** section below how to do this.

In order to configure the board for a particular device click on *Execute INI* and then open the file "config_xxx.ini" (xxx = device name). HX3.5 boards are configured as MIDI Expander from factory.

In order to restore **factory default settings** click on *Execute INI* and then open the file "factory_xxx.ini" (xxx = device name). Execution may take several seconds. To restore all presets to factory default settings, click on *Finalize*. Confirm you want all presets to be overwritten by clicking on *Yes*.

Backup

Before performing an update you should create backup files of the configuration settings and your presets.

- To save the **licence information** click on *Create Lic Backup INI* in the window **HX3.5 Update/Finalize**. This will create a file named "licence.ini" containing your licence information.

In case the licence information is lost after a backup click on *Execute INI* and open the file "licence.ini". This will restore the licence information. Click on *Get Board Info* to confirm.

- To save the **configuration settings** click on the tab *Advanced* in the main editor window, then on *Save Table to INI Setup*. The will create an INI file containing all configuration settings except the presets. Select a unique name for the INI file. The factory default settings are stored in this way in the file "factory_xxx.ini".

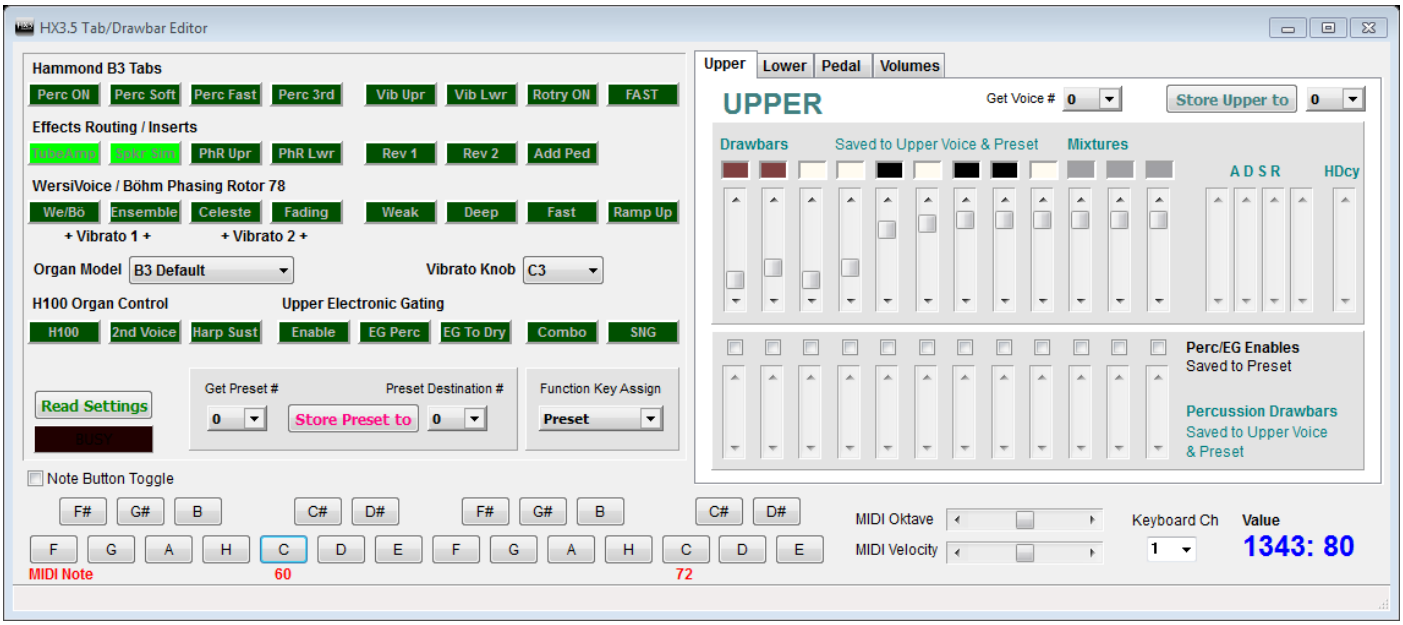
In case your configuration settings are lost after an update, click on *Execute INI* in the main window or in the Update/Finalize window and open the INI file you have created. Click on *Get All Params*, then your configuration data should appear again in the main window table.

- To save the **Presets** click on the tab *Presets* in the main window, then click on *Save Preset(s)*. This will create an INI file containing all (ALL) presets or a selected presets (number). If you choose ALL the procedure may take several seconds. Choose a unique file name like "presets_new.ini".
- To save the **Voices** (drawbar settings) click on the tab *Presets* in the main window, and then on *Save Upper Voice(s)*. This will create an INI file containing all (ALL) voices or a selected voice (number). Saving the Lower or Pedal voices is done in the same mannor using the buttons *Save Lower Voice(s)* and *Save Pedal Voice(s)*, respectively". Choose unique names, for example "upper_all.ini".

In case your voices are lost after an update, click on *Execute INI* in the window HX3.5 Update/Finalize and open the INI file you have created. Repeat the procedure for the manuals and the pedal.

By the way: All INI files (the backup files as well) may also be read from an SD card and may be selected via the menu panel. Please note that in the menu all filenames are restricted by DOS convention (8 characters for the name, 3 characters for the extension). Experienced users may edit the INI files by using a standard text editor, for example to create or modify settings.

Operating the organ



In the main editor window click on the button *Tab/DB Panel* at the top. This will open a window containing **virtual controls**, which are more neatly arranged than in the main window table. On the "Tab/DB Panel" you have the instrument's operating controls only. By clicking on the tabs *Upper*, *Lower*, *Pedal* or *Volumes* you approach the operating controls of the respective manual like the drawbars and ADSR/Percussion enable switches, or the volume controls. In each section you may recall and save the respective Voice presets.

If you select a voice number in the range of 16...39 you will get a list box containing all available **General MIDI instruments**, from which you may pick your selection for the respective voice preset. Please note that the GM assignments are valid for upper and lower manual as well as the pedal at the same time.

Changes applied to the controls will be sent to the HX3.5 immediately and registered in the main editor table. Parameter assignment does not depend on the selected CC set, since the data are transferred via MIDI SysEx.

If the HX3.5 is connected through MIDI, you may play the sounds for trying out by touching the **virtual keyboard** with the mouse pointer..

Sometimes it may be useful to recall data from the HX3.5 board - for example after you have moved the real drawbars. Refresh the data by clicking on *Read Settings*. The settings on the "Tab/DB Panel" are synchronized automatically with the main editor table.

Presets on function keys

By hitting the *Esc key* or one of the *function keys 1...12* you may select the live preset 0 or preset 1...12 quickly on the PC keyboard. Keep the shift key pressed to have the parameter values fetched and displayed in the editor window. This will take some time, though, and is not recommend when playing on stage.

To select voices quickly, choose upper manual, lower manual, or pedal in the drop down menu "Function Key Assign" or by hitting one of the keys "u", "l", or "p". Push "c" or the spacebar to switch back to quick preset selection.

Firmware Updates and Scan Drivers

Update files are made available through our repository (github.com/keyboardpartner/HX35). Please download the "UPDATE" ZIP file according to your configuration. Unzip and copy all files to a local folder on your harddisk.

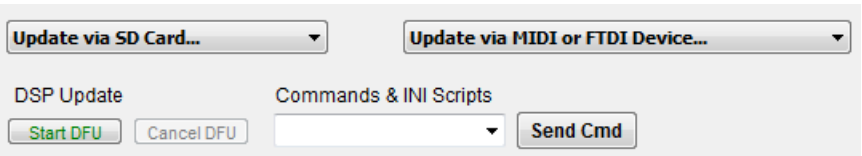
Besides MIDI over USB and FTDI connection update files may as well be provided on a SD or SDHC card. An appropiate SD card adaptor is available at our shop. Updates from SD card may as well be initiated in the panel menu or automatically on power-up. If you are using an SD card, please copy all files to the root directory of an empty card. Attach the SD card adaptor to HX3.5 mainboard PL17. For details please see guidance “HX3.5 SD Card Usage“ in our document library (http://wiki.keyboardpartner.de/index.php?title=HX3.5_Main_page).

Updates for HX3.5 consist of several parts:

- Controller Firmware including EEPROM content (firmware.bin and eeprom.bin), handles user interface behaviour and MIDI CC
- FPGA Sound Engine (hx3_main.bin), all organ sound generation
- Wavesets (wavesetX.bin), waveform definitions for Sound Engine, different organ models
- Scan Driver (scanXXX.dat), handles keybed scanning or MIDI receive
- Taperings (taperX.dat), B3/H100 tone generator filters and manual tapering definitions
- FIR coefficients (fir_coe.dat), coefficient file for rotary horn simulation
- DSP firmware (reverb, sound generation by GM synthesizer)
- DSP Sound Banks (audio wave table for GM synthesizer)

Files may be used independently and may carry different time stamps; some will rarely need an update (Wavesets, Taperings, FIR Coeffs). See Changelog on our Repository for details which files are to be updated since last commit.

Select the file designated for updating from the appropriate drop down menu *Update via SD Card...*, *Update via MIDI oder FTDI Device...* in the HX3.5 Update/Finalize Window.



Note: As long as the preset and parameter structure has not been changed in a new firmware version (otherwise will be noticed in Changelog), do not update the EEPROM content as it holds all board settings and drawbar voices. The update from SD card will skip the EEPROM update automatically if the preset structure has not changed.

Altering the configuration

After updating to a different firmware type (eg. from expander to drawbar organ), check **System Inits** parameters with HX35 Editor. These values are persistent even when firmware is updated.

Factory programming is ADC setting "Swell only" for expander use, so set the configuration according to your needs. Also, the “MIDI only” scan driver is installed. If FatarScan2 or Scan16/Scan61 boards are to be used, replace scan driver with appropriate type. On custom

Param	Description	Value
#	Board Inits (not saved in Preset)	
1496	2ndDB Select Voice Number	40
1497	Sync Voice Numbers with Overall Preset	255
1498	Save Preset Parameter Mask	20
1499	Button Mask 0	0
1500	Button Mask 1	0
1501	Linear Pots	255
1502	Linear Drawbars (not used)	255
1503	ADC Configuration	1
1504	Panel 16 Configuration	1
1505	Preset 16 Configuration	0
1506	Pedal Drawbar Configuration	1
1507	(not used)	255
1508	Binary Event Enable	0
1509	(Card Setup)	0
1510	(DFpresetStructureVersion)	16
1511	(Init Flag)	165

installations, also check Analog Remaps and Button Remaps with HX3.5 Editor as the update will install default values here.

Updating the firmware may require a "finalizing" process to overwrite invalid preset structures. In that case this will indicated in the changelog. Click *Finalize* button after all updates and settings are done. Note: Finalizing will void any presets, so please create a backup file before doing so.

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The preset structure has been changed from version 5.0xx to 5.105, but it remained unchanged since version 5.105; so there is no need to “**Finalize”**. Only updates from an older version do require the "firmware/eeprom" update followed by finalizing and initializing the presets. After updating by editor execute the "config.ini" appropriate for your hardware configuration. (Button "Execute INI" in Update/Finalize Window).

DSP Updates

While organ sound generation is done entirely in hardware (FPGA), the HX3.5 board uses an additional Digital Signal Processor (DSP) for reverb effects (EFX) and General MIDI voice generation. 128 GM sounds are installed as a so-called soundbank. Up to two soundbanks can be installed at a time. The second soundbank may contain additional, more elaborated instruments (carrying the same MIDI GM bank and program numbers), which replace the instruments in the first soundbank.

The DSP firmware and DSP soundbank(s) may be updated through the **USB connection only**. Connect the USB cable from your PC either to USB mini jack (internally connected to PL3) or HX3.5 B-type USB-Jack. Please note: The USB B-type connector on our discontinued HX3 Extension Board mk4 does not have direct access to the DSP chip and cannot be used for DSP updates.

The DSP update package consists of the following files:

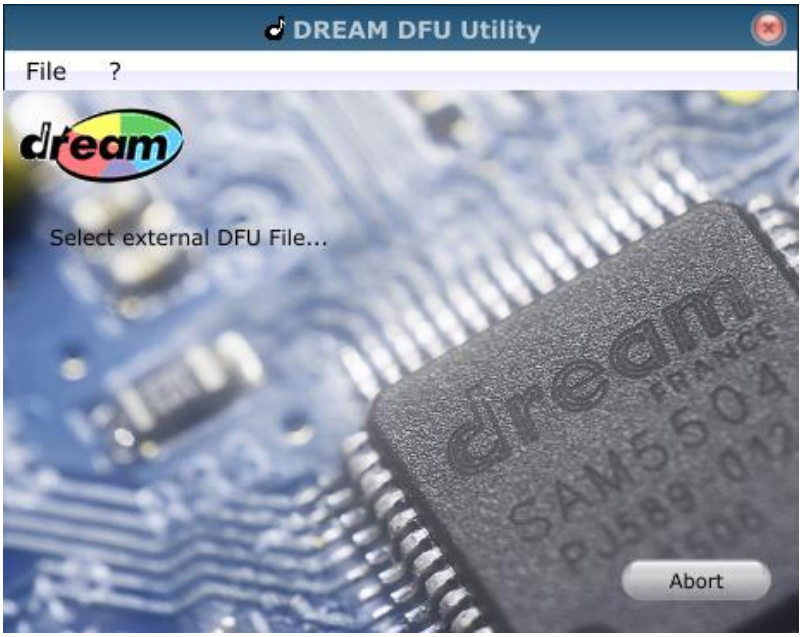
- DSP Updater (file DreamDfu.exe for Windows, update by USB connection)
- DSP firmware (file HX35_5504-FW_xxxx.dfu with Reverb and GM synth sound generation)
- DSP firmware (Datei *HX35_5504-FW_xxxx_noGM.dfu* with Reverb and longer reverb programs, but **without** GM synth sound generation
- DSP default sound bank (file GMBK5X64_0x8008.dfu, default GM soundbank for DSP GM synth)

plus, optionally

- DSP additional sound bank (file xxxx_0x8050.dfu, refined additional instruments for DSP GM synth)

The updater application "DreamDFU.exe" (Windows OS only) handles the DSP communication. It will be launched by HX3.5 Editor, if you click on *Start DFU* in the Update/Finalize Window.

The update package is contained in the editor directory. For Windows 7 and up, DFU mode does not need a driver. For Windows XP, the driver is contained in the editor directory: Please direct Windows driver installer to file "dream_dfu_device.inf" in directory "DFU_driver_XP" if Windows does request a driver path after clicking on *Start DFU*.



GM Sounds

The DSP reverb firmware *HX35_5504-FW_xxxx.dfu* combined with one or two GM sound banks includes all 128 sounds as specified by the GM2 standard. Which of the sounds appear as voices 16..39 is determined by the HX3.5 editor table "GM Voice Assignments" starting from parameter 2000.

Reverb programs

The DSP reverb firmware files *HX35_5504-FW_xxxx.dfu* and *HX35_5504-FW_xxxx_noGM.dfu* include the following reverb programs:

- 0: Off
- 1: Short Room
- 2: Room A
- 3: Room B
- 4: Small Hall A (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)
- 5: Small Hall B (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)
- 6: Large Hall A (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)
- 7: Large Hall B (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)
- 8: Short Plate (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)
- 9: Vocal Plate (only HX35_5504-FW_xxxx_noGM.dfu without GM-Sounds)

The reverb programs OFF, I (1), II (2) und I+II (3) may be adjusted by the editor parameters 1145 …1147.

Updating the DSP Firmware

To update the DSP firmware, proceed as follows:

- Attach USB cable to HX3.5. PC should recognize a USB MIDI device.

- Open HX3.5 Editor's Update/Finalize window and click on *Start DFU*. The connected PC will close the USB MIDI connection and recognize a DFU device instead.
- The updater app “DreamDFU.exe” will be launched and display a file select dialog. DreamDFU should show a window as shown in picture.
- Select DSP firmware file "HX35_5504-FW.dfu".
- The HX3.5 menu panel display shows “DSP Update (DFU)”.
- Click on *Update Device*. A progress bar will indicate the update progress, which takes only a few seconds.
- When finished, close DreamDFU by clicking on *Abort* or the Close button.
- HX3.5 will revert to MIDI over USB mode.
- Click on *Close* on top of the HX3.5 Editor window, then *Connect* to re-establish the MIDI over USB connection.

Sound Bank Installation

To update/install the GM2 soundbank, proceed as follows:

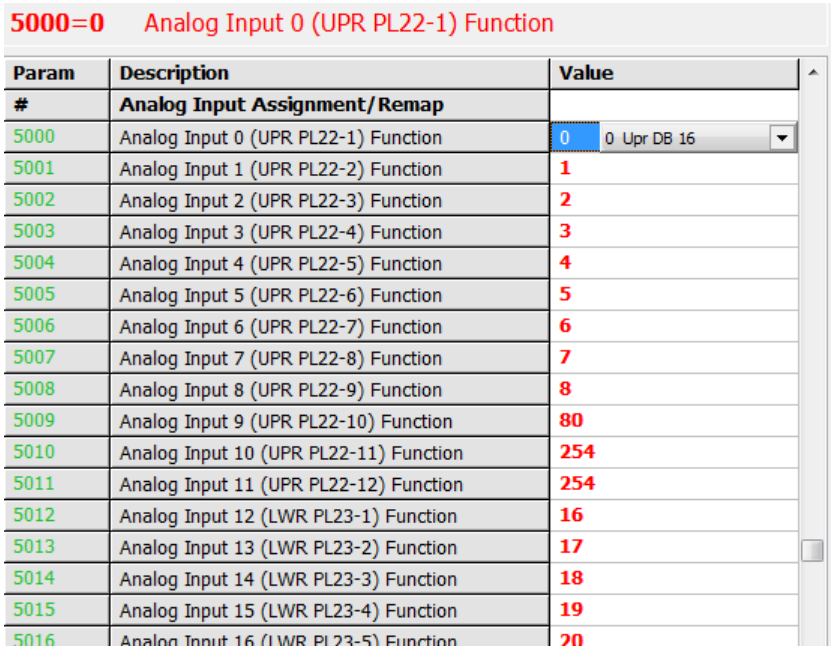
- Attach USB cable to HX3.5. PC should recognize a USB MIDI device.
- Open HX3.5 Editor's Update/Finalize window and click on *Start DFU*. The connected PC will close the USB MIDI connection and recognize a DFU device instead.
- The updater app “DreamDFU.exe” will be launched and display a file select dialog. DreamDFU should show a window as shown in picture.
- Open supplied DSP soundbank file, e.g. "Piano16_0x8050.dfu" or similar.
- Click on *Update Device*. A progress bar will indicate update process.
- When finished, close DreamDFU by clicking on *Abort* or the Close button.
- HX3.5 will revert to MIDI over USB mode.
- Click on *Close* on top of the HX3.5 Editor window, then *Connect* to re-establish the MIDI over USB connection.

Assigning Controls

Every analog and digital input of the HX3.5 board may deliberately be assigned to nearly any function. From factory the HX3.5 assignments mostly match the assigments of the older HX3 mk4 board.

Assigning analog inputs

Click on the button *Analog Remap* to activate the assignment table. In the table the assigned function for each analog input is listed as the parameter value. For example,



parameter 5009 has the function "Master Volume" assigned to input PL22 pin 10. If you have connected the TONE control to this input, set the value in the pull-down menu to "87 Tone Pot Equ". Make sure that you do not assign a function twice. Set unused inputs to "254 Not Assigned".

Assigning digital inputs

Click on the button *Button Remap* to activate the assigment table for the 16 digital inputs PL25/26 (and possibly more). Limitation: The inputs PL23 pin 1 to pin4 (for buttons at the bottom left side of Panel16) cannot be assigned deliberately, if the Panel16 configuration is set to vibrato knob or preset mode by *System Inits* parameter 1504.

Checking the controls

The parameter display will not be refreshed until you click on *Get Group* or *Get all Params*. With all analog inputs enabled (parameter 1503=2), check if changes on drawbars are to be seen on Upper DB resp. changes on all other analog input groups are to be seen when clicking on the *Get Group* button. Non-working analog inputs may have been remapped wrongly or to "not assigned". See Analog Remap group..

Live Events

Note: Following description applies to FTDI cable connection only. It is meant mainly for debugging: Click on green *Start Events* button to enable live update of displayed parameters (if its group is visible in main table, data will change instantly). The HX3.5 mainboard will now send an "event" to the editor when it detects a change of any analog or digital control. The Log Window will show each event. If an analog input is floating (not connected), it is likely you will get random data on a particular parameter number. Click on *Stop Events* to cancel live parameter updates. Note: Some functions (saving value groups, presets, finalizing) also stop event messaging; re-enable with *Start Events* if needed.

HX3.5 Editor on a Mac

Sorry, there is no Mac version of HX3.5 Editor available yet. But Mac users may use our application anyway. All you need is install a Windows environment, either by making use of Apple’s Boot Camp, or in a virtual machine like Parallels Desktop or Oracle’s free VirtualBox.

As an example, we are explaining how to set up and connect the HX3.5 Editor even in a very old Windows XP environment running in VirtualBox. We are assuming that you already have installed VirtualBox and the Windows XP operating system:

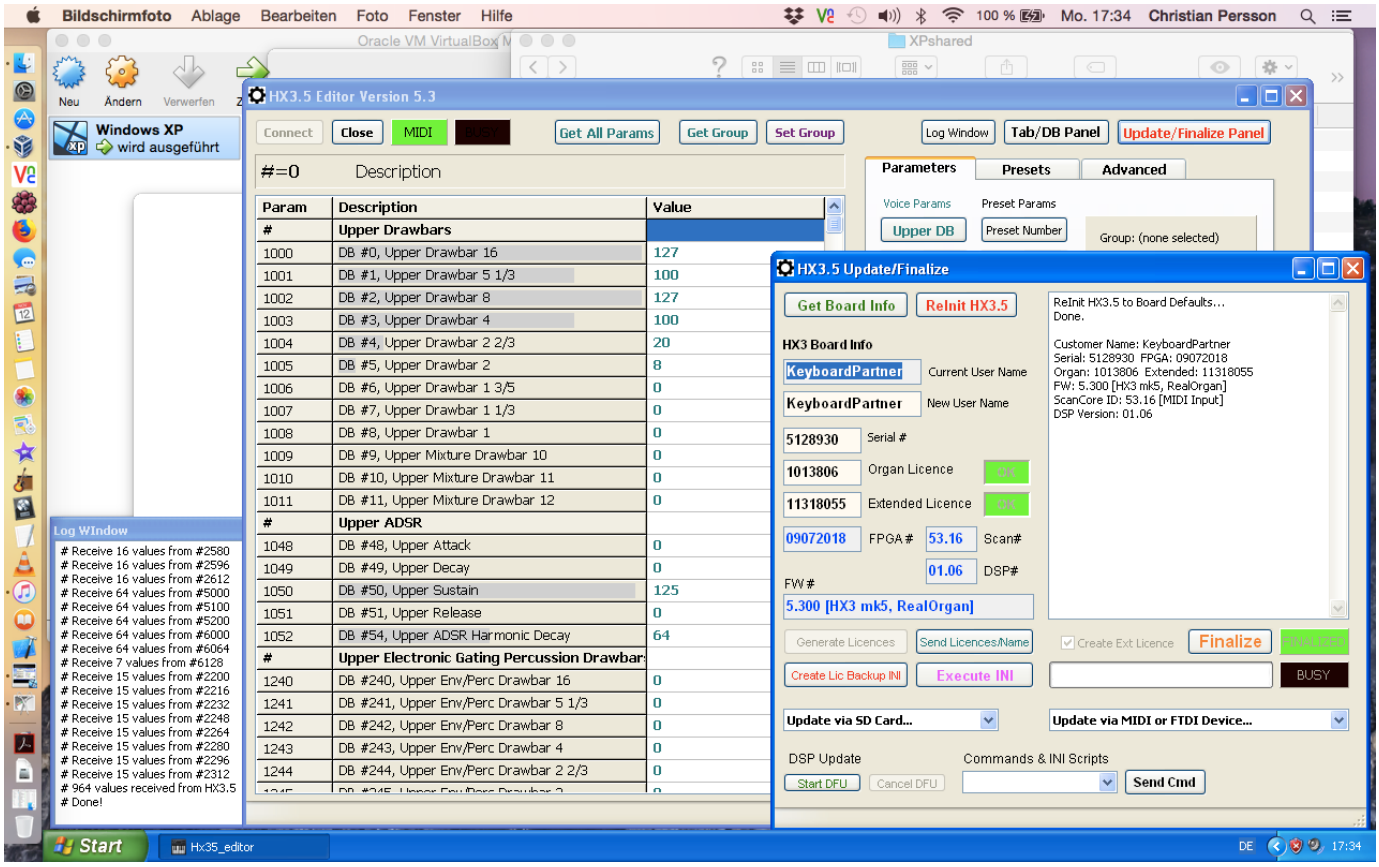
- 1 Download HX35_Editor_508.zip from the KeyboardPartner Github. Unzip the file and make sure all contents is in one folder on your virtual Windows machine. Since old Internet browsers for Windows XP are no longer supported, it may be impossible to access the KeyboardPartner Github Repository due to security settings. In this case you may perform the file downloads in the Mac environment and then transfer the files to the Windows environment through a Shared Folder.
- 2 Connect the HX3.5 board or device to your Mac via USB and power it up.
- 3 Launch VirtualBox and start up Windows XP.
- 4 Open VirtualBox pull-down menu ‘Devices’ and select ‘USB’.
- 5 Choose the entry ‘KEYBOARDPARTNER HX3_USB‘.

- 6 In the Windows environment, go to the editor folder and launch ‘HX35_Editor.exe’.
- 7 In the HX35 Editor window, click on *Connect*.
- 8 The ‘Select USB device’ window will open, check ‘USB audio device’ in MIDI input device as well as MIDI output device boxes and then *OK*.

Then you’re done. You may now use the HX3.5 Editor as described in the manual above.

After a firmware update is completed, the HX3.5 mainboard will reboot, disconnecting the USB port. This will usually result in an error message in HX3.5 Editor, since Windows XP in the VirtualBox environment is not able to re-establish communication. In this case you need to go back to topic 4 and re-connect the HX3.5 system. Click on the ‘Get Board Info’ button in the ‘Update/Finalize’ window to confirm the update has been performed successfully.

DSP updates in DFU mode may as well be performed in the VirtualBox on the Mac. Click on *Start DFU* as outlined in the section DSP Updates. Then select the entry “Keyboardpartner SAM 5504…“ in the USB menu of the VirtualBox. Now that let DreamDFU do its work. After that return to step 4 and re-establish the USB connection to the Editor.



HX3.5 Editor in der VirtualBox unter Windows XP auf einem alten MacBook

KEYBOARDPARTNER UG

Entwicklung elektronischer Musikinstrumente

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