HX3
SOUND ENGINE

User Manual

HX3.7 Manager

(as of Version 7.14, January 2025)

keyboardpartner.com

Contents

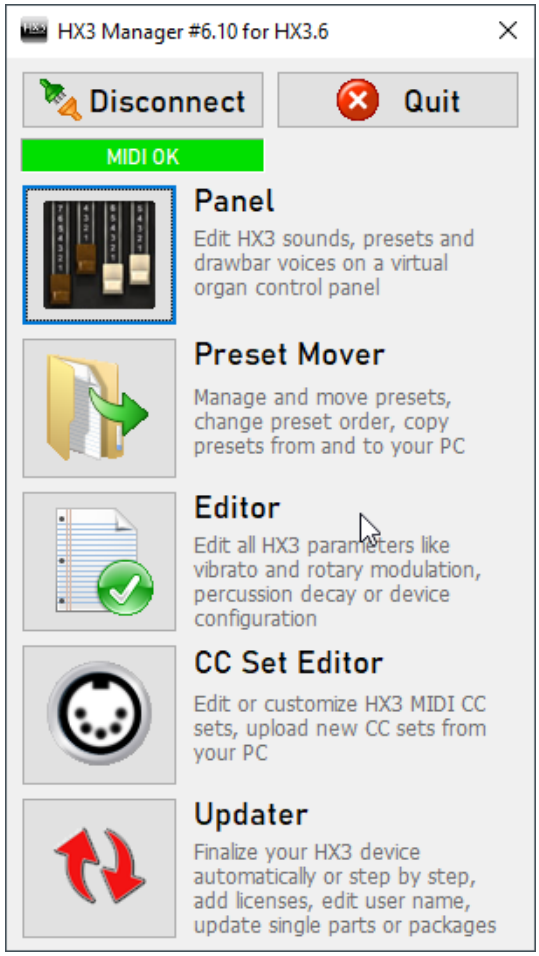
HX3.7 Manager

The Manager for HX3.7 systems is a Windows application. Installation is not required. Just unzip the update file hx37_manager_xxxx.zip into a directory on your PC and start the app from this directory.

How to connect your HX3 device to the HX3 Manager is described in the following chapter Connecting.

The HX3 Manager can also be used with MacOS, see chapter HX3 Manager on a Mac.

The HX3 Manager supports the use of your HX3 device with a variety of functions:



The **Panel** contains switches and drawbars for your HX3 device. In the panel window, you can adjust sounds and effects, as well as create, name, and save presets. When the panel is open, you can recall presets live using the function keys on your PC keyboard.

The **Preset Mover** makes it easy to manage presets. You can use it to try out, move, and rename presets. Also use the Preset Mover to transfer presets from a file to the HX3 device or to save presets to a file.

With the **Editor**, you can set up the HX3 for all conceivable hardware configurations, access all available parameters, and fine-tune sounds and effects.

With the **CC Set Editor** you can edit the MIDI CC Sets of the HX3, create new CC Sets or load them as a file from your PC. This allows you to make the best use of your keyboard controller to control your HX3 Expander, even if none of the included CC sets fit right away.

The **Updater** updates the operating software of your HX3 device. Use the Updater also to activate an Extended License or to change the user name.

In the start window of the HX3 Manager, click the button of the component you want to use.

The editors for older HX3 versions HX3.4, HX3.5 and HX3.6Remote are **not** suitable for HX3.7. Vice versa the HX3.7 Manager cannot handle older hardware versions.

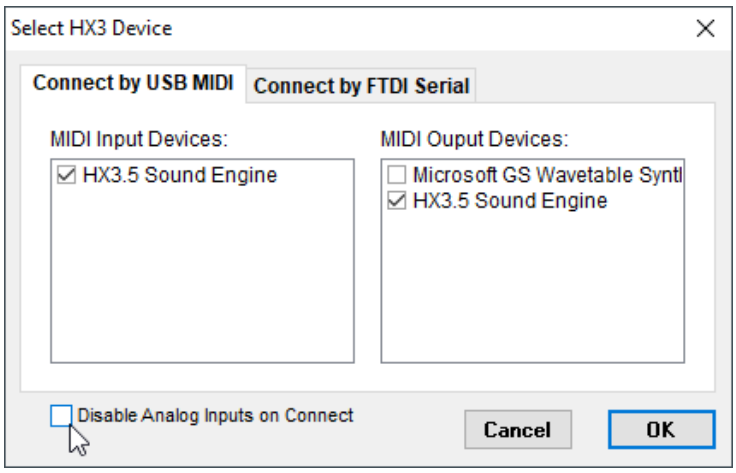
Connecting

HX3 Manager can connect to the HX3 mainboard through several channels:

- Preferably through **USB** using a cable to the B-type USB jack of the HX3 device, **updates can be made through USB only or, if available, via the SD card interface,**
- 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 HX3 6-pin header PL28 FTDI, the black cable on the side marked GND in the board imprint,
- 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.

Please adhere strictly: When using the USB jack, no cable must be connected to the secondary (left) MIDI input DIN jack.

In the start window of the HX3 Manager, click *Connect*.



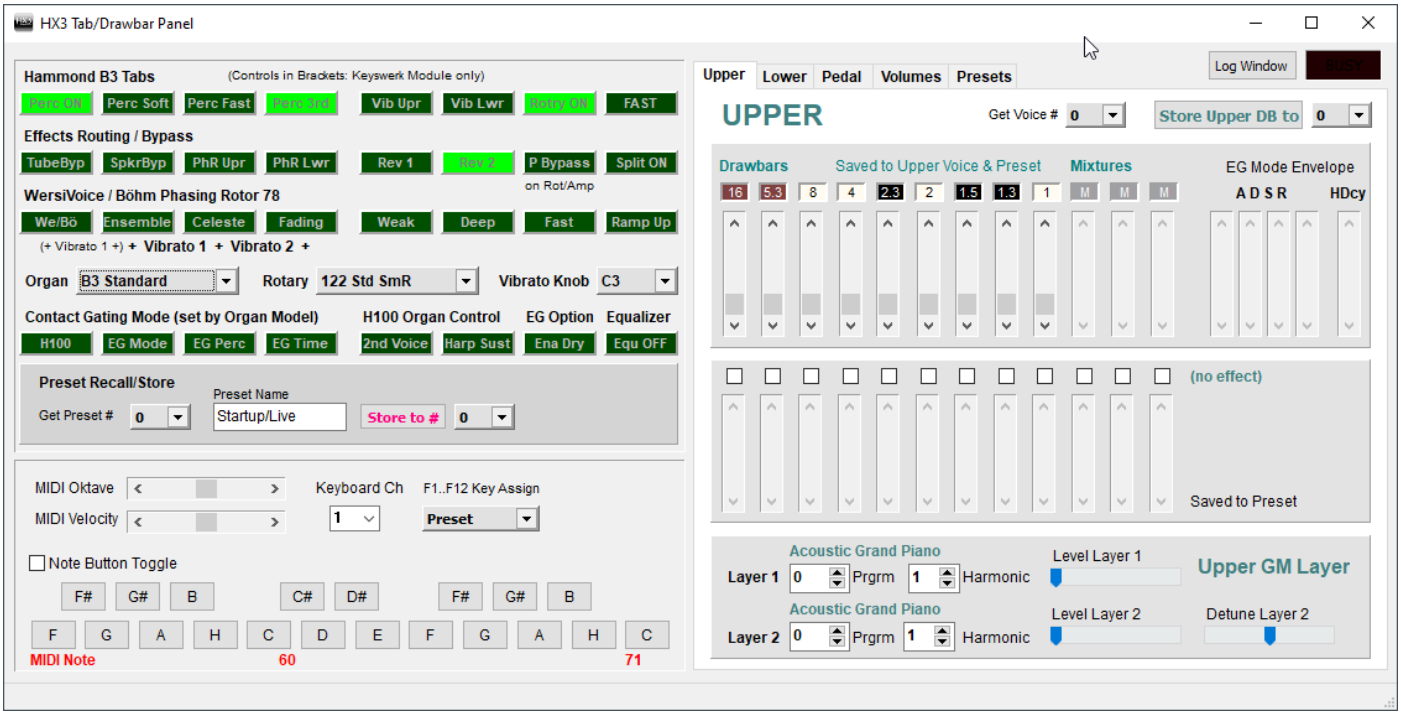
USB connection: Select *Connect by USB MIDI*. The HX3 device appears in the *Select HX3 Device* window as "HX3 Sound Engine" or similar. These entries are selected by default, and the connection is made via MIDI over USB. Select "USB Midi Cable" when connecting via USB MIDI interface.

FTDI connection: Select *Connect by FTDI Serial*. Select "FT232R", "TTL232R" or similar in the device lists. Windows will automatically install the FTDI driver the first time you use it. For older Windows versions, the driver may need to be installed manually. You will find instructions for this in the README file in the update directory.

Close the Input/Output Devices window by clicking on *OK*. When the connection is established, a green highlighted display appears at the top of the startup window and a log window opens showing the "Board Info" with the version numbers of the operating software components.

If no MIDI connection is established with Connect, open analog inputs are a possible reason. The inputs are floating and create a confused data stream that interferes with communication. In this case, activate the *Disable Analog Inputs on Connect* checkbox. If the connection now works, correct the settings as described in the Assigning Controls section. Re-enable the analog inputs if needed by setting parameter 1503 in the System Inits to match your configuration. Especially after changes to the configuration of your HX3 device, also pay attention to the Update Checklist.

Tab/Drawbar Panel



With the Tab/Drawbar Panel, the HX3 device can be operated using virtual controls. You can select organ and rotary models, set sounds and effects, and create, name and store presets. When the panel window is open, you can access presets live using the function keys on your PC keyboard.

The green buttons correspond to the buttons of a classic organ. Some functions are only available if an Extended License is installed. With the Standard License only the B3 models and *M3/M100* of the *Organ* pull-down menu can be used effectively, with the Extended License also *H100* and the various Transistor models.

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

Click the *Upper, Lower, Pedal* or *Volumes* tabs on the right to access the respective controls: Drawbars, switches to activate ADSR/Percussion (with Extended License only), the GM Layer and Volume controls. The *Upper, Lower*, and *Pedal* tabs allow you to save and recall voice presets that contain only the organ's drawbar settings. You can also add a GM Synth Voice Layer to the organ sound, or play it without an organ sound (set all drawbars to 0). The GM program numbers comply with the General MIDI standard.

Click the *Presets* tab to set which parameters are saved and recalled in Overall Presets, or to save or load backups of presets. See Presets Panel section.

By the way: Alternatively, the HX3 device system can be controlled with a tablet or smartphone, see User Manual HX3 TouchOSC, but **wireless not simultaneously with the HX3 Manager**.

HX3 Specials with Extended License

Depending on the set *Organ Model*, the *EG Mode Envelope* drawbars and the lower row of drawbars are activated. The latter change their function, as do the checkboxes above them, with the set *Organ Model*.

Perc ON/Soft/Fast also work in H100 mode (*H100* is ON). Percussion sounds on the harmonics activated with *H100 Percussion* checkboxes on the right (upper) when Perc ON is ON.

2nd Voice will disable the percussion decay circuit, so the percussion part of these harmonics will have a steady tone, bypassing vibrato and phasing rotor. This allows some nice chorus effects by routing some drawbars to effects, some not.

Harp Sust enables a decay/sustain effect on 4‘ harmonic.

In Electronic Gating mode (*EG Mode*), a soft-switching envelope generator is used instead of the B3-type "mechanical" key contacts. The ADSR parameters are controlled by the *EG Mode Envelope* drawbars on the right.

With EG Perc activated, the ADSR circuit forms a percussive sound. The percussive part is adjusted with the *Poly Perc Levels* drawbars, which are now active. The decay time is set with the Decay drawbar of the *EG Mode Envelope* group

If *Ena Time* is activated, the attack/decay/release times can be set to different lengths with the now activated *ADSR Time Modifiers* drawbars. This makes it possible to mimic the different response of long and short organ pipes.

With *Ena Dry* activated, the checkboxes on the right in all EG modes for the upper manual take over the function *Drawbar to Dry*: The harmonics marked thereby sound "dry", they bypass Vibrato and Phasing Rotor, which can be used to achieve nice chorus effects.

If *PercON* is activated with *EG Mode* or *EG Time*, the *Mono Percussion* checkboxes can be used to add H100-like percussion to individual harmonics.

The drawbar *HDcy* control (Harmonic Decay) algorithmically shortens/extends the decay/release times differently for all harmonics. This creates effects like from a Fourier synthesizer, since HX3 has a separate ADSR/VCA envelope generator for each foot position and each note on each manual.

The lower manual does not distinguish between the different EG modes. The checkboxes take over the *EG ADSR Enables* function when an EG mode is active. Activating a checkbox switches the associated lower manual harmonic to ADSR mode. Otherwise, only a sound without keyclick is heard.

The Extended License provides a second GM Synth Layer that can be detuned against the first to create a richer sound. Both layers can be harmonically transposed with respect to the drawbar base note.

Presets on PC 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, if the Panel is connected. To select voices quickly, choose upper manual, lower manual, or pedal in the drop down menu "F1..F12 Key Assign" or by hitting one of the keys U, I, or P, respectively. Push C or the spacebar to switch back to quick common preset selection.

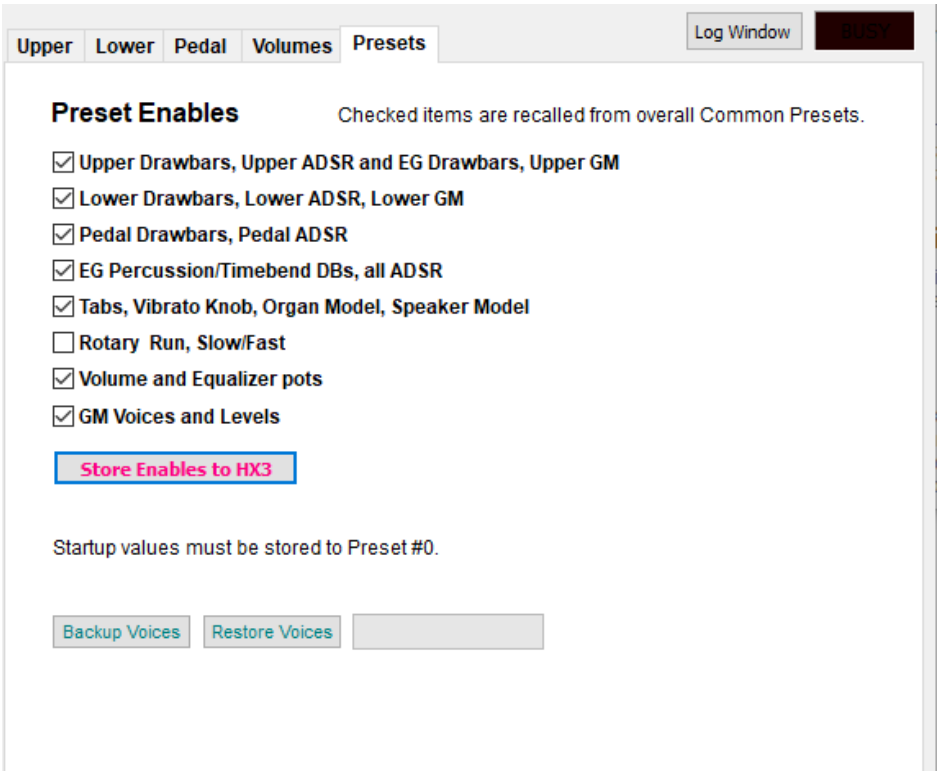
Saving Presets to the HX3 device

Adjust your preset to your needs with upper, lower, pedal, volumes and common controls. Edit the preset name as desired and choose a preset destination number in the dropdown menu. Then click on the *Store to #* button. An existing preset at this position will be overwritten. Preset names can include up to 15 characters, but not umlauts. Drawbar presets (voices) cannot be named. You save them with the controls at the top of the tab for the respective manual.

Presets Panel

Click on the *Presets* tab to open the Presets panel. On the Presets panel you can determine, which items are recalled with your presets.

Items that checked will be stored individually with single presets. Items that are not checked can be stored as default values and thus be valid for all presets.

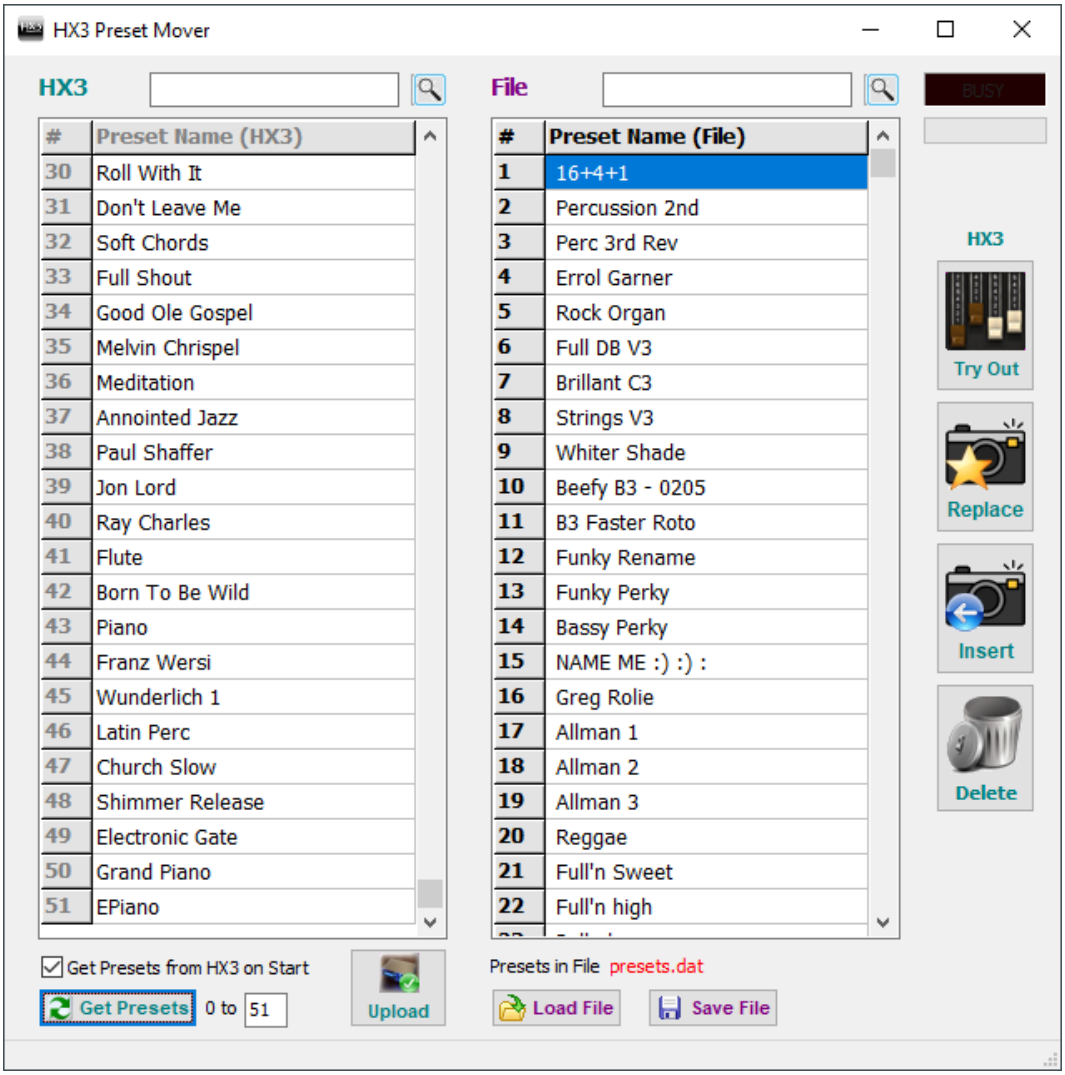


Preset Backup and Restore

Use the respective buttons to backup or restore presets or voices.

Common Presets can also be renamed, saved and loaded using the Preset Mover.

Preset Mover



With the Preset Mover you can easily manage your presets. You can try out, move, and rename presets. You can transfer presets from a file to the HX3 device or save them to a file.

The left column corresponds to the connected device, the right column to a preset file.

Click *Get Presets* at the bottom left to load the number of presets set next to the button from the connected HX3 device to the left column. Click *Upload* to transfer all presets from the left column to the device. Presets present in the device at the same positions will be overwritten.

Click *Load File* at the bottom right to load a preset file into the right column. Click *Save File* to save all presets from the right column to a file. If you select an existing file, its contents will be overwritten.

To try out a preset from either list, select it and click the *Try Out* button. The preset will then be activated on the HX3 device, but will not overwrite any existing preset. At the same time, the name and settings are displayed in the panel window and can of course be changed here if desired.

Please note: If you use *Store to* # in the panel, the preset will be stored in the HX3 device in the place set in the drop-down menu and may overwrite an existing preset.

Click *Insert* to insert the preset currently selected on the HX3 device before the preset currently selected in the Preset Mover. Click *Replace* to overwrite the currently selected preset. *Insert* and *Replace* work in both columns.

If you double-click on the name of the preset, you can change it. Click on another line to finish editing. Preset names can contain up to 15 characters, but no umlauts.

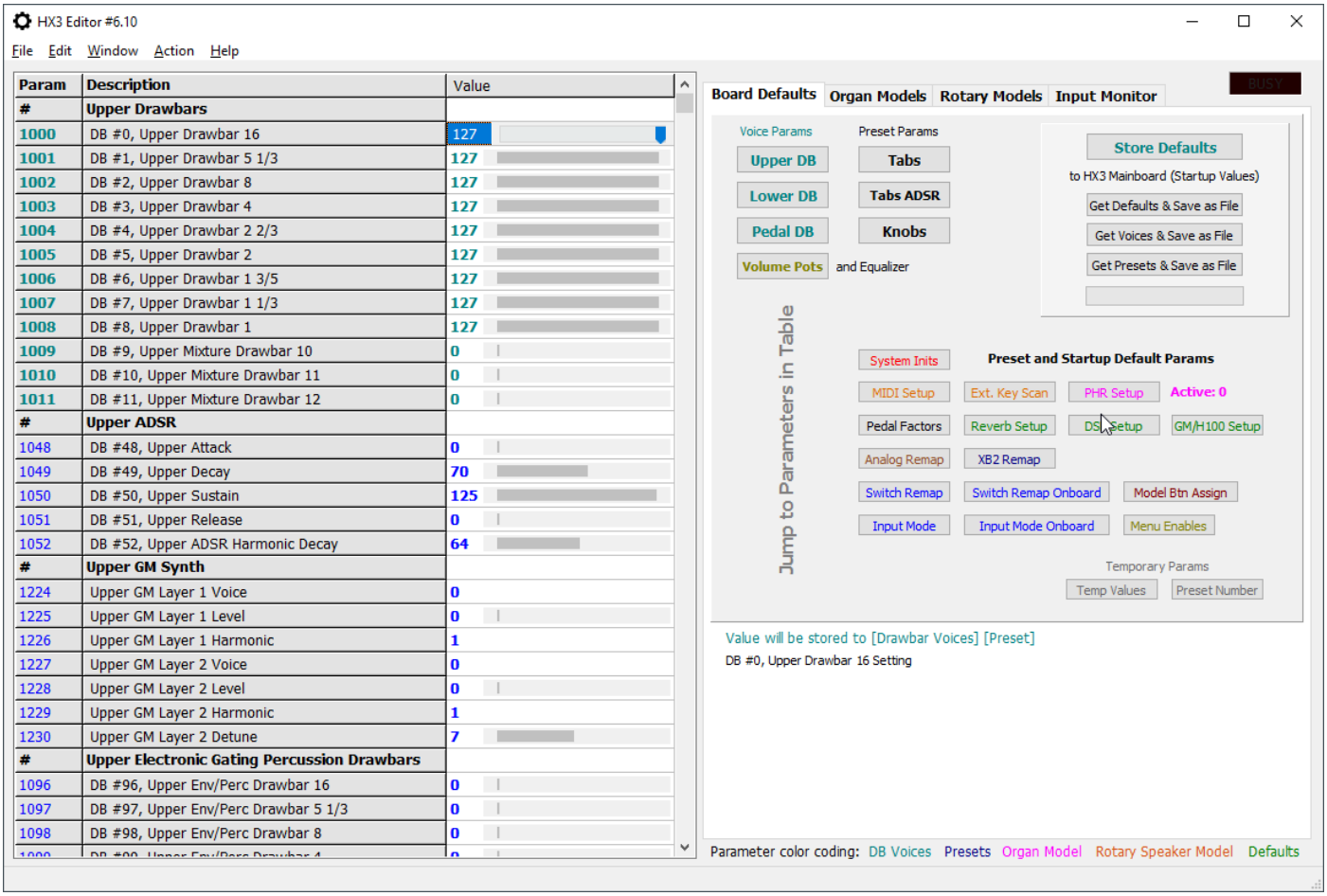
You can move presets individually or in as a block between the two columns. You can also move presets within a column and thus re-sort them. To select a block, hold down the Shift key. Hold down the left mouse button and drag the preset or block to the desired position. Drag to the *Trash* or click on the *Trash Icon* to delete the preset or block.

If you make changes in the Preset Mover in the left column, they will not be transferred to the HX3 device and saved permanently until you click the *Upload* button.

Changes made in the right column are not saved to a preset file until you click *Save File*.

The two columns in the Preset Mover can hold up to 200 entries each. However, *Upload* will only transfer the first 99 from the left column to the HX3 device. The rest are lost when the program is terminated. The right column, on the other hand, is saved in full to the preset file with *Save File*. Please be careful not to exceed the number 200, otherwise existing entries will be overwritten.

HX3 Editor



The Editor is a powerful tool for setting up the HX3. By means of the Editor you may set up the HX3 for any possible hardware configuration. You can access all available parameters and adjust sounds and effects.

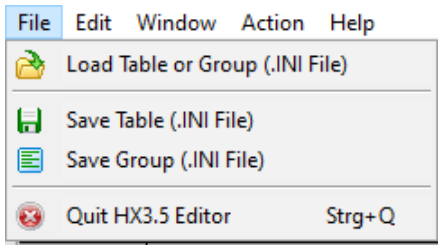
At the same time, HX3 Editor is KeyboardPartner's production tool; it does enable you as well to adjust your HX3 in a way that renders it completely useless for your configuration. **Please use the Editor with due diligence; do not adjust parameters without knowing what they mean**.

Important: First create a **backup** of the entire parameter table using the *Save Table* function in the File menu. The saved ini file contains all parameter numbers and values in plain text. You can open the file in a text editor and read values to undo individual changes. Use *Load Table or Group* to load the backup file back into the editor. Then select *Store All Values* in Action menu to transfer the data to the HX3 device.

On the right you see several buttons. The HX3 parameters are organized in groups. To find a particular parameter group, click on the corresponding button. The group will then move to the top of the table.

When you change values, they take effect immediately but are not stored. Click *Store Defaults* to permanently transfer all values from the table to the HX3 device.

File Menu

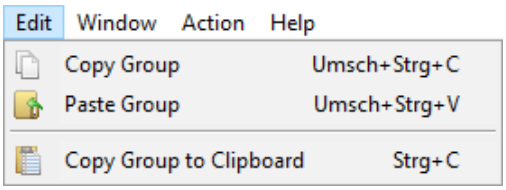


You can save all parameter values to a file using the *Save Table* function in the *File* menu and load them from a file using *Load Table or Group*.

Use this function to create a backup of the parameter values before you change settings so that you can revert to the old values if necessary.

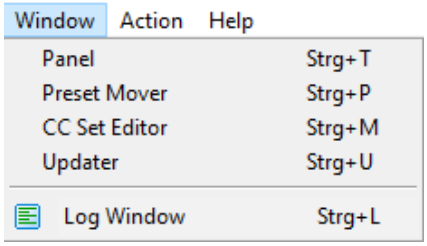
With *Save Group* you can save the values of a parameter group. When you load this file with *Load Table or Group*, the values are automatically placed in the table.

Edit Menu



In the *Edit* menu, you can use the *Copy* function to copy the values of a parameter group to the clipboard. With the *Paste* function you can paste the values from the clipboard into the currently activated parameter group. This function should be used with caution. The editor does not check whether the copied values make sense. *Copy Group to Clipboard* copies parameter names and values to the clipboard; this way you can copy them into a text editor for documentation purposes, for example.

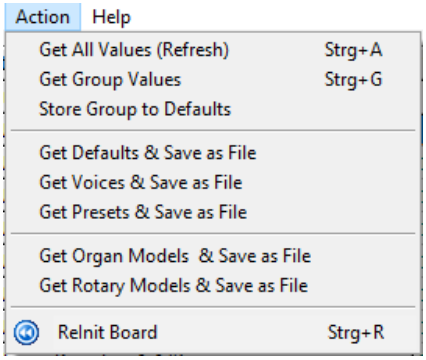
Window Menu



From the *Window* menu, just as from the Start window, you can call the Panel, Preset Mover, CC Set Editor and Updater components, optionally using keyboard shortcuts when the Editor window is open.

In the **Log Window** the communication is logged.

Action Menu



Get All Values (Refresh) and *Get Group Values* can be used to load parameter values from the device into the table. Normally this is not necessary because the values are already transferred at *Connect*. With *Store Group Values* parameter values of the currently active group are transferred to the HX3 device for permanent storage. The *Get & Save* functions are used during initial programming and are not relevant for the user. *ReInit Board* must be executed after updating the DSP or the Scan Driver.

Help Menu

Go to Entry leads directly to a selected parameter group, similar to the buttons on the right side of the editor window; however, the list contains more groups. *Find Parameter Number ...* takes you quickly to a specific parameter whose number is known.

Overview of the parameter groups

In this overview, parameter groups that are only relevant in connection with an Extended License or for OEM applications are set in *italics*. Parameter groups with factory settings that should not be changed are shown in blue font. The parameter numbers (#....) are assigned consecutively only within the groups.

Analog controls

#1000 Upper Drawbars, *#1048 Upper ADSR*, #1224 Upper GM Synth, *#1096 Upper Electronic Gating Percussion Drawbars:* displayed values changeable in the editor.

#1016 Lower Drawbars, *#1056 Lower ADSR*, #1232 Lower GM Synth: displayed values changeable in the editor.

#1032 Pedal Drawbars, #1072 Pedal 4 Drawbars AutoMix/*H100*, *#1064 Pedal ADSR*, #1240 Pedal GM Synth: displayed values changeable in the editor.

#1080 Volumes and Trim Pots, *#1091 RealOrgan Volumes:* displayed values changeable in the editor.

#1112 3-Band-Equalizer: displayed values changeable in the editor.

#1124 Potentiometer Mid Positions: allow presetting of the desired middle value for potentiometers with center detent.

Digital controls

#1128 Percussion/Vibrato/Rotary Buttons/Switches", #1136 Insert/Effect Buttons/Switches: displayed values changeable in the editor.

#1144 Phasing Rotor Control Buttons/Switches, #1152 Gating/Contact Modes, #1172 *Special Functions 1, 2, #1160 Upper/Lower ADSR Enable: Depending on the selected organ model*.

#1172: Special Function Tabs 1, #1192 Special Function Buttons 2.

#1260 Knobs (Rotary Switches, Menu or Radio Buttons): displayed values changeable in the editor.

#1268 Presets/Voices: displayed values changeable in the editor.

Preferences

#1352 Keyboard Settings: Depending on the selected organ model.

#1384 Organ Setup: Depending on the selected organ model.

#1480 Percussion Setup: Depending on the selected organ model

#1320 Scanner Vibrato Setup: Depending on the selected organ model.

#1272 Busbar Levels: Depending on the selected organ model.

#1288 Busbar Note Offsets: Depending on the selected organ model.

#1416 Mixture Levels: Depending on the selected organ model.

#3000 Pedal Drawbar Factors 16, 16H, 8', 8H: Mixing the harmonics for the automix pedal drawbars.

#1498 GM/Piano/*H100* Setup

#1368 MIDI Settings, 1520 MIDI Send Functions.

#1448 Rotary Control, #2104 Rotary Inits, #2148 Rotary LFO Phase Inits: Depending on the rotary speaker model selected.

#1400 Reverb Settings, #2000 Reverb DSP Setup

#1336 Phasing Rotor Setup (active PHR Program): *Momentary values, are taken from the following setup data, depending on the rotary speaker model selected.*

#2500 PHR Program 0 ... 7 Setup

#1496 Board/System Inits: Basic configuration settings.

#3500 External Key Scanner Configuration (OEM product, nothing to adjust)

#1464 Advanced Upper Routing Bits (Perc/ADSR Modify)

Function assignment for controls

#5000 Analog Input Assignment/Remap, Analog MPX Input Assignment/Remap

#5100 Button/Switch Input Assigns, ExtPanel 0 to ExtPanel 5

#5200 Button or Switch Select, ExtPanel 0 to ExtPanel 5

#5300 XB2 Button Input Assigns/Remaps

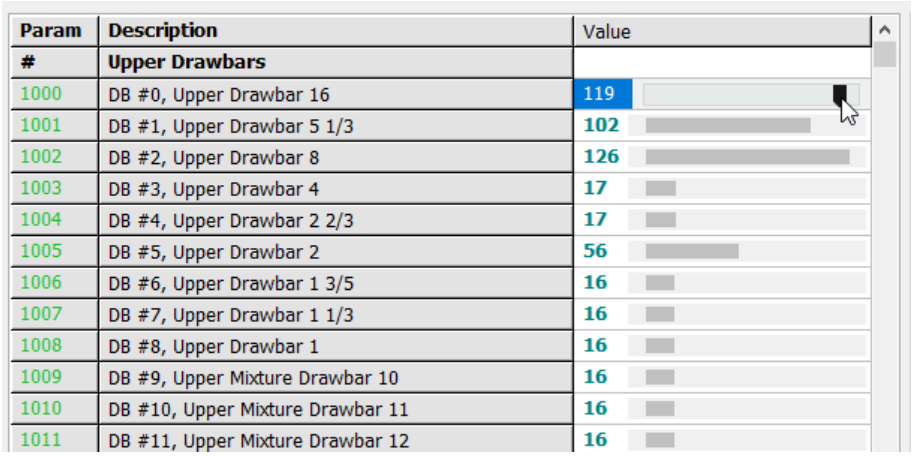
Parameters on the menu panel

#6000 Menu Enables Part 1, Part 2, Part 3: Selection of the parameters displayed and adjustable on the menu panel.

Parameter editing

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

A **help text** for the selected parameter appears on the right at the bottom of the main window. Depending on the type, for many parameters, when you click on the value, a variable scroll bar, an ON/OFF switch or a drop-down list appears.



Param	Description	Value
#	Upper Drawbars	
1000	DB #0, Upper Drawbar 16	119
1001	DB #1, Upper Drawbar 5 1/3	102
1002	DB #2, Upper Drawbar 8	126
1003	DB #3, Upper Drawbar 4	17
1004	DB #4, Upper Drawbar 2 2/3	17
1005	DB #5, Upper Drawbar 2	56
1006	DB #6, Upper Drawbar 1 3/5	16
1007	DB #7, Upper Drawbar 1 1/3	16
1008	DB #8, Upper Drawbar 1	16
1009	DB #9, Upper Mixture Drawbar 10	16
1010	DB #10, Upper Mixture Drawbar 11	16
1011	DB #11, Upper Mixture Drawbar 12	16

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

Normally all parameter values are transferred from the HX3 device on *Connect* and can be read in the table. In rare cases it may be necessary to retrieve the values. This is done with the *Get Group Values* or *Get All Values* entry in the *Actions* menu.

Changes to parameter values are always executed immediately, but they are not retained unless the parameter table is saved. *Store Defaults* stores all values of table in the HX3 device. The storage location depends on the parameter type and is indicated by a color coding of the parameter values (see legend in the lower right corner of the main editor window).

All black and turquoise colored parameter values are stored as **Common Preset**.

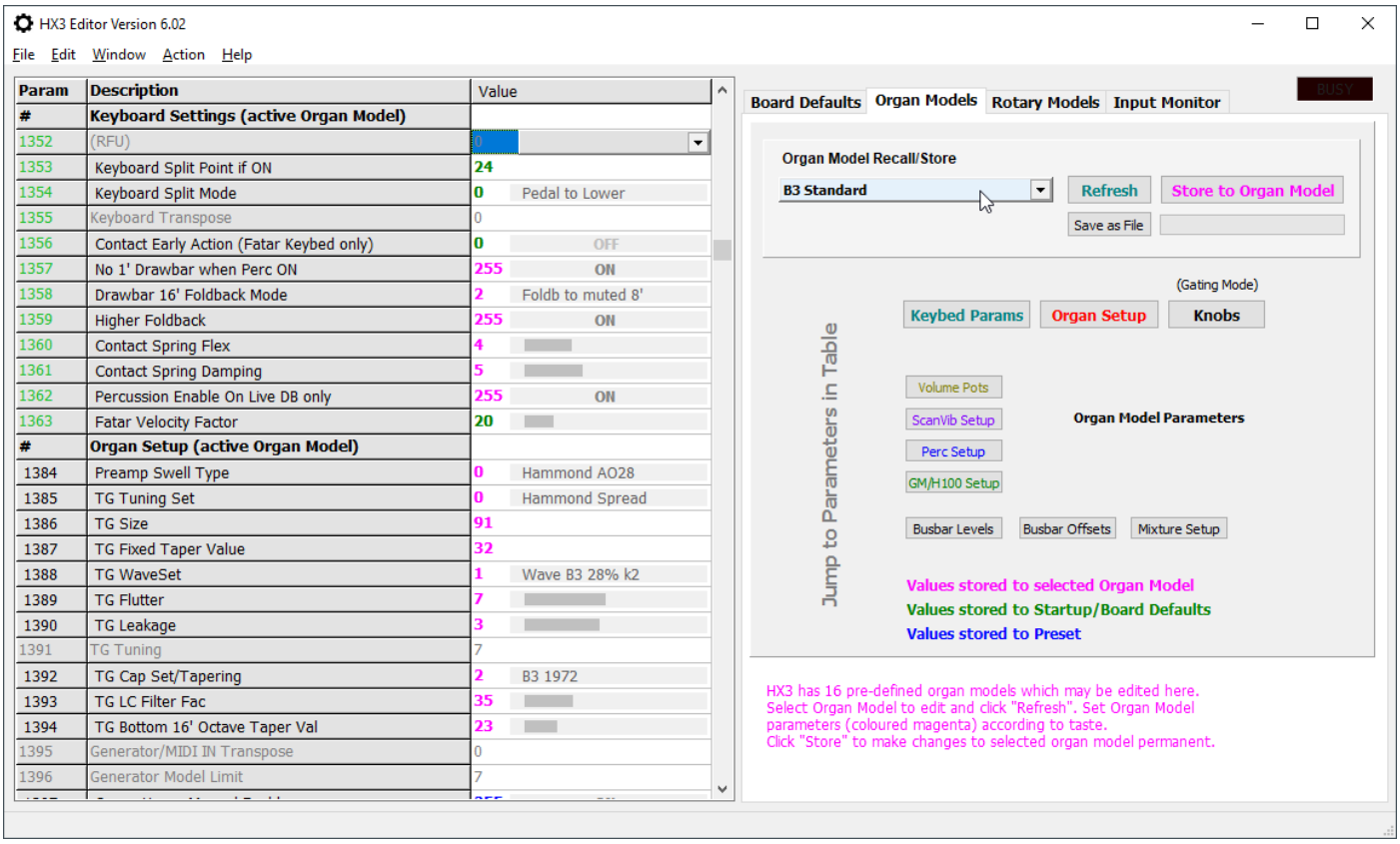
Red parameter values are stored as the power-on **default** value; they are common to all Voices and Presets. These settings can be lost during a firmware update in case of major version jumps.

Pink values (**System Inits**) are also saved as switch-on default values for all Voices and Presets. These parameter values remain untouched even with major firmware updates. Check these values carefully after changing your hardware configuration. Also check the values the first time you use a brand new motherboard that is configured as a MIDI Expander at the factory.

Values shown in grey should not be changed (read only).

Please note: Changes to MIDI settings in the MIDI submenu of the HX3 device interrupt the connection to the HX3 Manager. Parameter changes on the device are no longer displayed in the Manager. Re-establish the connection with *Connect*.

Editing Organ Models



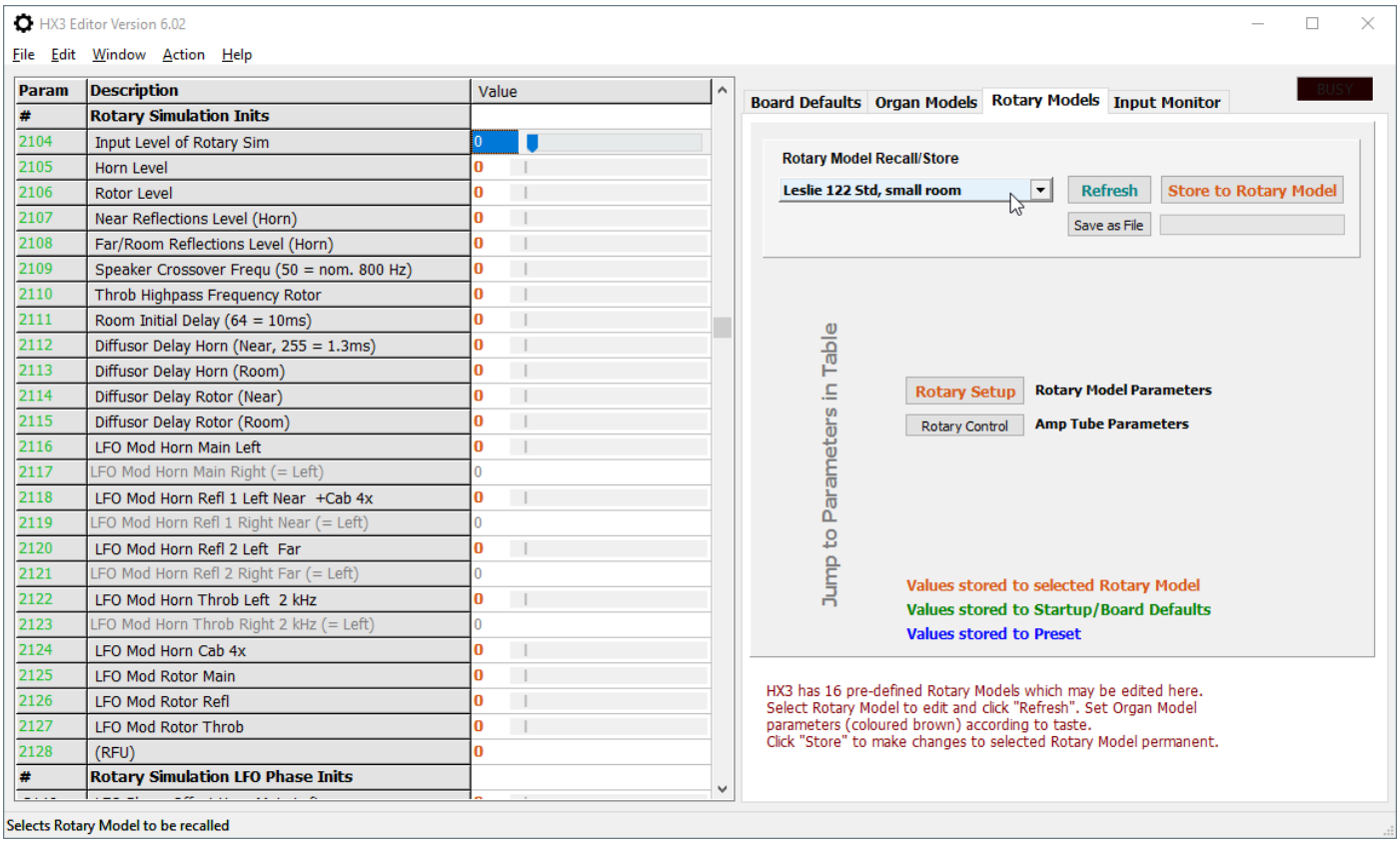
HX3 provides four organ models, with Extended License 16 organ models. The selected organ model can optionally be saved in Common Presets.

All settings are editable. Click on the *Organ Models* tab in the editor to edit the organ models. Select the model whose settings you want to change from the pull-down menu. In the parameter list, the associated settings are highlighted. Click *Refresh* to update the values.

Use the buttons to navigate to the associated parameter groups. Click *Store to Organ Model* to permanently save changed settings.

Click the *Save as File* button to save all settings to a file. If you want to undo changes, you can transfer the saved settings back to the device using the *Update via USB or FTDI cable* function from the Updater's *Update* menu.

Editing Rotary Models



HX3 provides four speaker rotary models, with Extended License 16 rotary speaker models. The selected speaker model can optionally be saved in Common Presets.

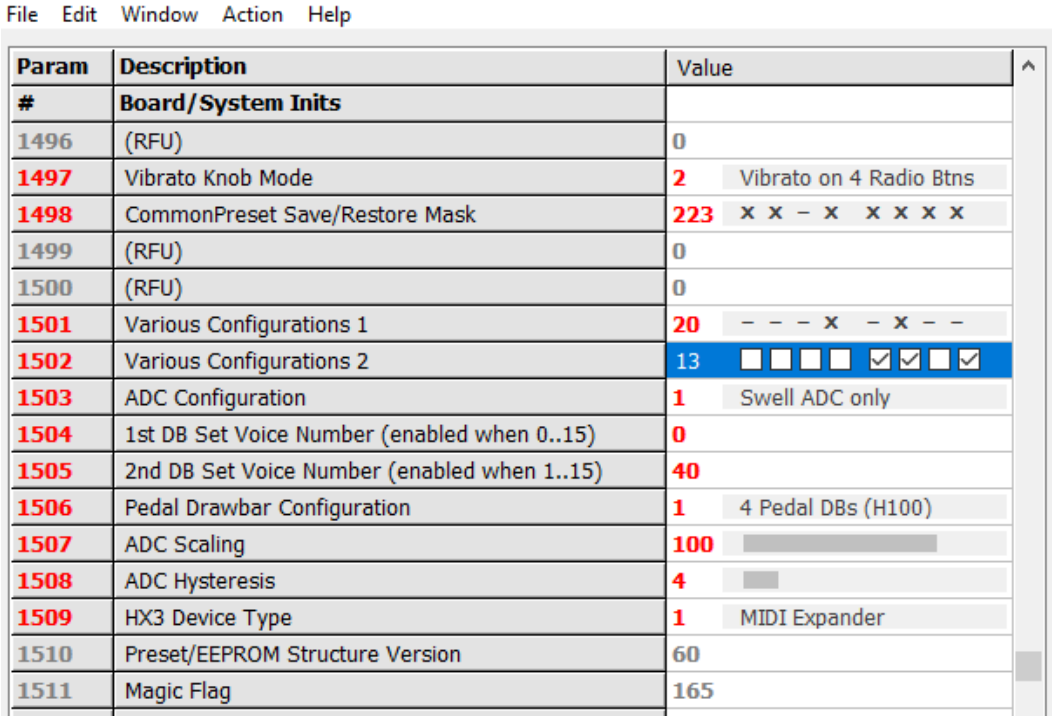
All settings are editable. Click on the *Rotary Models* tab in the editor to edit the speaker model settings. Select the model whose settings you want to change from the pull-down menu. In the parameter list, the associated settings are highlighted. Click *Refresh* to update the values.

Use the buttons to navigate to the associated parameter groups. Click *Store to Rotary Model* to permanently save changed settings.

Click the *Save as File* button to save all settings to a file. If you want to undo changes, you can transfer the saved settings back to the device using the *Update via USB or FTDI cable* function from the Updater's *Update* menu.

Setting up the Hardware Configuration

After changing the configuration to a different device type (e.g. from expander to drawbar organ), check the ***System Inits*** parameters with the Editor. These values are persistent even when firmware is updated.



Normally the values of this parameter group are set automatically by the "config_xxx.ini" file or “defaults.dat” file matching your device.

Factory programming of parameter 1503 **ADC Configuration** is "Swell only" for MIDI expander use, so set the configuration according to your needs.

Also, the “MIDI Input” **scan driver** is installed. If you are using FatarScan2 or Scan16/Scan61, install the appropriate scan driver “scanxxx.dat” contained in the Editor directory. If "scanfatr.dat" is installed, FatarScan2 must be connected, otherwise the communication with the HX3 Manager does not work anymore.

On custom installations, also check Analog Remaps and Switch Remaps (see section Assigning Controls) as the Editor will install default values here.

Select your desired configuration settings in parameter 1501 and 1502. Check if the setting of parameter 1497 "Vibrato Knob Mode" corresponds to your configuration.

With parameter 1498 you can define which settings should be stored and recalled with the Common Presets of the HX3. You can set the same on the preset page of the panel.

System Inits

Depending on firmware version, parameters shown in Editor may differ from picture.

1497 Vibrato Knob Mode. 0 = Rotary Switch PL24, 1 = 3 toggle buttons, 2 = 4 radio buttons.

1498 Common Preset Restore Mask. Determines, as does the Presets Panel, which params are saved to CommonPresets (see help text in editor window).

1501, 1502 Various Config Bits (see help text in editor window).

1503 ADC Configuration (0=off/module mode, 1 = swell pedal only, 2 = 0 to 24 internal inputs with DB9-MPX drawbar switching plus 0 to 64 external DBX/PTX inputs, 3 = 0 to 24 internal inputs plus 0 to 64 external DBX/PTX inputs with DBX drawbar switching.

1504, 1505 1st DB Select Voice Number/ 2nd DB Select Voice Number. Selecting this voice # on a manual (menu or preset16/preset12-2 associated with inverted preset keys) turns on the first or second drawbar set, respectively.

1506 Pedal Drawbar Configuration (0 = 2 Drawbars, 1 = 4 DBs, 2 = 12 DBs; if 0 or 1, the higher virtual pedal drawbars will be auto-adjusted according to setting.

1507 ADC Scaling for analog Drawbar Input control voltages (100 = 100%, more for limited potentiometer voltage range, eg. in MAG organs set to 120).

1508 ADC Hysteresis: Prevents changes to analog values due to crosstalk (default: 4).

1509 HX3 Device Type (see help text in editor window).

1510, **1511** Internal use, do not change.

Checking the controls

With all analog inputs enabled (parameter 1503=2), check if changes on drawbars are to be seen on *Upper DB* respectively changes on all other analog input groups are to be seen in the parameter table. Non-working analog inputs may have been remapped wrongly or to "not assigned". See Assigning analog inputs.

If a parameter value changes randomly, this indicates a “floating” analog input. This should be avoided as it leads to unwanted sound changes. Connect a control or disable floating analog inputs (value 254 in the *Analog Remap* section, see Assigning analog inputs).

Use the **Input Monitor** to find out which input a control element is connected to and quickly locate its position in the assignment. See section Input Monitor.

The value display for the controls is updated automatically as the HX3 device sends all changes to the editor, but only when the Input Monitor is not open.

Assigning Controls

Analog control elements such as drawbars or potentiometers and digital control elements such as switches or pushbuttons can be connected almost arbitrarily to the analog and digital inputs of the HX3 mainboard. The connector assignment can be found in the HX3.7 installation manual.

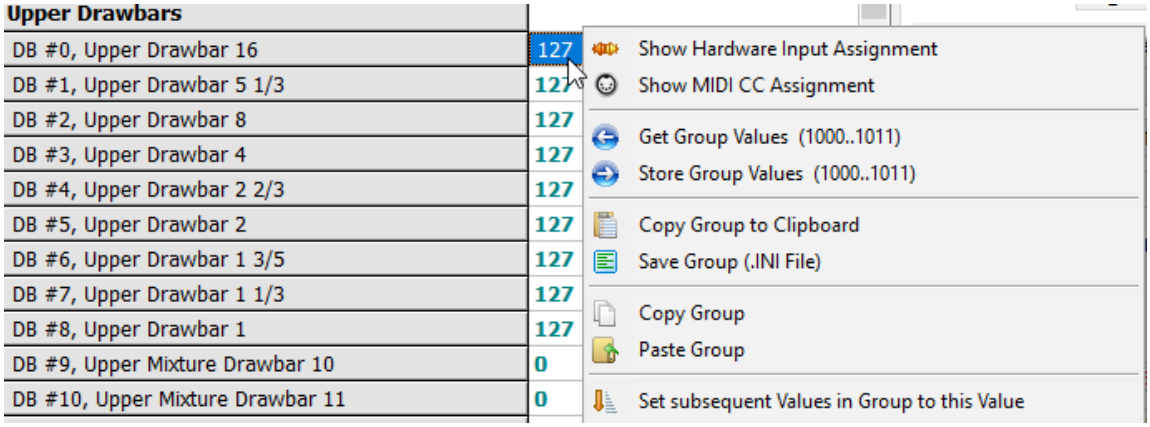
Up to 64 analog control elements such as drawbars and potentiometers can be used with DBX, ANX and PTX boards on the MPX port. Older DB9 and DB12 boards can be connected using the HX3.7 LegacyBoard. Mixed operation is also possible.

Up to 96 digital control elements such as buttons and switches can be used via up to 6 external boards (Panel16, Preset16 or Extend16). Like the menu panel, these are connected in series via an I2C bus system..

The assignment of the HX3 functions to the control elements is done by editor parameters in several groups, which we call assignment tables.

With the **Input Monitor** you can very quickly and easily find out to which input a control element is connected and jump to its position in the assignment table with a mouse click. See section Input Monitor.

Alternatively, right-click on the numerical value. A pull-down menu opens, from which you can click on the Show Hardware Input Assignment function to reach the corresponding position in the assignment table.



Show MIDI CC Assigment opens the CC Set Editor and shows the corresponding HX3 function. Here you can assign a MIDI CC or read an assigned CC. See also section CC Set Editor.

The functions Get Group Values and Store Group Values are identical to those in the *Action* menu.

Copy Group, *Paste Group* and *Copy Group to Clipboard* correspond to the functions in the *Edit* menu.

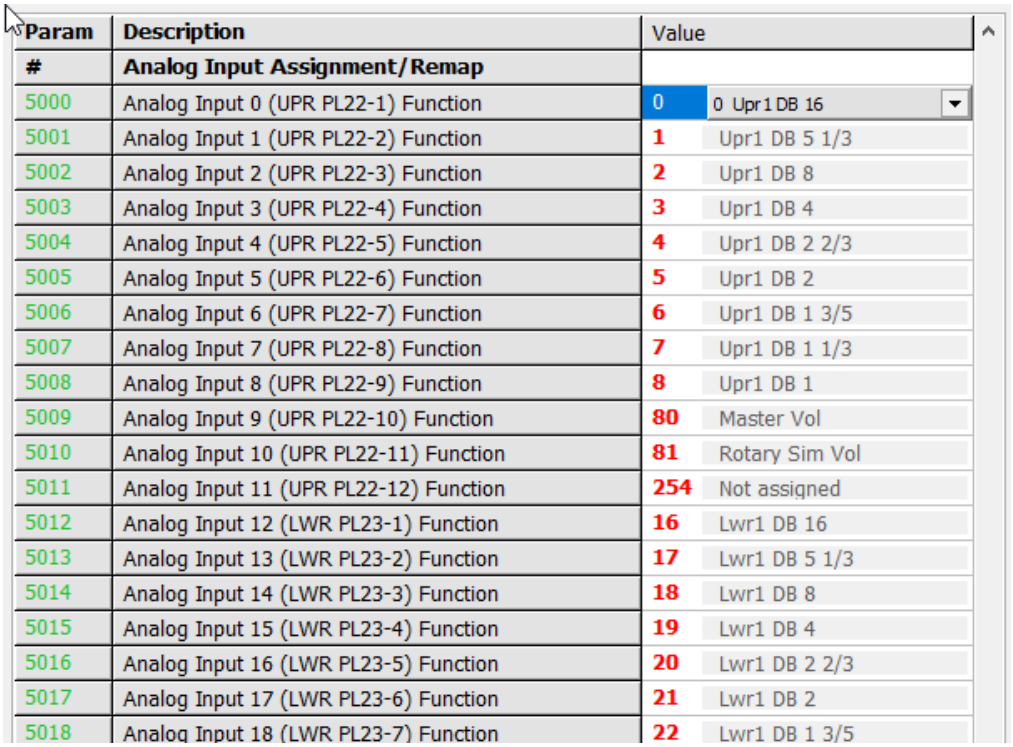
Save Group (.INI File) corresponds to the function of the same name in the *File* menu.

With *Set subsequent Values in Group to this Value* you can quickly and conveniently set all parameters of the active group to the same value.

Assigning analog inputs

Parameters #5000 to 5087 (Analog Input Assignment/Remap) are available in the Editor for assigning the analog inputs.

Call the assignment table as described before or with the *Analog Remap* button. For each analog input, you will find the assigned function as a value; a drop-down menu with the possible assignments is displayed in the currently active line. Use this to select the desired assignment, but you can also enter known values directly (double-click on the number).



Param	Description	Value
#	Analog Input Assignment/Remap	
5000	Analog Input 0 (UPR PL22-1) Function	0 Upr1 DB 16
5001	Analog Input 1 (UPR PL22-2) Function	1 Upr1 DB 5 1/3
5002	Analog Input 2 (UPR PL22-3) Function	2 Upr1 DB 8
5003	Analog Input 3 (UPR PL22-4) Function	3 Upr1 DB 4
5004	Analog Input 4 (UPR PL22-5) Function	4 Upr1 DB 2 2/3
5005	Analog Input 5 (UPR PL22-6) Function	5 Upr1 DB 2
5006	Analog Input 6 (UPR PL22-7) Function	6 Upr1 DB 1 3/5
5007	Analog Input 7 (UPR PL22-8) Function	7 Upr1 DB 1 1/3
5008	Analog Input 8 (UPR PL22-9) Function	8 Upr1 DB 1
5009	Analog Input 9 (UPR PL22-10) Function	80 Master Vol
5010	Analog Input 10 (UPR PL22-11) Function	81 Rotary Sim Vol
5011	Analog Input 11 (UPR PL22-12) Function	254 Not assigned
5012	Analog Input 12 (LWR PL23-1) Function	16 Lwr1 DB 16
5013	Analog Input 13 (LWR PL23-2) Function	17 Lwr1 DB 5 1/3
5014	Analog Input 14 (LWR PL23-3) Function	18 Lwr1 DB 8
5015	Analog Input 15 (LWR PL23-4) Function	19 Lwr1 DB 4
5016	Analog Input 16 (LWR PL23-5) Function	20 Lwr1 DB 2 2/3
5017	Analog Input 17 (LWR PL23-6) Function	21 Lwr1 DB 2
5018	Analog Input 18 (LWR PL23-7) Function	22 Lwr1 DB 1 3/5

For example, parameter 5009 has the function "Master Volume" assigned to HX3.7 input PL31 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.

Important: Set unused analog inputs to "254 Not Assigned", these are skipped during the query and may then as well be "open". The value "255 End of Assign Table" marks the end of the table group; the following inputs (only of this group!) are not considered.

If one of the table groups is not to be used at all, set the first entry of the unused group to "255 End of Assign Table".

Assigning dual drawbar sets

On our older DB9 MPX boards, switching two sets of drawbars per manual was fixed by default. The new DBX boards also allow two sets of drawbars per manual; to do this, *System Inits* parameter 1503 must be set to "3 DB9/12 and DBX ".

Set analog inputs for the second drawbar sets to an entry marked "Upr2" or "Lwr2" (values from 128). Drawbars assigned in this way become active when Drawbar Voice 1 (or the voice specified in *System Inits* parameter 1496) is called; for Voice 0, the drawbars with "Upr1" or "Lwr1" are active.

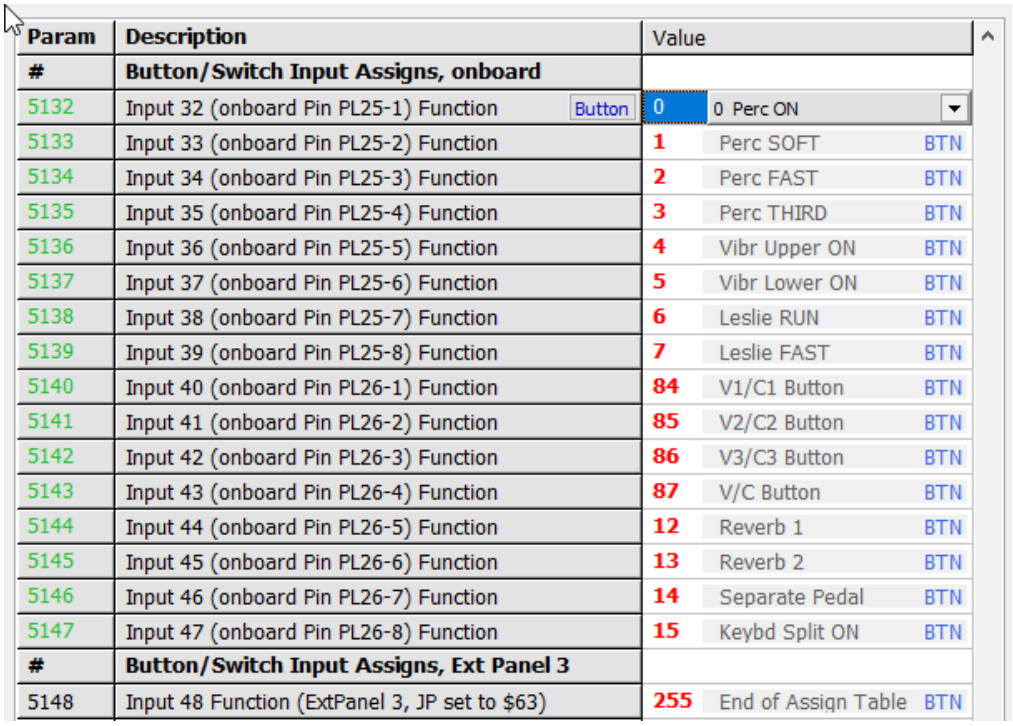
By the way, old DB9/DB12 drawbar sets can also be assigned to the internal inputs as a second set. For DB9 MPX boards use operation mode 1503 = "2 DB9/12 and DB9-MPX". In this operation mode additional analog inputs are also polled on MPX PL20, but without considering the assignments on "Upr2" and "Lwr2". Operation of the old DB9 MPX boards is not possible in operation mode 1503 = "3 DB9/12 and DBX".

Assigning digital inputs

To assign switch inputs to the desired HX3 functions, use the *Switch Remap* table groups.

With the parameters *Input Mode* you specify whether the inputs are switches (value ON) or pushbuttons (OFF).

Unlike analog inputs, digital inputs may also be open. Be careful not to assign any function more than once.



Param	Description	Value		
#	**Button/Switch Input Assigns, onboard**			
5132	Input 32 (onboard Pin PL25-1) Function Button	0	0 Perc ON	
5133	Input 33 (onboard Pin PL25-2) Function	1	Perc SOFT	BTN
5134	Input 34 (onboard Pin PL25-3) Function	2	Perc FAST	BTN
5135	Input 35 (onboard Pin PL25-4) Function	3	Perc THIRD	BTN
5136	Input 36 (onboard Pin PL25-5) Function	4	Vibr Upper ON	BTN
5137	Input 37 (onboard Pin PL25-6) Function	5	Vibr Lower ON	BTN
5138	Input 38 (onboard Pin PL25-7) Function	6	Leslie RUN	BTN
5139	Input 39 (onboard Pin PL25-8) Function	7	Leslie FAST	BTN
5140	Input 40 (onboard Pin PL26-1) Function	84	V1/C1 Button	BTN
5141	Input 41 (onboard Pin PL26-2) Function	85	V2/C2 Button	BTN
5142	Input 42 (onboard Pin PL26-3) Function	86	V3/C3 Button	BTN
5143	Input 43 (onboard Pin PL26-4) Function	87	V/C Button	BTN
5144	Input 44 (onboard Pin PL26-5) Function	12	Reverb 1	BTN
5145	Input 45 (onboard Pin PL26-6) Function	13	Reverb 2	BTN
5146	Input 46 (onboard Pin PL26-7) Function	14	Separate Pedal	BTN
5147	Input 47 (onboard Pin PL26-8) Function	15	Keybd Split ON	BTN
#	**Button/Switch Input Assigns, Ext Panel 3**			
5148	Input 48 Function (ExtPanel 3, JP set to $63)	255	End of Assign Table	BTN

For voice presets and common presets a group of buttons can be assigned in AddMode. The values are then binary coded, i.e. button 1 switches between 0 and 1, button 2 between 0 and 2, button 3 between 0 and 4, button 4 between 0 and 8 and so on. If you press several buttons at the same time, the values add up. For example, you can select presets from 0 to 15 with four buttons.

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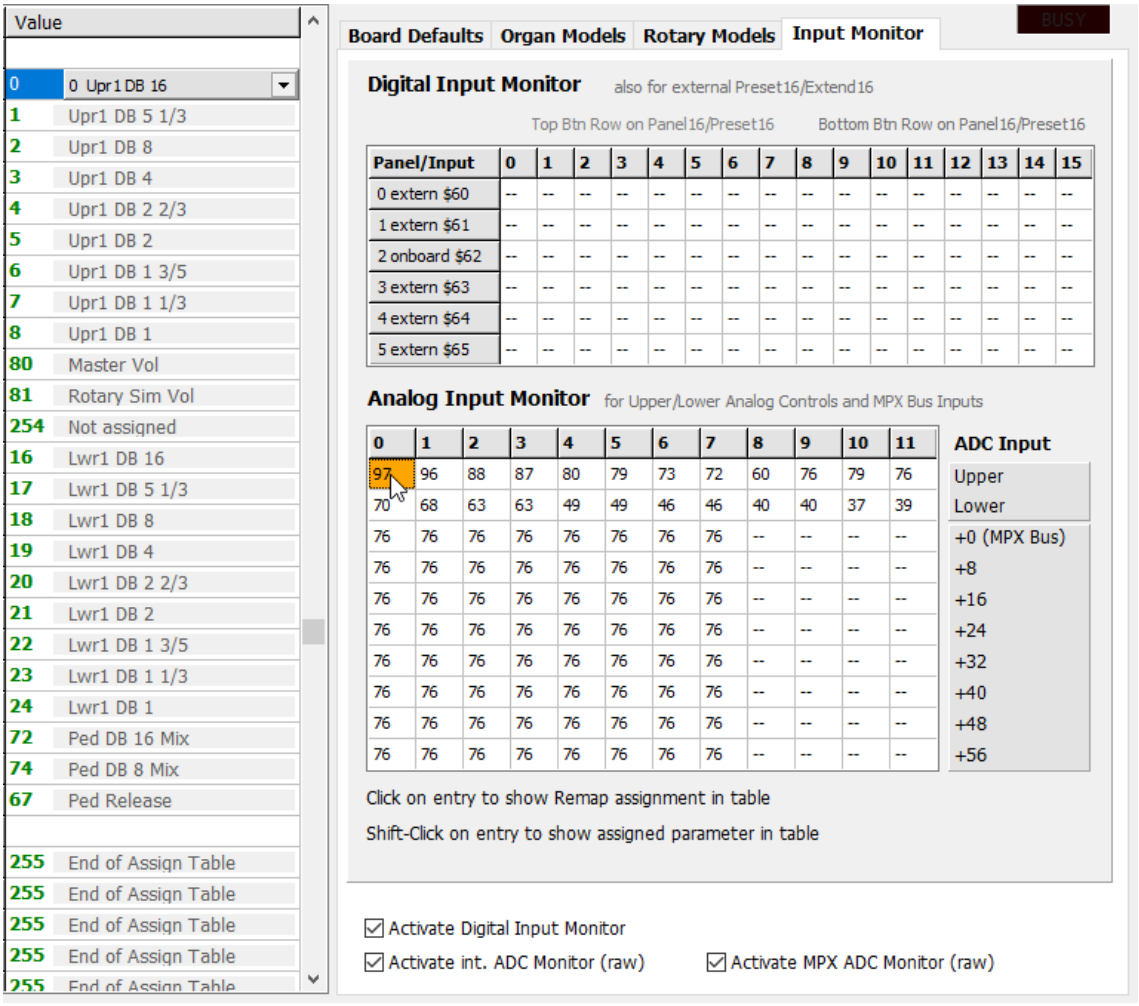
Input Monitor



The editor function *Input Monitor* supports you in assigning analog and digital control elements to the HX3 functions. Click on the Input Monitor tab at the top right of the editor window.

The **Digital Input Monitor** table displays the state of switches and buttons. The **Analog Input Monitor** table shows the raw values of the analog-to-digital converters (ADC) for drawbars, pots and other analog controls. Check the respective checkbox for the (internal) connectors located on the HX3 board or the components connected via the MPX bus. Unused analog inputs show random raw values in the Input Monitor, this does not indicate a fault.

If you click on a table field, the corresponding position in the parameter table is called up, where you can assign the desired function using the pull-down menu. Use Shift+Click to go to the parameter of the assigned function.

Please note: As long as the Input Monitor is open, value changes are only displayed in its tables. To check the function of the controls in the parameter table, first close the Input Monitor by clicking the tab *Parameter*. Do not forget to permanently save the edited assignment table with *Store Defaults*.

Configuring the HX3 menu

The HX3 menu system includes quite a number of entries for tuning the HX3 sound engine. For live performances you may prefer a scarcer, clearer menu. No problem: Configure the menu to your desire by using the Editor.

You may reduce the number of menu entries deliberately for your live configuration.

Click on the button *Menu Enables* on the right. This will select the first group of menu system entries in the parameter table. It starts with parameter 6000 “Enable HX3 Preset” (this one should be left ON all the time, however).

In the column *Value* click on a menu entry to witch it on or off. Menu entries switched to ON are 255, while menu entries switched OFF are 0.

The menu entries have been divided into three groups due to the large number. Scroll down the parameter table to reach the next group. It will be selected, if you click on a value in the column *Values*.

Once you have modified the menu items as desired, select *Store All Values* from the *Actions* menu to transfer the changes to the HX3 device.

Once the concise menu is configured as desired, you can save it to a file together with all other parameter values. Choose *Save Table* from the *File* menu. Save your Live Menu under a unique name.

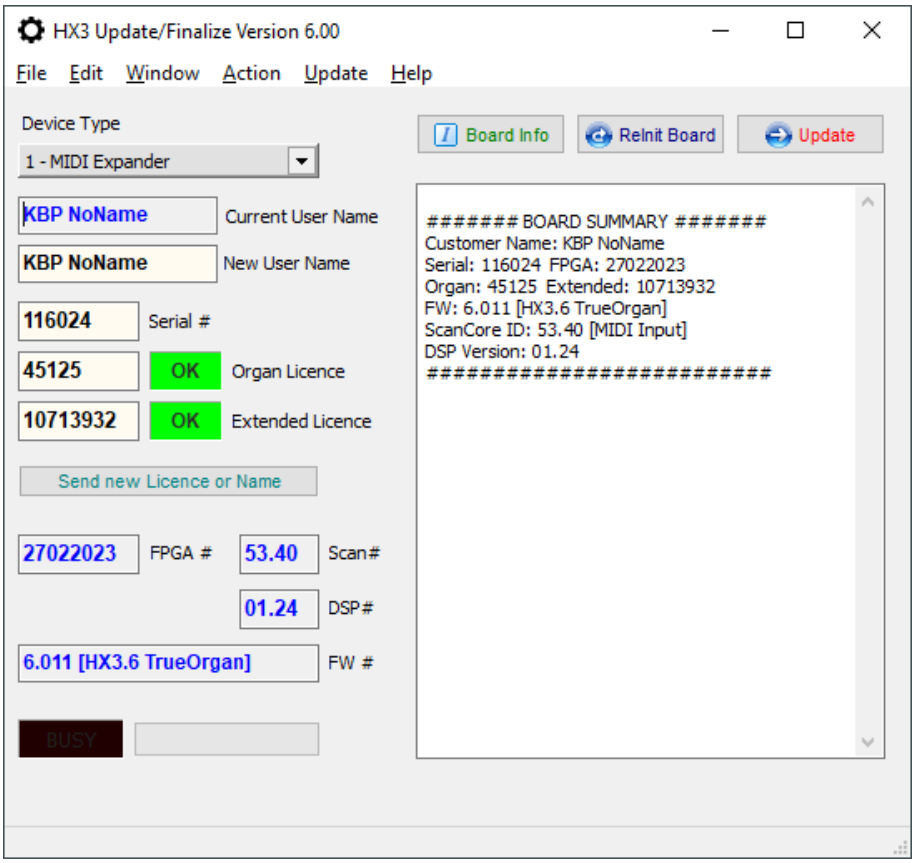
Whith an automatic update, the comprehensive default menu is installed again. To restore the saved menu configuration, load the file with *Load Table* and transfer the table to the HX3 device with *Store All Values*.

Alternatively, you can save only the parameter groups containing the menu enables individually as files. To do this, use the *Save Group* function in the *File* menu. When loading the respective file with *Load Table or Group*, the parameters are automatically sorted into the correct places in the table. Transfer the table with *Store Defaults* into the HX3 device.

Updater

The Updater is needed to install the HX3 operating software.

In the text field on the right the "Board Info" of the connected HX3 device appears. Here you can read the name of the user, the serial number of the HX3 mainboard, the license keys for "Organ" and "Extended" as well as the version numbers of the active parts of the operating software. The user name can be edited, an Extended License can be added.



Updates for HX3 consist of several parts:

- Controller Firmware (firmware.bin), handles user interface behaviour and MIDI CC
- FPGA Sound Engine (fpgamain.bin), all organ sound generation
- Scan Driver (scanXXXX.dat), handles keybed scanning or MIDI receive
- Wavesets (wavesetX.bin), waveform definitions for different organ models
- 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 (dsp_ff.dfu), reverb, sound generation by GM synthesizer
- DSP Sound Banks (gm_bank.dfu, ext_bank.dfu), audio wave table for GM synthesizer

There are also various files for preferences: default settings (defaults.dat), voice presets (voices.dat), common presets (presets.dat), factory parameter settings (params.dat), organ models (organs.dat), rotary models (speakers.dat) and MIDI CC sets (ccsetX.dat).

See the Changelog on our update server for details which files are to be updated since last commit.

On a factory programmed HX3 mainboard for organ installation, check Basic Settings first. In particular, the *System Inits* usually are default values appropriate for MIDI Expander use.

If controls do not work as before after an update, check the configuration settings in *Systems Inits*.

Checklist

- Is the **Organ License** OK "LED" lit (light green)? Otherwise, license number is invalid or a communication error occured reading it. You may need to enter the valid license number(s) again in the finalize window. Then click on *Send new Licence or Name*.
- Is the appropiate **Scan Driver** installed? Should be either MIDI Input for HX3 MIDI Expander and HX3 Drawbar Expander, or FatarScan or Scan16/61 driver for other configurations. You may replace the Scan Driver by using the Updater.
- Are HX3 **System Inits** correct? HX3 will not scan buttons or analog inputs if not set correctly. You can change the *System Inits* with the editor.

In order to **configure the board** for a particular device execute the appropriate file "config_xxx.ini" (xxx = device name) from the *File* menu of the Updater.

HX3.7 updates

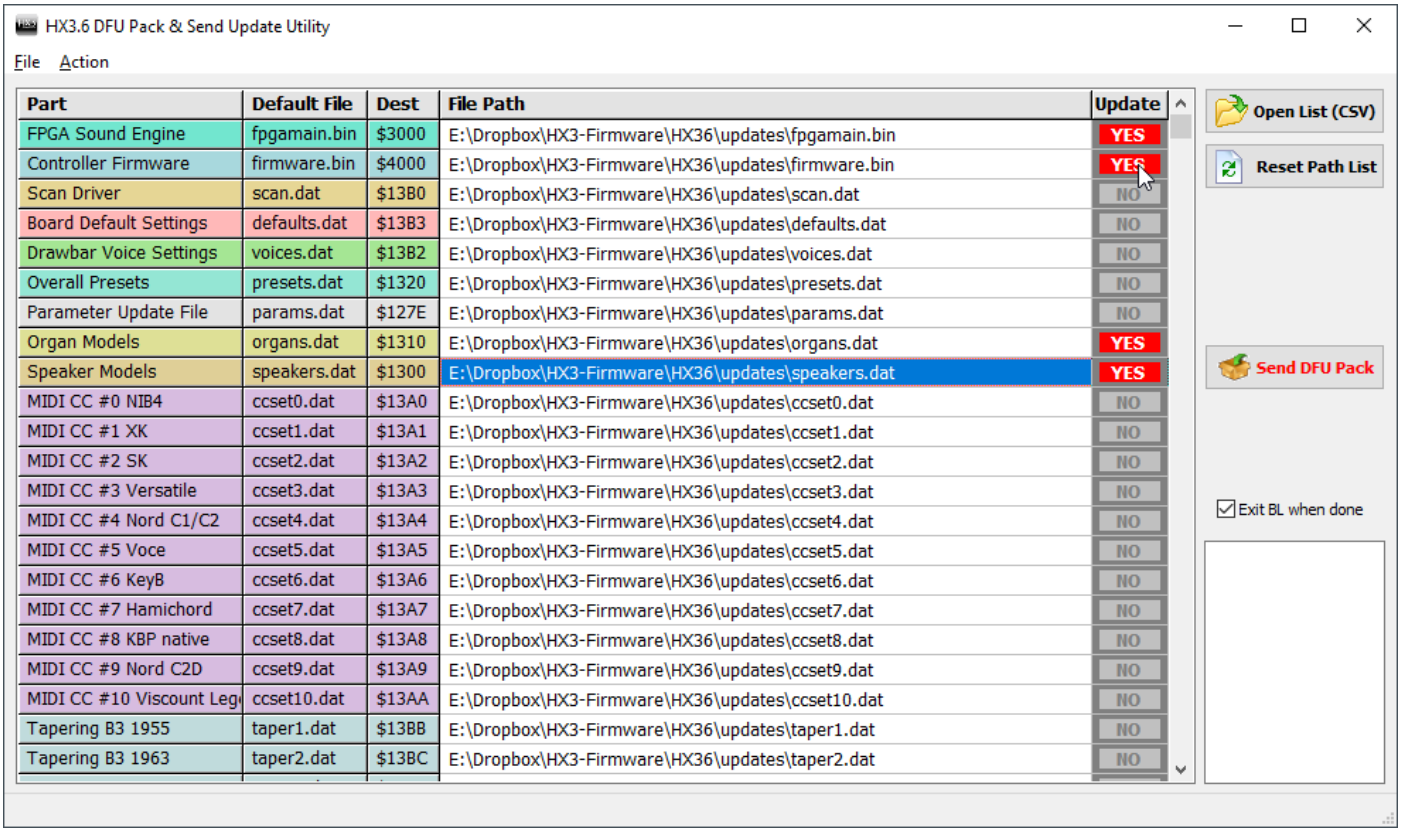
You can perform a **complete automatic update** with the utility app **DreamDFU for Windows** or **DreamDFU_kbp for MacOS** as described in the operating manual for your HX3 device. The Udater is not needed for this.

Under Windows you can also start the automatic update from the updater. Unfortunately, this does not work with Wine or CrossOver under MacOS, because these environments do not allow you to install a DFU driver.

If necessary, check and correct the type of your HX3 device under *Device Type* and click HX3.6 Update. The updater puts the device into DFU mode. The connection via MIDI over USB will be disconnected. A file selection dialog opens. Select the file hx36_upd.dfu from the updates directory.

After complete installation, a restart takes place. Afterwards you can re-establish the connection to the HX3.7 Manager with *Connect*. If you only want to update your HX3 device automatically, you can safely skip the following chapter.

Updates of single firmware components



Open the *DFU Updater* window from the *Window* menu:

Select the desired components from the list of available components by clicking on them in the Update column on the right. Set the device to DFU mode via menu. Activate the checkbox Exit BL when done, so that the DFU mode is automatically terminated after the transfer. Then click *Send DFU Pack*. After the installation is finished (as indicated on the menu panel), re-establish the connection via MIDI over USB via *Connect*.

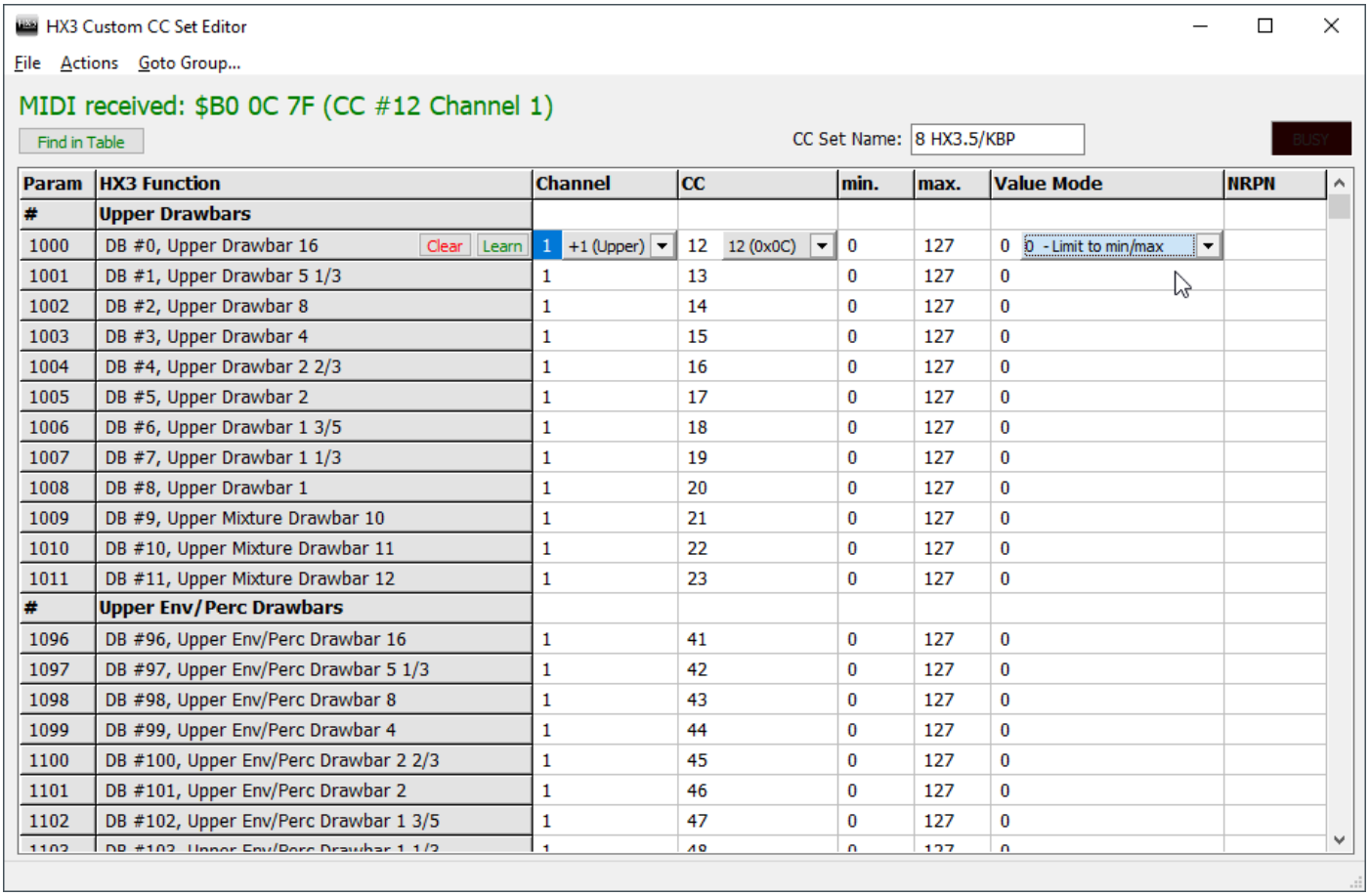
With CrossOver and Wine under MacOS the transfer function is unfortunately not usable, because these environments do not allow to install the required DFU driver. Use the DreamDFU_kbp app instead. To do this, pack the selected components into a DFU package using *Create DFU Package as File* from the Action menu. Some components can also be transferred to the HX3 device using the *Update via USB or FTDI cable* function from the *Update* menu.

Updates via SD Card

Update files may as well be provided on a SD or SDHC card. An appropriate SD card adaptor is available at our shop. Updates from SD card may as well be initiated in the *Update* menu or automatically on power-up. Attach the SD card adaptor to HX3 mainboard PL17. For details please see guidance “HX3.7 SD Card Usage”.

To use an SD card, please double-click on the appropriate batch file “make_sdcard_xxx.bat” (“xxx” representing your configuration) in the update directory. This will generate a sub directory containing all files for the SD card. Copy the files to the root directory of an empty card.

CC Set Editor



Param	HX3 Function	Channel	CC	min.	max.	Value Mode	NRPN
#	**Upper Drawbars**						
1000	DB #0, Upper Drawbar 16 Clear Learn	1 +1 (Upper)	12 12 (0x0C)	0	127	0 - Limit to min/max	
1001	DB #1, Upper Drawbar 5 1/3	1	13	0	127	0	
1002	DB #2, Upper Drawbar 8	1	14	0	127	0	
1003	DB #3, Upper Drawbar 4	1	15	0	127	0	
1004	DB #4, Upper Drawbar 2 2/3	1	16	0	127	0	
1005	DB #5, Upper Drawbar 2	1	17	0	127	0	
1006	DB #6, Upper Drawbar 1 3/5	1	18	0	127	0	
1007	DB #7, Upper Drawbar 1 1/3	1	19	0	127	0	
1008	DB #8, Upper Drawbar 1	1	20	0	127	0	
1009	DB #9, Upper Mixture Drawbar 10	1	21	0	127	0	
1010	DB #10, Upper Mixture Drawbar 11	1	22	0	127	0	
1011	DB #11, Upper Mixture Drawbar 12	1	23	0	127	0	
#	**Upper Env/Perc Drawbars**						
1096	DB #96, Upper Env/Perc Drawbar 16	1	41	0	127	0	
1097	DB #97, Upper Env/Perc Drawbar 5 1/3	1	42	0	127	0	
1098	DB #98, Upper Env/Perc Drawbar 8	1	43	0	127	0	
1099	DB #99, Upper Env/Perc Drawbar 4	1	44	0	127	0	
1100	DB #100, Upper Env/Perc Drawbar 2 2/3	1	45	0	127	0	
1101	DB #101, Upper Env/Perc Drawbar 2	1	46	0	127	0	
1102	DB #102, Upper Env/Perc Drawbar 1 3/5	1	47	0	127	0	

When the CC Set Editor is called, the current CC Set is loaded. If you want to modify another existing CC Set, select it from the *Action / Retrieve CC Set from HX3* menu. The CC Set #0 is limited editable because it contains proprietary encoding.

The *HX3 Function* column in the Editor contains all functions that can be controlled by MIDI commands. Set the MIDI channel under Channel and the CC numbers under CC according to the MIDI implementation table of your keyboard. The MIDI channel is an offset to the base channel set on the HX3 minus 1. As of version 5.711 NRNPs, such as Hammond uses, can also be set in the right column (MSB, LSB in hexadecimal notation, e.g. "$1200"). The data values transmitted with MIDI CC #06 are placed in the same line.

Alternatively, you can use the **learning function** of the Editor: Use the control element that you want to assign. The last received MIDI message will then be displayed in green letters above the table. To check whether this MIDI message is already assigned, click the *Find in Table* button. To assign an HX3 function, select the appropriate row and click the *Learn* button. The CC Set Editor only displays incoming MIDI commands in the set channel range (base channel +3).

Take care not to assign CC numbers twice. For some functions, however, it can also be useful to use the same CC number more than once, for example for a chorus/vibrato rotary switch. In this case, the function is determined more precisely based on the data value received. This setting option can be found under "Special Range Functions" at the bottom of the table. Multiple CC numbers must appear consecutively.

In the section "Special Range Functions" you will also find two "Dummy Functions". If you assign them, the HX3 system will do nothing when it receives this MIDI data. The Dummy Functions are used to prevent unwanted reactions to MIDI data that some keyboards send under certain circumstances, for example Sustain when receiving CC #64.

The default value range is from 0 to 127 for drawbars and potentiometers, but also for switches (0 = Off, 127 = On). For some functions, the value range is smaller, which you can set in the *min.* and *max.* columns.

In the column *Value Mode* you choose how received MIDI data is interpreted:

- *Limit to min/max* Values below or above the range are limited to the respective end value.
- *Scale to min/max* If a smaller value range is set, e.g. 0 to 5, the received values 0 to 127 are scaled to the set range.
- *Only if in range* Only values within the set range are regarded.
- *Invert value* Received values are inverted, i.e. 0 becomes 127, 127 becomes 0.
- *Toggle value* The function is switched on and off alternately each time the control element is operated.
- *Mid Threshold* When the average value between min and max is exceeded, a function is switched on.
- *Inverted Threshold* When the average value between min and max is fallen short of, a function is switched on.
- *ON if in Range* The selected function is switched on when the CC value is between min and max.
- *Multiply by (max/min)* The received value is multiplied by the max value and divided by the min value. This is useful to extrapolate limited range CC values to a range needed by a particular HX3 parameter. Example: to multiply incoming values by 1.5, set max to 3 and min to 2.
- *ON if in Range, OFF it not* The selected function is switched on when the CC value is between min and max and OFF if not.

Any change to a setting is immediately transferred to the HX3 unit for trial and error when you exit the field with Return or Tab, but is not yet stored permanently.

When all settings have been made as desired, you can give the CC Set a name in the *CC Set Name* edit box and transfer it to the device with the menu item *Actions / Send CC Set to HX3 as…* to a location of your choice. The memory locations from 1 to 10 are available for this purpose. The location 0 "NI B4" is not suitable for own CC sets because of a special decoding. The assigned name will then be displayed on the menu panel in the "MIDI Setup" submenu.

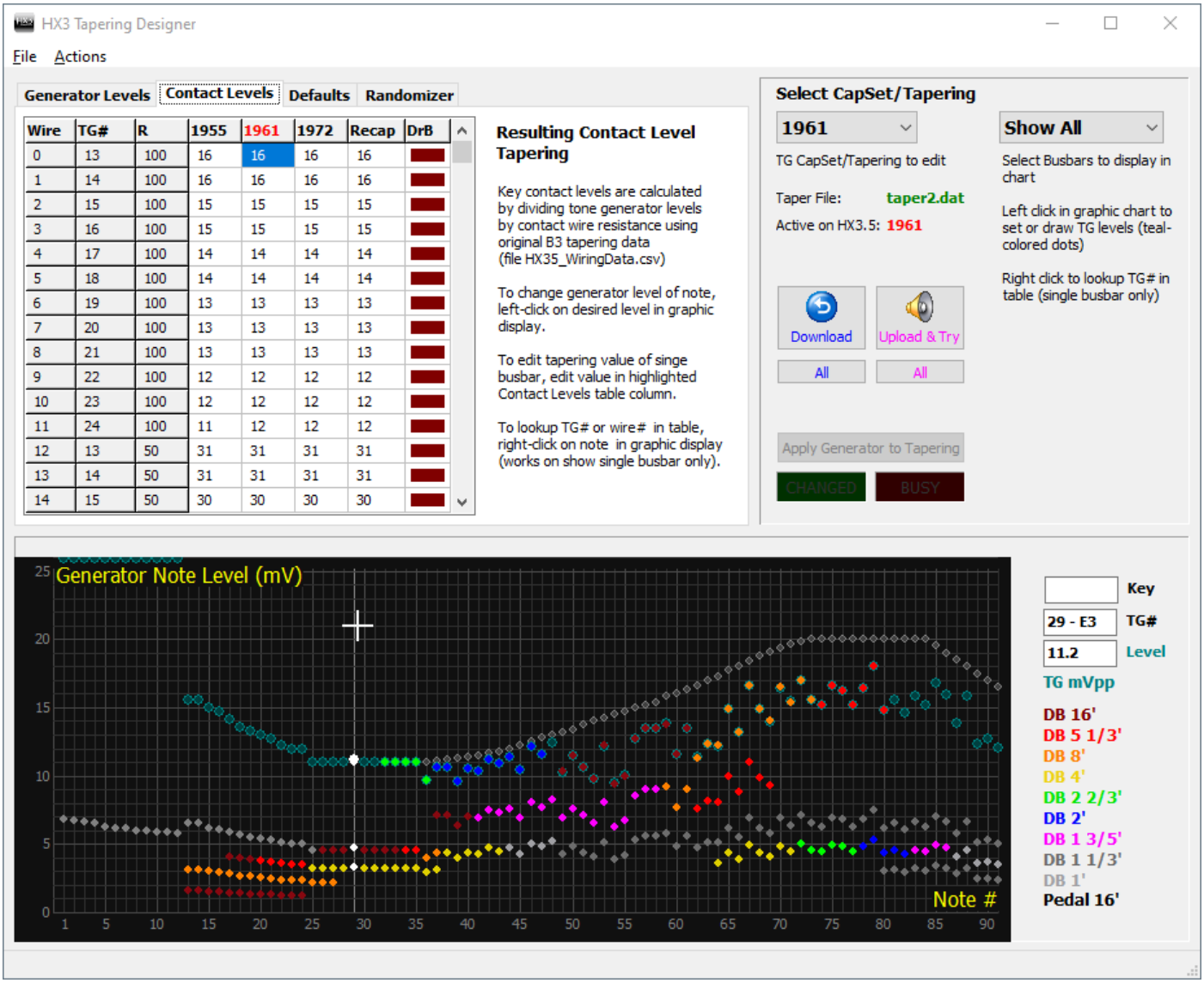
In the *File* menu, you can save a CC Set in .dat format from the editor and load it into the editor. In .dat format, the CC Set can also be saved on an SD card and transferred from it to the HX3 unit.

Tapering Designer

HX3 Manager contains a sixth component, which was developed only for internal use at KeyboardPartner and therefore is not visible in the start window at first. However, for experts with special desires we would like to make the *Tapering Designer* available. **Please note:** This tool should only be used by expert users who do not need a comprehensive user manual and know exactly how tone generation and tapering works in the real thing.

Drag the bottom of the start window down with the mouse to make the *Tapering* button accessible. After launching, a window appears with the generator levels (*Generator Levels* tab, default values) of the active generator. Select the CapSet to be edited using the Select *CapSet/Tapering* drop-down menu. To retrieve the values stored on the HX3 device instead of the default values, click the *Download* button.

Attention: Older HX3 taperings (before FW #5.654) do not contain the original generator levels; the Tapering Designer tries to determine these from the contact levels. You may shift the levels with the *Generator Levels Shift* slider in the *Defaults* tab, but it is better to create a completely new tapering (see below).



The diagram displays the levels of all 91 notes. To display the level of an individual note in the table, right-click on the desired tonewheel note in the graphic. You can change the level in the table, but also by left-clicking or left-dragging (for multiple notes) in the diagram. The gray dots represent the idealized factory calibration for orientation purposes.

Note that the levels for the "Complex Tonewheels" (notes 1 to 12) are outside the graphic display area and can only be edited in the table. Changes to the generator levels basically affect all keys connected via the tapering.

After changes, transfer the values back to the HX3 device with *Upload&Try*; you can then check your settings immediately. To save the values permanently on the HX3 device, select *Upload Single Tapering* in the Actions menu.

For archiving, you can also save the table locally on your hard disk (File menu ->*Save DAT Taper File*). The created single tapering file is saved in DAT format suitable for the *HX3 Updater* or SD card update.

Tables in text format with 91 or 96 tonewheel levels can be imported with *Import Strip mV Levels*, e.g. CSV columns created with Excel. An example of an importable file (tg_levels_textfile.txt) can be found in the *user* directory.

To display the levels after resistor wiring (i.e. directly at the key contacts), switch to the *Contact Levels* tab. All harmonics are initially displayed together here in different colors. Select an individual harmonic at the top right to display only the levels of a specific harmonic and to change them if necessary. This diagram always displays only 61 notes (keybed range). A change here or in the *Contact Levels* table has no effect on the original generator level. The *Contact Levels* are ultimately the values that HX3 uses for the overall tapering in the *taperX.dat* files.

Create new taperings

Select *Reset to Default* in the File menu and save the taperings with File->*Save All DAT Taper Files* to your *updates* directory (later if necessary). You can also upload the new taperings to the HX3 device immediately with Actions->*Upload All*.

The "randomness" of the level distribution for the *1955, 1961* and *Recap* settings is determined by the sliders in the *Randomizer* tab; the algorithm primarily affects the LC-filtered tonewheels. The 1972 setting represents the factory adjustment; no randomization occurs here. Note that changes to the sliders immediately affect all generator levels in the current column; manual changes in both the generator and contact level tables are thus lost. These must always be made after a slider setting.

To "clone" a specific tonewheel organ, you can use the CaM Tonewheel Organ Analyzer to record its tapering and transfer it to the HX3 device.

HX3 Manager on a Mac

HX3 Manager is compatible with the free Windows runtime environment **Wine.** Wine is available for MacOS 10.8 to 10.14 (not yet for Catalina at the time of publication of this guide). Here's how it works:

1) Download and install XQuartz.

2) Download "Wine Stable" and install it in default configuration (without 64-bit support).

3) Connect your HX3 system to your Mac via USB and start it.

4) Start HX3_Manager.exe by double clicking on the file icon. In the Wine dialog box that opens, confirm "Run directly in ...". The HX3 Manager app should now appear on your screen and work as intended.

Alternatively, you can use the HX3 Manager in the Wine variant **CrossOver** from Codeweavers (also for new macOS versions). The trial version runs for 14 days free of charge. Steps:

1. Create a new bottle by hovering to the CrossOver top menu "Bottle" and select "New Bottle".

2. Name your bottle, select type Window 10 and create.

3. Right click the bottle, select "open c:drive" and copy the folder HX35_Updates_xxxx or HX36_Updates_xxxx to "Program Files".

4. Click "run command" and browse for the HX3_Manager.exe and click run.

5. One the application launch click "save command as launcher" to save an icon of the application. In the future you can start the HX3 Manager with a double-click.

A DFU driver cannot be installed under Wine or CrossOver as things stand. Therefore, you cannot use the Windows version of the DFU utility. Instead, use the Mac version **DreamDFU.kbp**, which is available for download on the update server. For startup, follow the note in the attached README file.

Of course you can also set up a complete Windows environment on the Mac, for example using **Apple Boot Camp** or in a virtual machine such as **Parallels Desktop** or **VMware Fusion**.

Documents library, Download repository:
updates.keyboardpartner.de

Join the **HX3 community** at http://forum.keyboardpartner.de or HX3 Organ Users (independent Facebook user group)

KEYBOARDPARTNER UG

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