

HX3

SOUND ENGINE

User Manual

HX3.6 Manager

(preliminary, as of Version 6.00, May 2023)

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HX3.6 Manager

The Manager for HX3.6 systems is a Windows application. Installation is not required. Just unzip the file [hx36_manager_xxxx.zip](#) into a folder on your local hard disk and launch the app from the update 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:

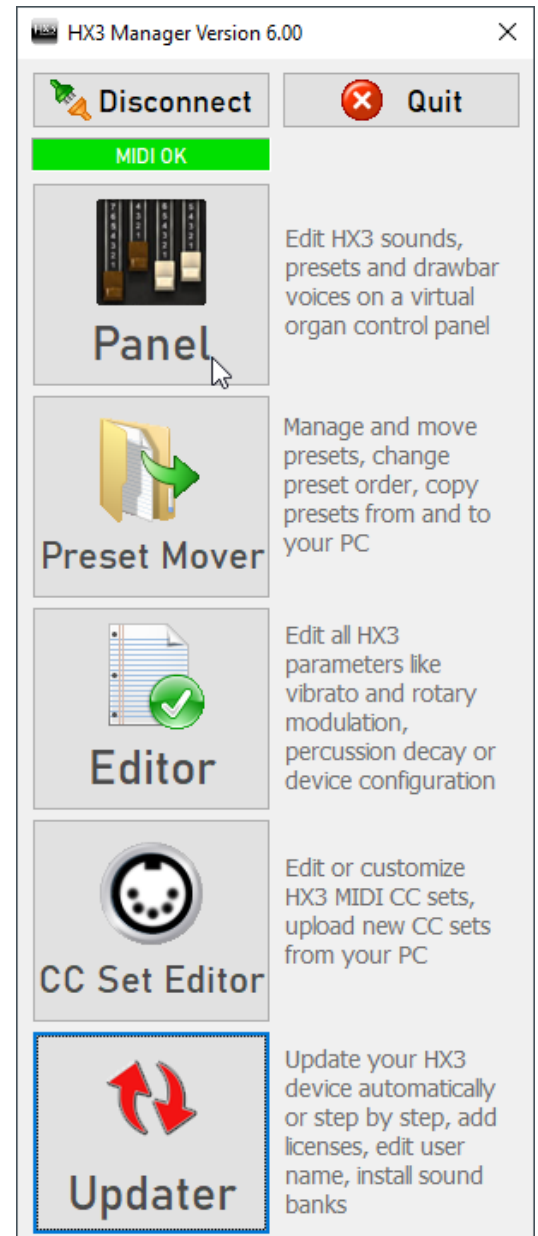
The **Panel** contains switches and drawbars for your HX3 device. In the panel window, you can adjust sounds and effects, as well as create, name, and save presets. When the panel is open, you can recall presets live using the function keys on your PC keyboard.

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 entirely in an automatic process or individual selected components. Use the Updater also to activate an Extended License or to change the user name.



In the start window of the HX3.6 Manager, click the button of the component you want to use.

The application for old HX3 versions HX3.4 Remote as well as the HX3.5 Manager are **not** suitable for HX3.6. Vice versa the HX3.6 Manager cannot handle older hardware versions.

Connecting

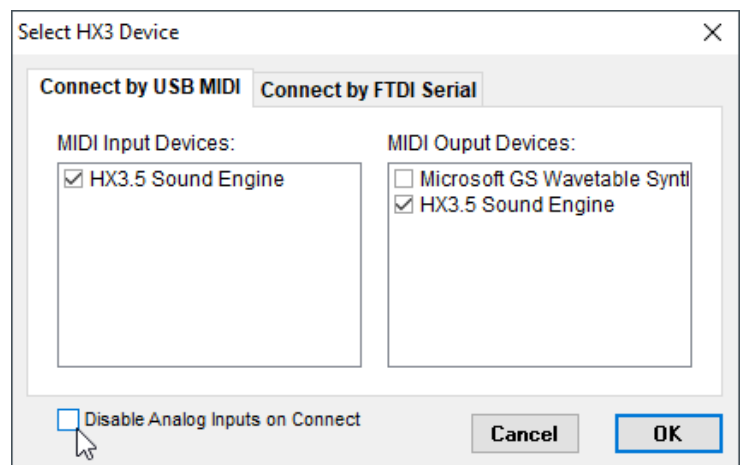
HX3 Manager can connect to the HX3 mainboard through several channels:

- Preferably through **USB** using a cable to the B-type USB jack of the HX3 device, **updates can be made through USB only**,
- 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 PL22 FTDI, black wire (BK) facing to black header PL18 SD,
- 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.

When using the USB jack, no cable must be connected to the secondary (left) MIDI input DIN jack. During an update MIDI DIN cables must be removed.

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.

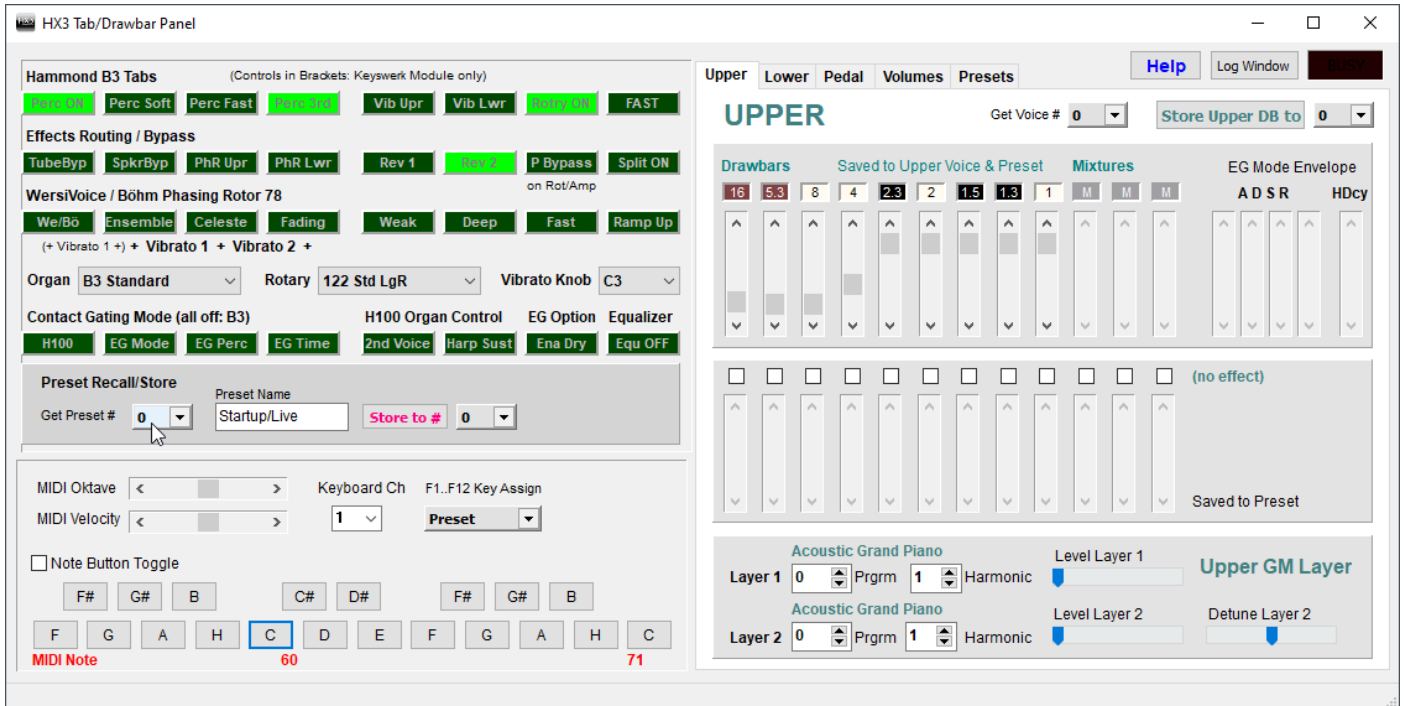


FTDI connection: Select *Connect by FTDI Serial*. Select "FT232R", "TTL232R" or similar in the device lists. Windows will automatically install the FTDI driver the first time you use it. For older Windows versions, the driver may need to be installed manually. You will find instructions for this in the 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 HX3.6 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 and name 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 HX3.6 device system can be controlled with a tablet or smartphone, see [User Manual HX35 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.

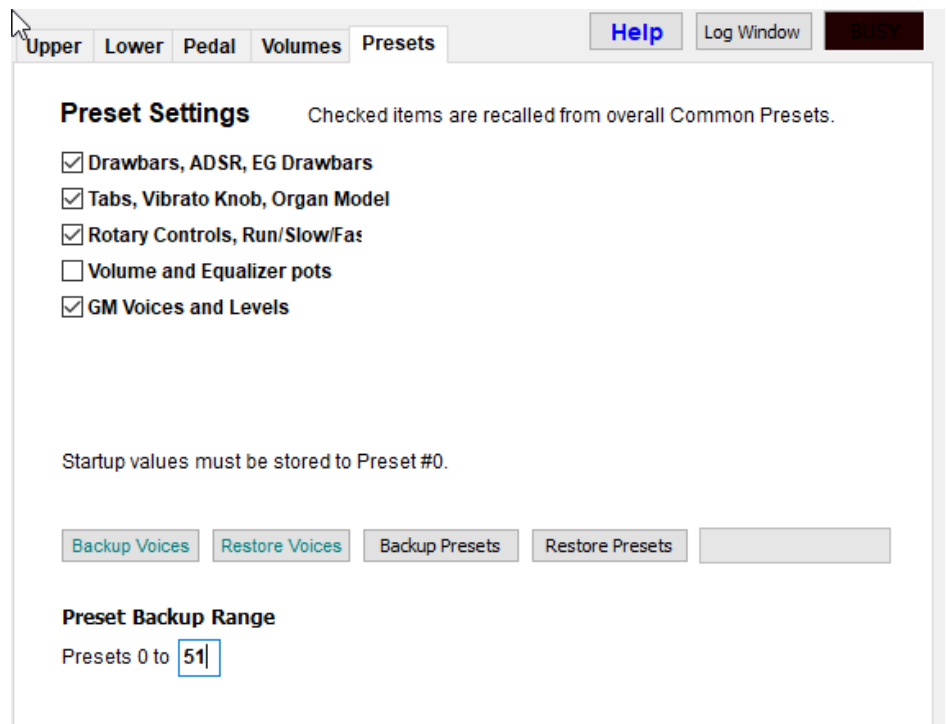
Saving Presets to the HX3 device

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.

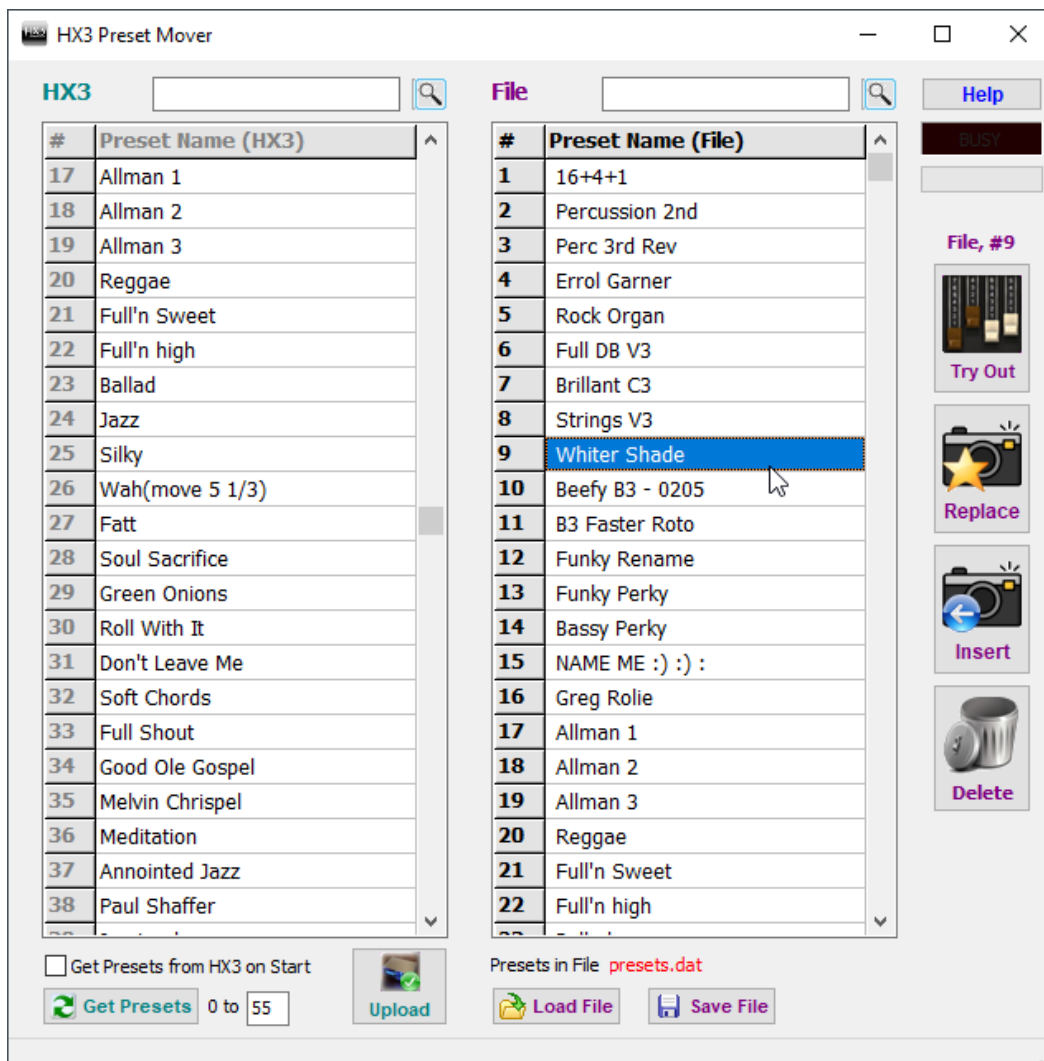
Items that checked will be stored individually with single presets. Items that are not checked will be stored in preset #0 as default values and thus be valid for all presets.



Preset Backup and Restore

Use the respective buttons to backup or restore presets or voices. If you do not use all 99 presets, you may speed up the backup procedure by limiting the number of presets that are written to the backup file on the Presets Panel. 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

Param #	Description	Value
Upper Drawbars		
1000	DB #0, Upper Drawbar 16	120
1001	DB #1, Upper Drawbar 5 1/3	127
1002	DB #2, Upper Drawbar 8	127
1003	DB #3, Upper Drawbar 4	86
1004	DB #4, Upper Drawbar 2 2/3	13
1005	DB #5, Upper Drawbar 2	3
1006	DB #6, Upper Drawbar 1 3/5	0
1007	DB #7, Upper Drawbar 1 1/3	0
1008	DB #8, Upper Drawbar 1	0
1009	DB #9, Upper Mixture Drawbar 10	0
1010	DB #10, Upper Mixture Drawbar 11	0
1011	DB #11, Upper Mixture Drawbar 12	0
Upper ADSR		
1048	DB #48, Upper Attack	21
1049	DB #49, Upper Decay	83
1050	DB #50, Upper Sustain	127
1051	DB #51, Upper Release	24
1052	DB #52, Upper ADSR Harmonic Decay	63
Upper GM Synth		
1224	Upper GM Layer 1 Voice	0
1225	Upper GM Layer 1 Level	0
1226	Upper GM Layer 1 Harmonic	1
1227	Upper GM Layer 2 Voice	0
1228	Upper GM Layer 2 Level	0
1229	Upper GM Layer 2 Harmonic	1
1230	Upper GM Layer 2 Detune	7
Upper Electronic Gating Percussion Drawbars		
1096	DB #96, Upper Env/Perc Drawbar 16	0
1097	DB #97, Upper Env/Perc Drawbar 5 1/3	0
1098	DB #98, Upper Env/Perc Drawbar 8	0
1099	DB #99, Upper Env/Perc Drawbar 4	0
1100	DB #100, Upper Env/Perc Drawbar 2 2/3	0

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.**

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 move to the top of the table, and will be marked as active by green parameter numbers.

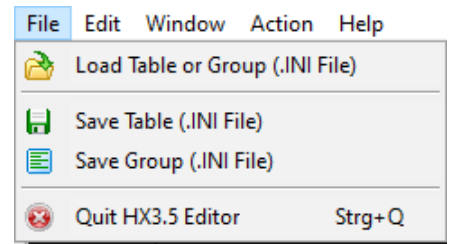
When you change values, they take effect immediately but are not stored. Click *Store Defaults* to permanently transfer all values from the table to the HX3 device.

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*.

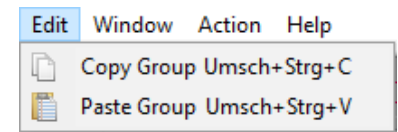
Use this function to create a backup of the parameter values before you change settings so that you can revert to the old values if necessary.

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

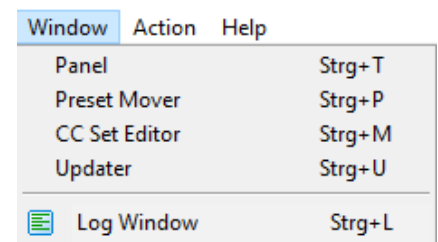
In the *Edit* menu, you can use the *Copy* function to copy the values of a parameter group to the clipboard. With the *Paste* function you can paste the values from the clipboard into the currently activated parameter group. This function should be used with caution. The editor does not check whether the copied values make sense.



Window Menu

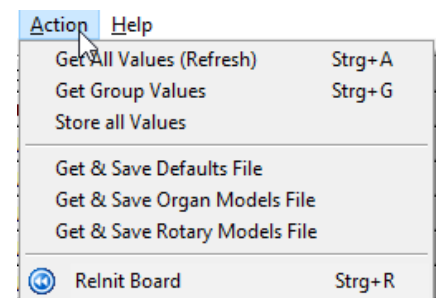
From the *Window* menu, just as from the Start window, you can call the Panel, Preset Mover, CC Set Editor and Updater components, optionally using keyboard shortcuts when the Editor window is open.

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 All Values* parameter values 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. *Relnit 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*: displayed values changeable in the editor.

#1264 Rotary Knobs/Switches: displayed values changeable in the editor.

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

Preferences

#1272 Busbar Levels, Hammond (Default)

#1353 Keyboard Settings

#1368 MIDI Settings

#1384 Organ Setup (Current Generator)

#1480 Percussion Setup

#1448 Rotary Control, #2104 **Rotary Simulation Inits**, **Rotary Simulation LFO Phase Inits**

#1400 Reverb Settings, #2000 **Reverb DSP Setup**

#1498 GM/Piano/H100 Setup

#1320 Scanner Vibrato Setup (active Generator): Momentary values, depending on the selected organ model, are taken from the following setup data.

#2200 ScannerVib Program Setup B3 default, B3 old, M3/M100, *H100, LSI Sine, LSI Square, Conn SNG, Combo*

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

#2500 PHR Program 0 ... 7 Setup

#1496 Board Inits (System Inits)

#1288 Current Busbar Note Offsets: Momentary values, nothing to adjust.

#2700 BB Note Offsets all Generators, *H100, LSI Sine, LSI Square, Single Note, Combo*

#1416 Current Mixture Levels: Momentary values, are taken from the following setup data, depending on the setting.

#2800 Mixt Lvl Setup for Drawbar 10, 11, 12, in each case for *H100, LSI Sine, LSI Square, Single Note, Combo*

#3000 Pedal Drawbar Factors 16, 16H, 8', 8H

#3524 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, Ext Panel 0, Ext Panel 1, onboard, Ext Panel 3, Ext Panel 4, Ext Panel 5

#5200 Button or Switch Select, ExtPanel 0, ExtPanel 1, onboard, ExtPanel 3, ExtPanel 4, ExtPanel 5

#5300 XB2 Button Input Assigns/Remaps

Parameters on the menu panel

#6000 Menu Enables Part 1, Part 2, Part 3

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
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.

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 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.

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).

Editing Organ Models

The screenshot shows the HX3 Editor Version 6.00 interface. On the left is a table of parameters, and on the right is the 'Organ Models' editing panel.

Param	Description	Value
1000	DB #0, Upper Drawbar 16	24
1001	DB #1, Upper Drawbar 5 1/3	127
1002	DB #2, Upper Drawbar 8	127
1003	DB #3, Upper Drawbar 4	86
1004	DB #4, Upper Drawbar 2 2/3	0
1005	DB #5, Upper Drawbar 2	0
1006	DB #6, Upper Drawbar 1 3/5	0
1007	DB #7, Upper Drawbar 1 1/3	0
1008	DB #8, Upper Drawbar 1	0
1009	DB #9, Upper Mixture Drawbar 10	0
1010	DB #10, Upper Mixture Drawbar 11	0
1011	DB #11, Upper Mixture Drawbar 12	0
#	Upper ADSR	
1048	DB #48, Upper Attack	21
1049	DB #49, Upper Decay	83
1050	DB #50, Upper Sustain	127
1051	DB #51, Upper Release	24
1052	DB #52, Upper ADSR Harmonic Decay	63
#	Upper GM Synth	
1224	Upper GM Layer 1 Voice	0
1225	Upper GM Layer 1 Level	0
1226	Upper GM Layer 1 Harmonic	1
1227	Upper GM Layer 2 Voice	0
1228	Upper GM Layer 2 Level	0
1229	Upper GM Layer 2 Harmonic	1
1230	Upper GM Layer 2 Detune	7
#	Upper Electronic Gating Percussion Drawbars	

The right panel, titled 'Organ Models', has tabs for 'Board Defaults', 'Organ Models', 'Rotary Models', and 'Input Monitor'. The 'Organ Model Recall/Store' section shows a dropdown menu set to 'B3 Standard', with 'Refresh' and 'Store to Organ Model' buttons. Below this are buttons for 'Keybed Params', 'Organ Setup', and 'Knobs'. A vertical label 'Jump to Parameters in Table' is on the left. The 'Organ Model Parameters' section includes 'Volume Pots', 'Scan/Vib Setup', 'Perc Setup', 'GM/H100 Setup', 'Busbar Levels', 'Busbar Offsets', and 'Mixture Setup'. A legend indicates: 'Values stored to selected Organ Model' (magenta), 'Values stored to Startup/Board Defaults' (green), and 'Values stored to Preset' (blue). A note at the bottom states: 'HX3.6 has 16 pre-defined organ models which may be edited here. Select Organ Model to edit and click "Refresh". Set Organ Model parameters (coloured magenta) according to taste. Click "Store" to make changes to selected organ model permanent.'

HX3.6 provides four organ models, with Extended License 16 organ models. 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

Param #	Description	Value
Rotary Simulation Inits		
2104	Input Level of Rotary Sim	193
2105	Horn Level	191
2106	Rotor Level	238
2107	Near Reflections Level (Horn)	200
2108	Far/Room Reflections Level (Horn)	170
2109	Speaker Crossover Freq (50 = nom. 800 Hz)	50
2110	Throb Highpass Frequency Rotor	20
2111	Room Initial Delay (64 = 10ms)	80
2112	Diffusor Delay Horn (Near, 255 = 1.3ms)	35
2113	Diffusor Delay Horn (Room)	84
2114	Diffusor Delay Rotor (Near)	45
2115	Diffusor Delay Rotor (Room)	135
2116	LFO Mod Horn Main Left	180
2117	LFO Mod Horn Main Right (= Left)	180
2118	LFO Mod Horn Refl 1 Left Near +Cab 4x	170
2119	LFO Mod Horn Refl 1 Right Near (= Left)	170
2120	LFO Mod Horn Refl 2 Left Far	175
2121	LFO Mod Horn Refl 2 Right Far (= Left)	175
2122	LFO Mod Horn Throb Left 2 kHz	200
2123	LFO Mod Horn Throb Right 2 kHz (= Left)	200
2124	LFO Mod Horn Cab 4x	125
2125	LFO Mod Rotor Main	175
2126	LFO Mod Rotor Refl	170
2127	LFO Mod Rotor Throb	155
2128	(RFU)	0
Rotary Simulation LFO Phase Inits		

Board Defaults Organ Models **Rotary Models** Input Monitor

Rotary Model Recall/Store
 Leslie 122 Std, small room Refresh Store to Rotary Model
 Save as File

Jump to Parameters in Table

Rotary Setup Rotary Model Parameters
 Rotary Control Amp Tube Parameters

Values stored to selected Rotary Model
 Values stored to Startup/Board Defaults
 Values stored to Preset

HX3.6 has 16 pre-defined Rotary Models which may be edited here. Select Rotary Model to edit and click "Refresh". Set Organ Model parameters (coloured brown) according to taste. Click "Store" to make changes to selected Rotary Model permanent.

HX3.6 provides four rotary models, with Extended License 16 rotary models. 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.

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 matching your device.

Param #	Description	Value
Board Inits		
1496	(not used)	0
1497	Vibrato Knob Mode	2 <input type="checkbox"/> Vibrato on 4 Radio Btns
1498	CommonPreset Save/Restore Mask	23 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
1499	(not used)	0
1500	(not used)	0
1501	Various Configurations 1	20 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
1502	Various Configurations 2	1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
1503	ADC Configuration	1 <input type="checkbox"/> Swell ADC only
1504	1st DB Set Voice Number (enabled when 0..15)	0
1505	2nd DB Set Voice Number (enabled when 1..15)	40
1506	Pedal Drawbar Configuration	0 <input type="checkbox"/> 2 Pedal DBs (B3)
1507	ADC Scaling	100 <input type="checkbox"/>
1508	(not used)	0
1509	HX3.5 Device Type	1 <input type="checkbox"/> MIDI Expander
1510	Preset/EEPROM Structure Version	60
1511	Magic Flag	165

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 HX3.6 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.

1496 2ndDB Select Voice Number. Selecting this voice # on a manual (menu or Preset16/Preset12-2 connected to inverted keys) will turn on second drawbar set

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 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).

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

Each analog and switch input of the HX3 mainboard can be assigned to (almost) any function. The connector assignment can be found in the [HX3.6 installation manual](#).

The 24 internal analog inputs (PL31, PL32) can be expanded to a total of 88 inputs (24 internal, 64 external) by DBX and PTX boards on PL27; mixed operation of the older DB9 and DB12 boards and the DBX and PTX boards is also possible.

The 16 internal pushbutton/switch inputs (PL35/PL36) can be extended to a maximum of 64 switch inputs via up to 3 Preset16 or Extend16 boards jumpered as external panels. These are connected in series to PL26 via a I²C bus system.

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](#).

Assigning analog inputs

Two groups are available for assigning the analog inputs: For the internal inputs at PL22 and PL23 the parameter group 5000 to 5023 (Analog Input Assignment/ Remap), for the external MPX inputs at PL27 the parameter group 5024 to 5087 (Analog MPX Input Assignment/Remap).

Call up the assignment table 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).

For example, parameter 5009 has the function "Master Volume"

assigned to 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.

Set unused inputs to "254 Not Assigned", these are skipped during the query and may then also 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.

Param	Description	Value
#	Analog Input Assignment/Remap	
5000	Analog Input 0 (UPR PL22-1) Function	0 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

If one of the table groups is not to be used at all because only internal (PL31, PL32) or only external (MPX PL27) inputs are used, set the first entry of the unused group to "255 End of Assign Table". For example, if only DBX and PTX boards are connected to MPX PL27, set parameter 5000 to "255 End of Assign Table". If no DBX or PTX boards are used, set entry 5024 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 PL31/PL32 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. For the 16 inputs at PL35/36 there is the subgroup *Switch Remap Onboard*. With the parameters *Input Mode* or *Input Mode Onboard* you specify whether the inputs are switches (value ON) or pushbuttons (OFF).

Param #	Description	Value
Button/Switch Input Assigns, onboard		
5132	Input 32 (onboard Pin PL25-1) Function	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

Input Monitor

The screenshot shows the 'Input Monitor' tab in a software editor. On the left is a list of assignable functions. The main area contains two tables: 'Digital Input Monitor' and 'Analog Input Monitor'. Below the tables are checkboxes to activate the monitors.

Digital Input Monitor for PL35/PL36 (Panel16) and external Preset16/Extend16
 Top Btn Row on Panel16/Preset16 Bottom Btn Row on Panel16/Preset16

Panel/Input	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0 extern \$60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1 extern \$61	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2 onboard \$62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3 extern \$63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4 extern \$64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5 extern \$65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Analog Input Monitor for PL31/PL32 (Upper/Lower) and MPX Inputs

0	1	2	3	4	5	6	7	8	9	10	11	ADC Input
77	73	69	66	62	60	57	55	48	47	46	45	Upper (PL31)
42	42	41	41	37	37	36	36	34	35	35	35	Lower (PL32)
35	37	38	40	41	42	43	44	--	--	--	--	+0 (MPX PL27)
46	47	47	49	50	50	52	52	--	--	--	--	+8
53	54	55	55	56	57	57	58	--	--	--	--	+16
58	59	60	60	61	61	61	62	--	--	--	--	+24
62	63	64	64	64	65	65	65	--	--	--	--	+32
66	65	66	67	66	67	67	67	--	--	--	--	+40
67	68	68	68	68	68	69	69	--	--	--	--	+48
69	69	69	69	70	69	70	70	--	--	--	--	+56

Click on entry to show Remap assignment in table
 Shift-Click on entry to show assigned parameter in table

Activate Digital Input Monitor
 Activate int. ADC Monitor (raw) Activate MPX ADC Monitor (raw)

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 PL31 and PL32 (internal) connectors located on the HX3 board or the components connected via the MPX bus PL27. 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.

If you want to make further changes, call up the respective group of menu entries again and repeat the steps described.

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

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 HX3.6 device. To do this, set the device to DFU mode, start the app and select the update file for your device from the "update" directory. The updater 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 **Update!**. The updater puts the device into DFU mode and transfers the appropriate DFU package. The connection via MIDI over USB will be disconnected.

Exit the DFU mode after successful transmission by a restart. Afterwards you can re-establish the connection to the HX3.6 Manager via *Connect*.

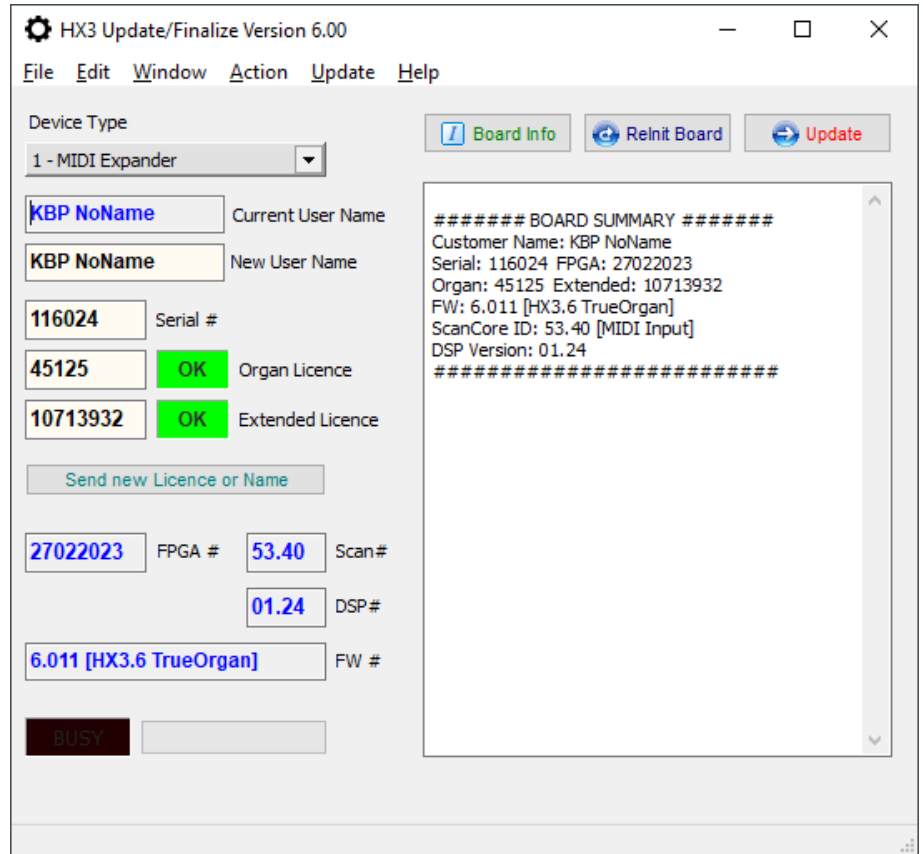
In the text field on the right the "Board Info" of the connected HX3 device appears. Here you can read the name of the user, the serial number of the HX3 mainboard, the license keys for "Organ" and "Extended" as well as the version numbers of the active parts of the operating software. The user name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

The Updater is needed to install individual components of the operating software, such as a different scan driver after a change of configuration.

If you only want to update your HX3 device, you can safely skip the rest of this chapter.

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 occurred 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 appropriate **Scan Driver** installed? Should be either MIDI Input for HX3 MIDI Expander and HX3 Drawbar Expander FW), or FatarScan or Scan16/61 driver for other configurations. You may replace the Scan Driver by using the Updater (see section "Firmware Updates" below).
- 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.

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 "[HX3.6 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.

Updates of single firmware components

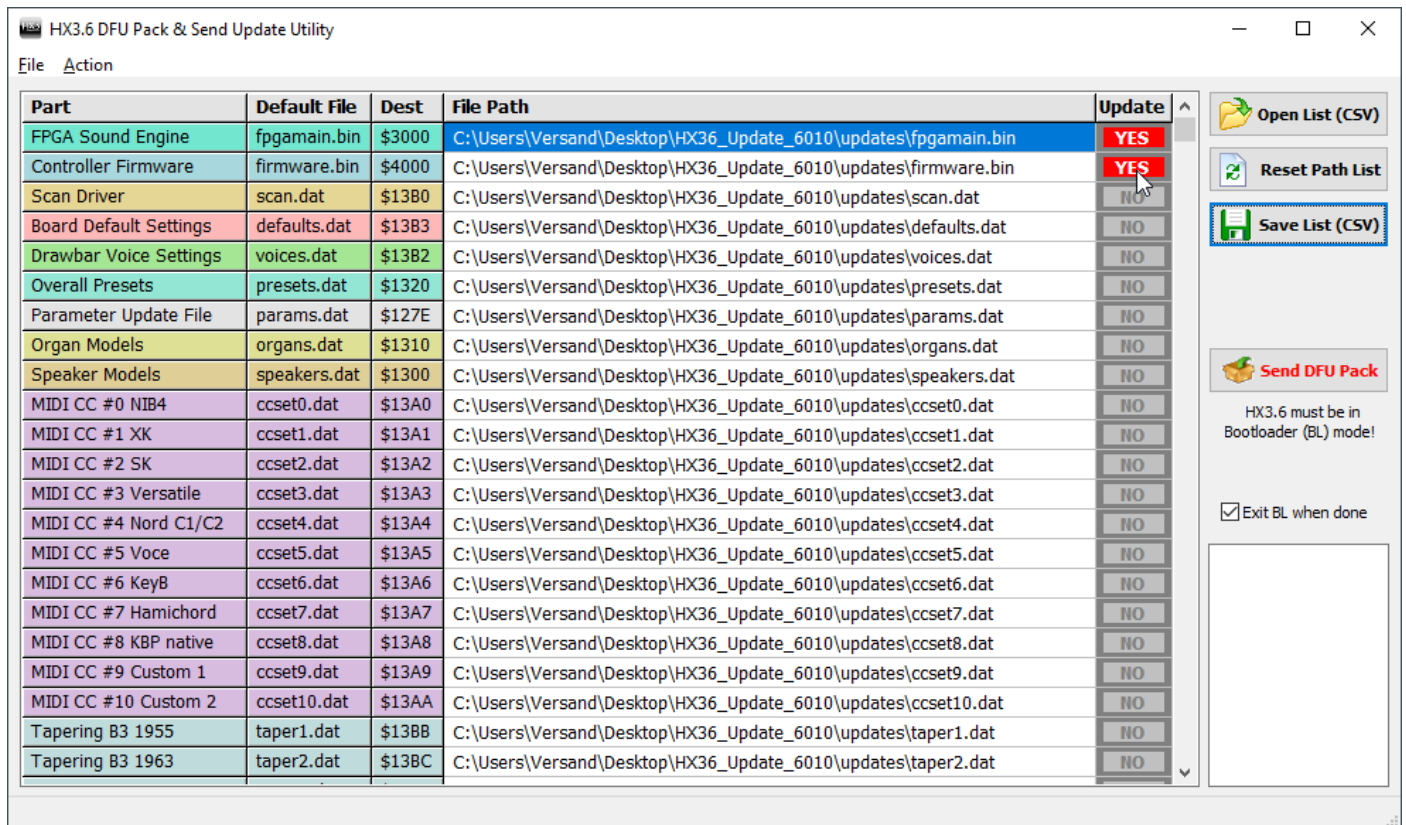
Updates for HX3 consist of several parts:

- 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).

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 update server for details which files are to be updated since last commit.

To perform an update of individual 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 (indicated on the menu panel), re-establish the connection via MIDI over USB via *Connect*.

With CrossOver and Wine under MacOS this function is unfortunately not usable, because these environments do not allow to install the required DFU driver. Use the DreamDFU_kbp app instead.

Some components can also be transferred to the HX3.6 device using the *Update via USB or FTDI cable* function from the *Update* menu. Since this transfer method is slow and less secure, it is only offered for smaller components. This function can also be used with CrossOver and Wine under MacOS.

CC Set Editor

Param #	HX3	Channel	CC	min.	max.	Value Mode	NRPN
Upper Drawbars							
1000	DB #0, Upper Drawbar 16	1	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	

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 via MIDI CCs. Set the MIDI channel under Channel and the CC numbers under CC according to the MIDI implementation table of your keyboard. 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.

If a CC number is assigned twice, a warning message will appear. For some functions, however, it may be useful to use the same CC number more than once, for example, for a chorus/vibrato rotary switch. Here, the function is then determined more precisely based on the received data value. This setting option can be found under "Special Range Functions" at the bottom of the table. Otherwise, each CC number can only be used for one function.

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.

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.
- *Ignore out of range* Values outside the set range are ignored.
- *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 when 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.

Press the *Try Out* button to transfer all settings to the HX3 device for testing. These are stored in RAM, but not yet permanently saved.

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.... 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 from the Editor as a .csv file and load it into the Editor from a .csv file. You can also save and load a CC Set in .dat format. In .dat format, the CC Set can be saved on an SD card and transferred from the SD card to the HX3 system.

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).

Generator Levels | **Contact Levels** | Defaults | Randomizer

Wire	TG#	R	1955	1961	1972	Recap	DrB
0	13	100	16	16	16	16	■
1	14	100	16	16	16	16	■
2	15	100	15	15	15	15	■
3	16	100	15	15	15	15	■
4	17	100	14	14	14	14	■
5	18	100	14	14	14	14	■
6	19	100	13	13	13	13	■
7	20	100	13	13	13	13	■
8	21	100	13	13	13	13	■
9	22	100	12	12	12	12	■
10	23	100	12	12	12	12	■
11	24	100	11	12	12	12	■
12	13	50	31	31	31	31	■
13	14	50	31	31	31	31	■
14	15	50	30	30	30	30	■

Resulting Contact Level Tapering

Key contact levels are calculated by dividing tone generator levels by contact wire resistance using original B3 tapering data (file HX35_WiringData.csv)

To change generator level of note, left-click on desired level in graphic display.

To edit tapering value of single busbar, edit value in highlighted Contact Levels table column.

To lookup TG# or wire# in table, right-click on note in graphic display (works on show single busbar only).

Select CapSet/Tapering

1961

TG CapSet/Tapering to edit

Taper File: **taper2.dat**

Active on HX3.5: **1961**

Download | Upload & Try

All | All

Apply Generator to Tapering

CHANGED | BUSY

Generator Note Level (mV)

25
20
15
10
5
0

1 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90

Note #

Key

29 - E3 TG#

11.2 Level

TG mVpp

DB 16'

DB 5 1/3'

DB 8'

DB 4'

DB 2 2/3'

DB 2'

DB 1 3/5'

DB 1 1/3'

DB 1'

Pedal 16'

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.

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 HX3.6 system to your Mac via USB and start it.
- 4) Start HX36_Manager.exe by double clicking on the file icon. In the Wine dialog box that opens, confirm "Run directly in ...". The HX3.6 Manager app should now appear on your screen and work as intended.

Alternatively, you can use the HX3.6 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 HX35_Updates_xxxx folder into "program files".
4. Click "run command" and browse for the HX36_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 HX3.6 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

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