HX3

SOUND ENGINE

User Manual

HX3.7 Sound Module Pro

with Extended License

(as of firmware version 7.053, November 2025)

keyboardpartner.com

Please read this manual carefully before using the HX3 Sound Module.

Only use appropriate power supply as advised. Input voltages exceeding 15V may damage the device.

Designed for indoor use only. Do not use HX3 Sound Module in moist places. Do not spill liquids or solvents into unit.

No user-serviceable parts inside. Refer to qualified technician or service representative if problems occur.

Only clean with damp soft cloth. Using detergents or solvents may deteriorate finish and lettering.

Keep packaging in case of service shipment.

EU conformity declaration

The producer/distributor

KEYBOARDPARTNER UG

Entwicklung elektronischer Musikinstrumente
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hereby declares, that the product

HX3.7 Sound Module Pro

has been designed, produced and examined in compliance with the DIN VDE 0580 standard and in accordance with the EU Low Voltage Directive.

Following directives, standards and guidelines have been used:

EMV-Richtlinie 2014/30/EU
Niederspannungsrichtlinie 2014/35 EU

RoHS-Richtlinie 2011/65/EU

Langenhagen, February 2025

Carsten Meyer / Geschäftsführer

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HX3.7 Sound Module Pro

HX3.7 Sound Module Pro is a tonewheel emulator with all the features of a classic electromagnetic organ. It is controllable via MIDI with selectable and editale CC sets for various keyboards. Additional CC sets are loadable.

HX3 offers unlimited polyphony, 100 presets, 3 x 15 drawbar presets and CaM rotor simulation with rotary speaker, scanner vibrato and amp 122. General MIDI sounds such as piano and strings are also available.

In addition to the B3, the HX3 RealOrgan sound generator optionally (with the Extended License) can emulate other organs, including the famous H100, plus combo organs and concert organs from the 70s and 80s such as the Böhm Orchestra and Wersi Helios. This implies up to 15 harmonics, up to 12 drawbars per manual with individual mixtures, including phasing rotor (WersiVoice). An ADSR envelope is available on all drawbars, also H100 percussion and "Harp Sustain". Various tone generator waveforms are selectable, for "cheesy" combo organs as well as fully fledged concert organs.

Features

- Compact organ emulator in aluminum box, 483 mm x 165 mm x 45 mm
- Authentic reproduction of generator. Key contacts, percussion, rotary effect, scanner vibrato and TubeAmp realized using physical modeling in pure hardware.
- Extremely low internal latency of 50 microseconds Key-to-Audio. However, MIDI transmission delay is about 1 ms per note played.
- Natural key click due to 9 (B3 mode) or 12 (H100 mode) contacts closing in succession
- Authentic ‘CaM Rotor’ simulation with 122 tube amp
- Predefined, editable organ models and rotary models
- General MIDI (GM) Synth, 54x polyphonic
- Tunable in range of A = 433 through 447 Hz
- Effects DSP with 3 reverb levels
- Dual MIDI IN for two keyboards or bass pedal, MIDI OUT, swell (expression) pedal and footswitch jacks
- 11pin connector for external Leslie®
- USB for MIDI over USB, firmware updates, parameter editing
- Made in Germany

Default MIDI setting: channels 1/2/3 for upper/lower/bass, MIDI CC HX3.5/KBP.

DC input 9 to 12V, 500 mA min., 5.5/2.1 mm plug, plus on center.

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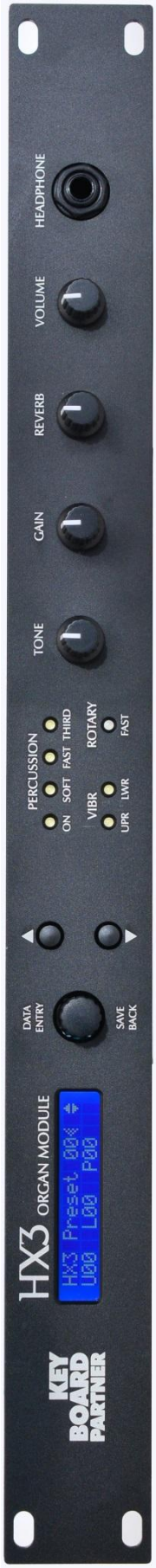
Front Panel



Headphone output, connected in parallel to the headphone output on the rear panel.

Master volume for all outputs including headphones. Can also be controlled via MIDI CC #7 “Volume”, the last action is always effective.

Reverb Level. Can also be controlled in the MIDI CC set “HX3/KBP” via MIDI CC #41 on MIDI basic channel +1, the last action is always effective.

Gain controls the distortion level of the internal tube amplifier simulation. Can also be controlled via MIDI CC #8, the last action is always effective.

Tone control, corresponds to the classic tone control of the AO28 preamp.

You can freely assign the functions of the potentiometers with the HX3 Manager.

Indicator LEDs for percussion, vibrato, rotary simulation.

Menu control buttons. The down button leads to the submenu of the respective function group, the up button leads back to the main menu. Simultaneous panic buttons for switching off the sound generation.

Rotary encoder for navigating the menu, entering values (press once) and saving (press and hold for 2 seconds).

HX3 start menu. To select from 100 common presets, press the rotary encoder briefly and then turn it. Press again to return to navigation.

To select each of the 16 voices (drawbar presets), navigate to U00, L00 or P00 by turning the rotary knob. Press the rotary knob briefly and then turn it to select the desired voice. Press again to return to the navigation

Back Side

EXT LESLIE: 11pin connector for external Leslie®

Headphone output (stereo)

Insert input for external effects unit, feed before rotary simulation.

Level control for insert input

Pedal audio output (mono, pure)

Organ audio output (mono, pure)

Rotary simulation audio output (stereo). Level around 300 mV at full level.

Power supply connection for stabilized DC voltage 9 -12 volts, min. 500 mA, plug with 2.1 mm pin, 5.5 mm external, positive pole is on the internal connector.

MIDI IN 1, **MIDI IN 2**, Equivalent inputs for connecting a keyboard or pedal via MIDI.

MIDI OUT, optionally switchable as MIDI THRU.

USB-B port for MIDI over USB and firmware updates. USB port and MIDI IN 2 must not be used at the same time.

Foot switch socket for rotary control. SLOW/FAST is on the tip of the connector, RUN/STOP on the ring. Configured for switches by default, can be configured for buttons (parameter #1502, set bit 0 to 0).

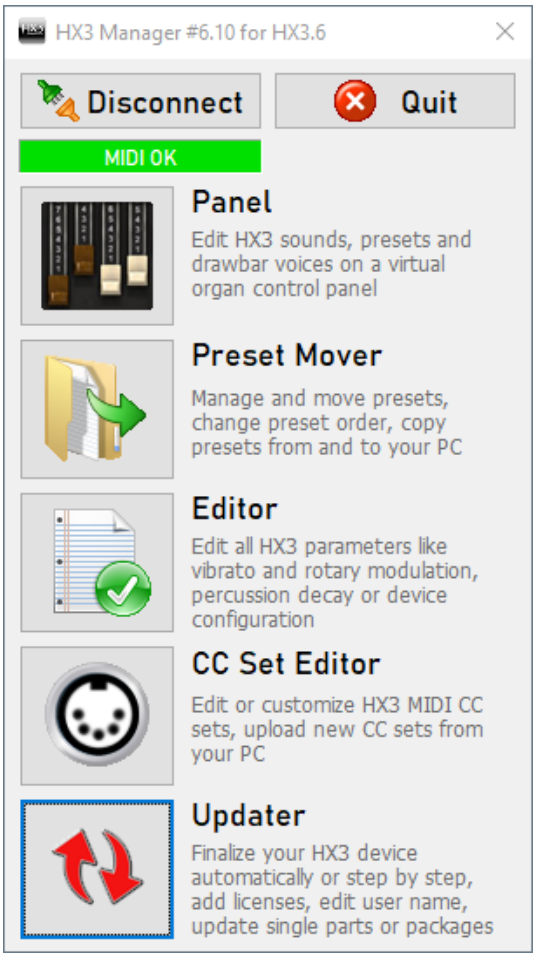
Foot swell socket compatible with Yamaha FC7 or similar, can be jumpered internally for Hammond swell pedal. Can also be controlled via MIDI CC #11 “Expression”, the last action is effective.

HX3 Apps and Tools

The following chapter describes how you can control the HX3 device completely via the menu panel. However, there are other, more convenient options: Use the Panel in the HX3 Manager for operation via PC or notebook. Use TouchOSC for operation via tablet or smartphone.

HX3 Manager

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, 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. It lets you try out, move, and rename presets. You can transfer presets from a file to the HX3 device or save them to a file.

The **Editor** lets you set up the HX3 for all conceivable hardware configurations, gives you access to all available parameters, and lets you fine-tune sounds and effects.

With the **CC Set Editor** you can edit the MIDI CC Sets of the HX3, create CC Sets or load them from a file from your PC. This allows you to get the most out of your keyboard controller, 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 username.

TouchOSC for HX3

Control your HX3 device via tablet or smartphone with the TouchOSC mk1 app from Hexler, which you can get for a few euros in the Apple App Store or Google Play. For wireless connection of iOS or Android mobile devices, the optional WiFi interface for plugging onto the HX3 mainboard is required. Wireless control is only possible when the HX3 Manager is not connected. iOS devices can also communicate with TouchOSC via MIDI over USB.

Menu Panel

After power on the **Preset/Drawbar Menu** is present. Pressing the rotary knob twice briefly will let you return to the home position from any other menu position.

Turn the rotary knob to scroll through the menu. A hatched arrow indicates the menu position. **Press the rotary knob once to edit a parameter value**. A white arrow indicates the selected entry that may be altered. Turn the rotary knob to change that value. Press the rotary know once again to continue scrolling through the menu.

In the preset/drawbar menu the rotary knob selects the **Presets 0 … 99**. Presets consist of drawbar settings and optionally tab switch settings (percussion, vibrato etc., including rotary Run/Fast/Slow), volume and 122 tube amp gain as well as all other effects.

Scroll downwards (= turn the rotary knob clockwise) to the drawbar presets (**Voices**) for **U**pper manual, **L**ower manual, and **P**edal. The top display line shows the drawbar positions as numbers from 0 – 8.

Scroll down one more step to get to the **Master Volume** setting. Master Volume adjusts the overall volume for all outputs. Higher values are recommended for the best signal to noise ratio.

Scroll down to the **TubeAmp Gain** setting. TubeAmp Gain sets the internal tube amp simulation.

Saving settings

Parameter values tagged by the letter **C** are part of a single preset. Values tagged by **D** apply to all presets and are stored as **defaults**. The assignment can be changed in the editor of the HX3 Manager with parameter #1498 or on the Presets page of the Manager's Panel.

Values tagged by **U**, **L**, or **P** are part of the current voice for upper, lower, or pedal. These are saved as Voice (Drawbar settings only) if you save them while one of these markers is displayed.

An asterisk appears at the bottom right of the display when a value has been changed. To save the setting, keep the rotary knob pressed until one of the following prompts appears on the display:

- "Saved Defaults done" for default values.
- "Save to Preset #XX" for presets ("XX" stands for the number of the currently active preset). Change the number as desired and press the knob again.
- "Save UpperDbV to #XX", "Save LowerDbV to #XX" or "Save PedalDbV to #XX" ("XX" stands for the number of the currently active Voice). Change the number as desired and press the knob again.

Menu Overview

From the HX3 menu you can access all control functions, such as rotary speed, percussion, chorus/vibrato. You can select organ models and rotary models. You can adjust many sound-defining parameters. You can create and recall Common Presets and Voice Presets (drawbar settings only). You can perform updates of the operating software, even without the HX3 Manager.

Important to know:

The HX3 menu is arranged in **function groups** and has two levels: The **main menu**, shown here in green, contains the operating functions that are used frequently. In the **submenu** of the respective function group, shown in blue, you will find parameters that are used less frequently, usually the pre-settings.

Press the lower button to switch from a **main menu** to a **submenu**. An "S" symbol then appears at the bottom right of the display. Press the upper button to return to the **main menu**.

Turn the rotary knob to navigate through the menu. Press the rotary knob briefly to change a setting. Briefly press the rotary knob again to navigate further.

The menus are arranged in a ring. The last menu item in the list is therefore followed by the first again when you scroll down further, and the same applies vice versa.

Some menu items are only available with the ***Extended License***. These are shown in *italics* in the following overview. It also depends on which organ model is selected (default: B3 Standard). In the overview, a light blue *H* marks menu items that only appear in H100 mode, and a red ***E*** marks menu items that are available in *EnvelopeGen (EG)* mode. Depending on the device type, some menu items are omitted or replaced by physical controls.

As of firmware version 5.637, the menu is shorter and therefore clearer than in previous versions. Rarely used parameters have been removed from the menu, but are still adjustable with TouchOSC, with the Panel or with the Editor of the HX3 Manager. Please use this method for the manifold settings in ***EG*** mode.

The editor can be used to remove other unwanted menu items from the menu or added to the menu. Please see details in the user manual HX3 Manager.

Start menu

HX3 Preset: Selection of Common Presets 00 ... 99.

Common Presets include Drawbar settings and optionally Tab Switch settings (Percussion, Vibrato etc.), Rotary Run/Fast/Slow, TubeAmpGain, and other effect settings. In the submenu item PMask, in the Editor or Panel of the HX3 Manager you can define which parameters are saved in presets. Preset 0 determines the settings when the device is switched on.

- **Edit Name:** The name of the preset can be edited in this submenu. Press the rotary knob once. Turn the knob to select the desired letter and press the knob again to save the change.
- Turn the knob to edit the next letter. Turn the rotary knob past the last digit or turn the rotary knob from the first letter to the left to navigate to the other submenu items.
- **LED Dimmer:** Brightness of the LEDs on connected control panels and on the menu panel of the HX3 MIDI Sound Module.
- **Save Defaults:** Saves all settings as default values that apply at power-up.
- **PMask:** Define the parameters that are to be saved in common presets.
- **SD File Exec:** Selection of a script file on the SD card when the SD card adapter is connected.
- **BootId Update**: Press the rotary knob for two seconds to launch the bootloader for operating software updates. HX3 performs a system reset and puts itself into a special communication mode for "Device Firmware Upgrades" (DFU mode). This interrupts the connection with the HX3 Manager.
  - **DFU upload ...** Fast and secure transfer of firmware via DFU (see chapter Updates). DFU packages can be transferred to the device using the **DreamDFU** app or **DreamDFU_kbp for macOS**. Under Windows, this is also possible with the updater of the HX3 Manager.
  - **FPGA recover from FAILSAFE** Restore the FPGA configuration from the backup copy stored in the device.
  - **FW recover from FAILSAFE** Restore the microcontroller firmware from the backup copy stored in the device.
  - **Exit update, start HX3** Exit the DFU mode with a reset, *Connect* of the HX3 Manager via MIDI over USB is then possible again.
- **WiFi Init Def:** Reset WLAN interface to factory default.
- **Preset Init:** Sets the live preset 0 to a basic B3 organ sound.

Upper Voice

U00 ... U15: Selection of the drawbar presets (voices). The upper line shows the drawbar settings as numbers from 0 ... 8. In *H100* and *EnvelopeGen* mode, three mixer drawbars are active in addition to the standard drawbars.

Voice 0 takes over the live setting of the drawbars, if present (not with HX3 MIDI Sound Module). An additional 15 settings can be stored to maintain compatibility with organs with preset keys.

- **UpperDB 16 ... UpperDB 1:** Settings of the standard drawbars for the upper manual.
- ***H E UpperDB Mix1 ... UpperDB Mix 3:*** Settings of the mixture drawbars for the upper manual. Mixtures consist of up to 3 higher harmonics with individual levels.

In ***H100 mode*** the following options are available:

- ***H H100 Harp Sustain:*** Activates the Harp Sustain Effect, 4‘ harmonics fading, polyphonic, no vibrato. Independent of 4‘ drawbar and 4‘ percussion.
- ***H H100 2nd Voice:*** Harmonics selected by *H-Perc Mask* sound continuously at full level. Percussion bypasses vibrato like on the H100. Combined with drawbar voices on vibrato and 2nd Voice activated this results in a neat chorus effect.
- ***H E H-Perc 16 … Mix 3:*** Selects harmonics for the percussion/2nd Voice circuit. Each “o”-symbol represents a harmonic from 16’ up to Mixture 3. The selected harmonic that may be activated by turning the encoder is underlined. If activated the respective “o”-symbol is filled white.

- ***H H100 PercToDry:*** Harmonics selected by *H-Perc Mask* are bypassing vibrato and phasing rotor “dry”.

In addition to the organ sounds, **General MIDI (GM) instruments** are available that can sound as layers simultaneously. To activate a GM instrument, set its level as desired. To deactivate the organ, set all drawbars to 0.

- **UpperGM Prg 1:** Selection of GM instrument by program number
- **UpperGM Lvl 1:** Level setting of GM voice
- **UpperGM Hrm 1:** Harmonic transposition of GM voice

With the *Extended License*, another sound layer can be used. This may be detuned to achieve a richer sound.

- ***UpperGM Prg 2:*** Selection of second GM instrument (overlay)
- ***UpperGM Lvl 2:*** Level setting of second GM voice
- ***UpperGM Hrm 2:*** Harmonic transposition of second GM voice
- ***UpperGM Detn2:*** Detuning of second GM voice

Lower Voice

L00 ... L15: Selection of the drawbar presets (voices). The upper line shows the drawbar settings as numbers from 0 ... 8. The set keyboard mode (mechanical or electronic keying) is also valid for the lower manual. In *H100* and *EnvelopeGen* mode three mixer drawbars become active in addition to the standard drawbars.

Voice 0 takes over the live setting of the drawbars, if present (not with HX3 MIDI Sound Module). An additional 15 settings can be stored to maintain compatibility with organs with preset keys.

- **LowerDB 16 ... LowerDB 1:** Drawbar settings for the lower manual.
- ***H E LowerDB Mix1 ... LowerDB Mix 3:*** Mixture drawbar settings for the lower manual. Mixes consist of up to 3 higher harmonics with individual levels. Unlike the original H100, HX3 also provides three mixtures for the lower manual.
- ***E EnvEna 16 … Mix 3:*** The mask determines for which harmonics the ADSR envelope becomes effective. There is no amplitude shaping for the non-activated harmonics.

In addition to the organ sounds, **General MIDI (GM) instruments** are available that can sound as layers simultaneously. To activate a GM instrument, set its level as desired. To deactivate the organ, set all drawbars to 0.

- **LowerGM Prg 1:** Selection of the GM instrument by program number.
- **LowerGM Lvl 1:** Level setting of the GM Voice
- **LowerGM Hrm 1:** Harmonic transposition of the GM voice

With the *Extended License*, another sound layer can be used. This may be detuned to achieve a richer sound.

- ***LowerGM Prg 2:*** Selection of the second GM instrument (overlay)
- ***LowerGM Lvl 2:*** Level setting of the second GM Voice
- ***LowerGM Hrm 2:*** harmonic transposition of the second GM voice
- ***LowerGM Detn2:*** Detuning of the second GM-Voice

Pedal Voice

P00 … P15: Selection of the drawbar presets (voices). The upper line shows the drawbar settings as numbers from 0 ... 8.

- **PedalDB 16, PedalDB 8:** Drawbar settings for the pedal.
- **PedalDB 16H, PedalDB 8H:** Drawbar settings for the pedal, smoother sound.
- **Pedal Release:** Changes decay time of pedal sound (often called string bass "sustain" on other organs).

In addition to the organ sounds, **General MIDI (GM) instruments** are available that can sound as layers simultaneously. To activate a GM instrument, set its level as desired. To deactivate the organ, set all drawbars to 0.

- **PedalGM Prg 1:** Selection of the GM instrument by program number.
- **PedalGM Lvl 1:** Level setting of the GM Voice
- **PedalGM Hrm 1:** Harmonic transposition of the GM voice

With the *Extended License*, another sound layer can be used. This may be detuned to achieve a richer sound.

- ***PedalGM Prg 2:*** Selection of the second GM instrument (overlay)
- ***PedalGM Lvl 2:*** Level setting of the second GM Voice
- ***PedalGM Hrm 2:*** harmonic transposition of the second GM voice
- ***PedalGM Detn2:*** Detuning of the second GM-Voice

Audio Setup

Master Volume: Sets the volume for all outputs. Higher values result in a better signal to noise ratio.

TubeAmp Gain: Sets the level of the simulated tube amplifier. The amplifier enters saturation and distorts at high values and higher swell pedal values. So the distortion level is controlled with the swell pedal as well. If *Gain Vol Compensation* is set in parameter 1501 of the editor, Gain works almost volume-neutral.

TubeAmpBypass: When ON, the rotary tube amplifier is bypassed.

The Audio Setup menu items have a common submenu:

- **Equ Bypass:** When ON, the equalizer is bypassed.
- **Bass Equal:** Bass level adjustment
- **Bass Equ Frq**: Bass filter frequency, missing if Parameter B/T is set to OFF.
- **Bass Equ Q:** Bass filter Q (bandwidth), missing if Parameter B/T is set to OFF
- **Mid Equal:** Mids level adjustment
- **Mid Equ Frq:** Mids filter frequency
- **Mid Equ Q:** Mids filter Q (bandwidth)
- **Treble Equal:** Treble level adjustment
- **Treb Equ Frq**: Treble filter frequency, missing if Parameter B/T is set to OFF.
- **Treb Equ Q:** Treble filter Q (bandwidth), missing if Parameter B/T is set to OFF.
- **Parametr B/T:** Parametric equalizer also for bass/treble. If Parameter B/T is set to OFF, the equalizers for bass and treble act as shelving filters.
- **Upper Lvl Adj:** Allows separate upper manual default level setting.
- **Lower Lvl Adj:** Allows separate lower manual default level setting.
- **Pedal Lvl Adj:** Allows separate pedal default level setting.
- **Perc Lvl Adj:** Allows percussion level setting.
- **PedalRotBypas:** Routes the pedal signal to bypass the CaM Rotor, optionally only to the separate pedal output, if *No Pedal on Main* is set in parameter #1501, Bit 3 of the editor.
- **AO28 Tone Pot:** Tone potentiometer setting on preamp.
- **AO28 Gain Cap:** Overall gain of AO28 preamp.
- **AO28 MinSwell:** Minimum volume of swell pedal in heel position.
- **AO28 Tube Age:** Age of the preamp tubes. The older, the more clearly the triode distortion becomes audible.

Reverb Levels

Reverb Prgm: Reverb program selection (OFF, 1, 2, 3).

- **Reverb 1 Lvl:** Reverb portion in position REV 1.
- **Reverb 2 Lvl:** Reverb portion in position REV 2.
- **Reverb 3 Lvl:** Reverb portion in position REV 3.

Rotary Setup

Rotary Motor: RUN/STOP switch of the rotary simulation.

Rotary Fast: SLOW/FAST switch of the rotary simulation.

Bypass: Switching off the rotary simulation.

Rotary Model: HX3 contains predefined rotary models that are editable. With the Standard license you can choose from 6 models, with the Extended License from 16.

- **122 Std SmR** (Model 122 Standard, small room)
- **122 Std LgR** (Model 122 Standard, large room)
- **122 Old SmR** (Model 122 old, small room)
- **122 Old LgR** (Model 122 old, large room)
- **147 New SmR** (Model 147, small room)
- **147 New LgR** (Model 147, large room)
- ***760 Std SmR*** *(Modell 760, small room)*
- ***760 Std LgR*** *(Modell 760, large room)*
- ***SpaceSound***
- ***Sharma2001***
- ***Vibratone***
- ***Dynacord100***
- ***CLS-222***
- ***Custom 1***
- ***Custom 2***
- ***Custom3***

The Rotary Setup menu items have a common submenu:

- **HornSlowSpeed:** Rotation speed of the horn in SLOW position.
- **RotrSlowSpeed:** Rotation speed of the rotor in SLOW position.
- **HornFastSpeed:** Rotation speed of the horn in FAST position.
- **RotrFastSpeed:** Rotation speed of the rotor in FAST position.
- **HornRampUp:** Horn ramp up time.
- **RotorRampUp:** Rotor ramp up time.
- **HornRampDown:** Horn runout time
- **RotorRampDown:** Rotor runout time.
- **Rotary Throb:** Microphone placement.
- **Rotary Spread:** Stereo width.
- **Rotary Balnce:** Level balance between rotor and horn.
- **Tube Select A:** Age of power stage tube A, adjustable from 0 (very old) to 7 (new).
- **Tube Select B:** Age of power stage tube B, adjustable from 0 (very old) to 7 (new). If A and B are set differently, the proportion of the 2nd harmonic increases.

Percussion Setup

Percussion: Percussion selection stepwise in all possible combinations of NORM/SOFT, FAST/SLOW, 2nd/3rd (not for H100) and OFF. This menu is not active when *EnvelopeGen* mode is set. Then only (EG ADSR) appears to indicate that a percussion effect can be achieved here by shaping the ADSR envelope.

- **PercNormLvl:** Level in position NORMAL.
- **PerSoftLvl:** Level in position SOFT.
- **PercLongTm:** Decay time in position LONG.
- **PercShortTm:** Decay time in position SHORT.

Vibrato Setup

Vibrato UPR: Scanner vibrato upper manual OFF/ON.

Vibrato LWR: Scanner vibrato lower manual OFF/ON.

Vibr: Vibrato knob with the positions V1 ... C3.

The Vibrato Setup menu items have a common submenu:

- **Scanner Gear:** Vibrato frequency.
- **Ch Scanner Lvl:** Scanner portion in chorus positions C1 ... C3.
- **Ch Bypass Lvl:** Dry portion in chorus positions C1 ... C3.
- **V1/C1 FM Mod:** Modulation depth at positions V1, C1.
- **V2/C2 FM Mod:** Modulation depth at positions V2, C2.
- **V3/C3 FM Mod:** Modulation depth at positions V3, C3.

Phasing Mode

(not with B3, M100)

Phasing Fast: Switch to fast phasing effect.

Phasing Upper: Activates phasing rotor (PHR) for upper manual (insert effect).

Phasing Lower: Activates phasing rotor (PHR) for lower manual (insert effect).

The Phasing Mode menu items have a common submenu:

- ***PHR We/Boe:*** Selection of different phasing rotor models: On = We, OFF = Boe.
- ***PHR Ensemble:*** Strings effect with multiple modulation.
- ***PHR Celeste:*** Deep modulation with feedback.
- ***PHR Fading:*** Slow phasing effect.
- ***PHR Weak:*** Weak modulation, combinable.
- ***PHR Deep:*** Deeper modulation, combinable.
- ***PHR RotFast:*** Fast rotary effect.
- ***PHR Ramp up:*** Ramp-up effect for rotor slow/fast, combinable.

Without options, a slow rotary effect is active. *Weak, Deep, RotFast* and *RampUp* can be combined with it. Two additional vibrato effects can be achieved by simultaneously selecting the *Ensemble* and *Celeste* options as well as *Celeste* and *Fading*. These effects can be used, for example, as an additional vibrato channel for the H100 emulation.

- ***Sync PHR/Rotr:*** The fast / slow switching of the phasing takes place together with the rotor switching. So one footswitch can serve for both functions.

Organ Setup

Organ Model: HX3 contains predefined organ models that are editable. With the Standard license 4 models are available, with the Extended License 16.

- **B3 Standard** (B3 with nine drawbars per manual).
- **B3 Old** (1955 B3, Flutter and Leakage increased).
- **B3 Recapped** (B3 with new capacitors).
- **M100/M3**
- ***H100/12 DrB*** (H100 with three additional mixed drawbars per manual).
- ***Boehm*** (electronic key contacts, ADSR envelope).
- ***Boehm CnT/L*** (electronic key contacts, ADSR envelope).
- ***Wersi Space*** (electronic key contacts, ADSR envelope).
- ***Wersi Sacrl*** (electronic key contacts, ADSR envelope).
- ***FarfisCombo*** (electronic key contacts, ADSR envelope).
- ***Vox Conti*** (electronic key contacts, ADSR envelope).
- ***Conn/Church*** (electronic key contacts, ADSR envelope).
- ***Custom 1***
- ***Custom 2***
- ***Custom 3***
- ***Custom 4***

TG Tuning: Allows organ generator tuning in range from A = 433 through 447 Hz.

The organ setup menu items have a common submenu:

- ***Gating Mode:***
  - **B3/9 Drb:** The HX3 default setting (B3 mode) implies mechanical key contacts, 2 2/3' or 4' percussion, and 9 drawbars per manual.

    The remaining menu items require an Extended License.
  - ***H100/12 Drb*** switches to the H100 organ model including 3 additional mixtures. This activates the respective drawbars. B3 percussion is de-activated in this mode, instead the *H-Perc 16' … H-Perc Mixt3* in submenu Voice Upper settings are effective if **Perc ON** is selected. By means of this mask you may assign percussion individually to each available harmonic. Percussion always sounds without vibrato and phasing rotor. This mode may be combined with all generator models.
  - ***EnvelopeGen*** *(EG)* substitutes "mechanical" keying, which generates a key click, by "soft" electronic keying. This is the way to model the entirely electronic organs of the 80s. In this mode three additional mixtures are available; the respective drawbars are active. An ADSR envelope is applied to the harmonics selected by means of the *EnvEna 16' … EnvEna Mixt3* settings on the Panel or with TouchOSC.

- ***EG +PercDrb*** works like *EnvelopeGen (EG)*, but instead of the ADSR envelope a percussion envelope is active on the harmonics selected by the *EnvEna 16‘ … EnvEna Mixt3* settings in submenu Voice Upper. The percussion effect amount can be adjusted with the Envelope Generator Drawbars (*EGenvDB 16‘ …Mixt3)* on the Panel or with TouchOSC.
- ***EG +TimeDrb*** as well works like *EnvelopeGen (EG)*, but in this mode the Envelope Generator Drawbars (*EGenvDB 16‘ …Mixt3)* affect the decay and release times of the ADSR envelope on harmonics selected by the *EnvEna 16‘ … EnvEna Mixt3* settings in submenu Voice Upper. Thus you can create interesting transient and decay effects similar to a Fourier synthesizer by using time settings depending on the respective harmonics.

- **TG WaveSet:** Determines the content of harmonics in the generated sound. Automatically set for the selected organ model, but can be overridden in this menu:
  - B3 25%...38% k2 – B3, clean to rich harmonics (new to old organ)
  - Sine 2% k2 – clean LSI/transistor sine generator
  - Sawt Fltrd – Sawtooth-like tone
  - Sine LC Gen – sine wave generator with moderate k2 content
  - Sine TOSGen – square wave generator with sine wave filtering, sounds slighty hollow

- **TG Tapering:** Determines the volume proportions of the tonewheels:
  - Year 1955 – very old organ
  - Year 1961
  - Year 1972
  - Recapped – Organ refurbished with new capacitors
  - StraightLin – No "random" volume deviations
  - Twangy – Emphasis on higher notes

- **TG Flutter:** Adjusts tone generator "sloppyness" (spring clutch tension, bearing precision, and resulting slow phase shifts and pitch changes).

- **TG Leakage:** Sets tone generator leakage (crosstalk noise of adjacent notes, “growl”).

- **ContSpringFlx:** Adjusts key contact spring flex, thereby affecting click frequency.

- **ContSpringDmp:** Adjusts key contact spring damping, thereby affecting click length.

- **ContEarlyActn:** Fatar keyboards only: Sound triggering on upper key contact. If OFF, the organ sound is triggered with the lower key contact. MIDI NOTE ON on the other hand is always sent with velocity and thus after closing the lower contact.

- **NoDB1@Perc:** With the original, the 1' drawbar is switched off during percussion when PERC is ON. This behavior can be switched off here.

Keyboard/MIDI

MIDI Transpose: Allows transposition of sound generation by up to +24/-24 half note steps. Note: Like the original, tonewheel generator includes 5 octaves. Notes outside this range do not sound.

- **MIDI CHANNEL:** Sets the MIDI basic receive channel from 1 to 10 (upper manual, lower manual +1 , pedal + 2).
- **MIDI OPTION:** Sets the MIDI Routing to
  - Local Tx – own MIDI Events are sent to MIDI OUT
  - Inp 1 Thru – MIDI IN1 is routed as THRU to MIDI OUT
  - Inp 2 Thru – do not use
  - USB InThru – USB MIDI IN is routed as THRU to MIDI OUT
- **MIDI CC Set:** Sets the HX3 accepted MIDI CC set to
  - NI B4 d3c: Native Instrument B 4, Döpfer d3c controller (default), NI B4D
  - Hammond XK
  - Hammond SK (Note: Hammond changed MIDI CC set between XK and SK series, so try out which fits)
  - Versatile MIDI CC Set
  - Nord C1/C2 MIDI CC Set
  - Voce Drawb – Voce MIDI drawbars
  - KeyB/Duo
  - Hamichord (or „Mojo“, same hardware)
  - HX3.5/KBP MIDI CC Set
  - Nord C2D
  - Visc Legend
- **MIDI Swell CC:** CC number for swell pedal (default 11, expression pedal).
- **MIDI VolumeCC:** CC number for Master Volume (default 7, volume pedal).
- **MIDI PresetCC:** CC number for presets (default #32 bank select LSB)
- **TransposeOffs:** Transposition of directly connected Fatar keybed can be shifted for special purposes. Affects MIDI OUT only.
- **Local On/Off:** Interrupts the connection from a directly connected keyboard to the tone generator. Notes are only sent via MIDI.
- **Split Keyb:** When ON, the keyboard is split into two zones at the set split point.

- **Split Point:** Sets split point (when split is ON) as key number (24 is second „C“ on manual).
- **Split Mode:** Default split setting on power-up, engaged when split set to ON.
  - 'PedalToLower', map pedal to lower manual up to split point.
  - 'LowerToUpper', map lower to upper manual up to split point.
  - 'PedalToUpper', map pedal to upper manual up to split point.
  - 'Lower+1 ToU', map lower to upper manual up to split point, transpose lower +1 octave.
  - 'Lower+2 ToU' map lower to upper manual up to split point, transpose lower +2 octave.
  - ‘LwrAddPedal’, links the pedal to the lower manual up to the split point.

Split point and split mode may also be changed by one of the following procedures:

- Pedal to Lower: Press a **single key** on lower manual key while switching SPLIT on to obtain a custom split point.
- Lower Add Pedal: Press a **two keys** on lower manual key while switching SPLIT to link the pedal to lower manual up to the split point.
- Lower to Upper: Press a **single key** on upper manual while switching SPLIT on to map lower to upper manual up to this key.
- Pedal to Upper: Press **two keys** simultaneously on upper manual while switching SPLIT on to map pedal to upper manual up to highest of both keys pressed (useful for playing pedal bass lines on single manual keyboards without bass pedal).
- Lower +1 to Upper: Press **three keys** simultaneously on upper manual while switching SPLIT on to map lower to upper manual up to highest of all keys pressed. Lower notes range is transposed one octave up (useful for left-hand 8’ accompaniment chords on single manual keyboards).
- Lower +2 to Upper: Press **four keys** simultaneously on upper manual while switching SPLIT on to map lower to upper manual up to highest of all keys pressed. Lower notes range is transposed two octaves up (useful for left-hand 16’ accompaniment chords on single manual keyboards).

- **No PrgChgRcv:** MIDI Program Change is ignored when ON

MIDI Control

HX3 accepts MIDI key on/off events (default: channel 1 to upper manual, 2 to lower manual, channel 3 to bass pedal) as well as various MIDI CCs with selectable compatibility sets. The base channel 1 can be changed via menu MIDI CH. MIDI dynamics slightly affect key click noise. SysEx data other than its own is always ignored.

Both MIDI jacks act as MIDI inputs with equal priority for connection of two master keyboards or keyboard and bass pedal. Connecting a third MIDI device requires a MIDI Merge Interface.

HX3 functions that are relevant for the organ player may be remote-controlled by MIDI commands. For details please see HX3 MIDI Implementation. However, some settings are only possible via the menu system or with the HX3 Manager. To recall presets via MIDI use bank select LSB (CC #32, changeable via menu). To recall voices use MIDI Program Change on the respective channel.

General

Connect MIDI Out of your MIDI controller or master keyboard to HX3 MIDI input. HX3 cannot determine the setting of any MIDI controller value until you touch/use it once. As default, all HX3 controllers are OFF. Do not use any controller button or drawbar unless HX3 is ready to accept its data; it is a good idea to power up HX3 first and later your MIDI master keyboard or master controller.

HX3 supports MIDI over USB through its USB port connected to a USB host, typically a PC. The USB connection is also used to control the HX3 via the HX3 panel application, for firmware updates via MIDI SysEx and DSP updates via DFU.

The USB port and MIDI IN 2 cannot be used at the same time. Please remove any cable from MIDI IN 2 before using the USB port.

MIDI CC #7 (default, CC number variable) controls master volume. MIDI CC #11 (default, CC number variable) controls swell pedal/expression if no expression pedal connected to HX3. If you use your HX3-attached swell pedal, any MIDI expression message will be overwritten. If the attached swell pedal is not actuated, MIDI expression messages are accepted. Any valid MIDI CC command will overwrite the HX3's own analog controllers and switches until they are changed on the HX3 itself.

Note: Some MIDI controllers as well as organ keyboards (like Hammond® XK and SK series) allow 2nd and 3rd harmonic percussion ON at same time. HX3 implementation regards "2nd ON" as "Percussion ON" tab in this case.

Panic button

In case of stuck notes just press the upper or lower menu panel button to switch the tone generator off.

Supported keyboards and MIDI controllers

Ten CC Sets are installed ex works, CC Sets for other keyboards and controllers can easily be loaded with the CC Set Editor of the HX3 Manager and installed on the HX3 Sound Module. You can find alternative CC Sets in the "user" subdirectory of the firmware folder. Customized CC Sets and templates for additional devices can also be found on our update server in the directory User Contributed.

Example: Voce MIDI Drawbars

Using your HX3 board with Voce MIDI Drawbars is straightforward, as the Voce module supports only one MIDI channel (i.e. upper manual). Please note that Voce MIDI Drawbars does not send drawbar data unless you press the “Drawbar/Save” button, so it’s LED lits up.

Example: Doepfer d3c or other NI B4 drawbar controller

The Doepfer d3c drawbar controller is a very nice and rugged piece of gear, so we recommend it for use with our HX3 board. It supports foot controllers and foot switches. The Keyswerk/Böhm db4 is also compatible with NI B4 CC set. Upper, lower and bass drawbars work as usual. Also the Percussion and Vibrato buttons work as described in d3c manual.

The BRIGHTNESS knob controls AO28 “tone” parameter in HX3. The KEY CLICK knob controls the bass sustain. Do not use the “Harmonic content” knob as it sends the “Percussion” button’s controller number like a continuous controller. Why that? No idea. This is definitely of no use.

Preset buttons may be used, but in a restricted way. First, HX3 yields 16 presets per manual, not 127 like NI B4. When selecting “Bank 1”, all 12 available preset buttons work on upper manual. When selecting “Bank 2”, all 12 preset buttons work on lower manual. Doepfer d3c resends the program change message when changing the bank, which may be annoying. Choose bank 2, lower preset first, then bank 1, upper preset. BTW: Bank buttons do not send bank select messages, they just add an offset to the preset buttons. Blame Doepfer for that. Doepfer d3c preset 1 is the HX3 “Live” (preset 0) position.

Example: Hammond XB series

The HX3 Expander is also suitable for the Hammond XB series from firmware version 5.710. All switching functions are supported, but not the pots, because they do not send MIDI data. The preset buttons of the XB3 are assigned in descending order, starting with Voice #0 on the B. However, to make the compatibility with XB2 and XB5, also the low C had to be assigned with Voice #0, therefore only 11 drawbar presets can be addressed. Please note: MIDI data transmission works with the XB2 only with firmware version 2.0 or higher.

Example: Hammond XK/SK series

HX3 supports most of Hammond XK MIDI controller functions. For convenience, some controllers have been relocated to other HX3 functions:

- XK Overdrive knob controls HX3 Rotary Tube Amp Volume.
- XK Reverb button controls HX3 lower manual Vibrato ON/OFF.
- XK Tube On button controls HX3 Reverb.

Example: Nord keyboards

The CC Set Nord C1/C2 maps the knob 'Delay Tempo' with the HX3 function 'Volume', because 'Master Level' does not send MIDI data.

The CC Set for the Nord C2D supports the double drawbars (available in the CC Set Editor from parameter 1700 as "Indirect Drawbars"). Settings of the non-active drawbars are stored and recalled when switching. The CC Set Nord C2D maps the knob 'Delay Tempo' with the HX3 function 'Volume', because 'Master Level' does not send MIDI data.

Example: GSi DMC-122

The DMC-122 from GSi is a solid organ-style MIDI controller. It has two manuals with waterfall keyboards, drawbars for upper manual, lower manual and pedal, LED buttons for all required switching functions as well as six potentiometers and a rotary encoder. With this equipment, the DMC-122 is perfectly suited for the HX3 Sound Module or a MIDI controlled HX3 board.

The controls can be assigned MIDI messages using the DMC-122 editor. The assignment (called "setup" by GSi) can be stored permanently in the device. A DMC-122 setup suitable for the HX3 is available for download on our update server. The setup is adapted to the MIDI CC set "HX3.5/KBP", which can be set on the HX3 device. Please see the included README file.

Controls assignment:

- D1 … D9: Upper Drawbars, D10, D11: Pedal Drawbars, D12 … D20: Lower Drawbars
- F1: Rotary RUN, F2: Rotary FAST
- Buttons 1…7: Presets 0…7
- Buttons 8: C/V Upper, 9: C/V Lower, 10: MULTI SEL V1, C1, V2, C2, V3, C3, 11: Reverb 1, 12: Reverb 2, 11+12: Reverb 3, 13: Pedal Bypass, 14: Tube Amp Bypass, 15: Rotary Bypass, 16: EQ Bypass, 17: Keyboard Split, 18: Percussion ON, 19: Soft, 20: Fast, 21: 3rd
- Pots P1: Master Volume, P2: Tube Amp Gain, P3: Reverb Volume, P4: Percussion Volume, P5: EQ Bass, P6 EQ Treble
- ENCODER: All 100 Presets

Updates

Updates of the operating software are provided as DFU files and can be transferred to the device under Windows with HX3 Manager or with the DreamDFU app included in the update directory.

A macOS version of the app named DreamDFU_kbp is available for download on the update server. Before you start using the app, please read the important note in the attached README file.

Put the HX3 device into DFU mode as described in the Start menu section, or by holding down the rotary knob when switching on. Then start DreamDFU. A file selection dialog opens where you can select the update package for your device. For a regular complete update select the file hx37_upd.dfu from the updates subdirectory. Wait until the unpacking is complete (displayed on the menu panel). Exit the DFU mode by restarting after the unpacking has been completed.

DSP Files

While sound generation for the organs takes place completely in hardware in an FPGA, HX3 uses a digital signal processor (DSP) for reverb effects (EFX) and General MIDI (GM) instruments. 128 GM sounds are installed as a so-called soundbank.

The DSP firmware and the DSP soundbank are normally included in the update package, but can also be updated separately via DFU. This comes into consideration if you want to do without the factory installed GM sounds and use other reverb programs. Please note: The USB-B socket on our old HX3 Extension Board mk4 has no direct connection to the DSP chip and therefore cannot be used for DSP updates.

In the update directory you will find the following files:

- DSP Firmware (file dsp_fw.dfu) with reverb and GM synthesizer sound generation),
- DSP Firmware (file dsp_fw_nogm.dfu) with reverb and more reverb programs, but without GM synthesizer sound generation),
- DSP default soundbank (file dm_bank.dfu), default soundbank for the DSP-GM synthesizer, contains the sounds specified by the GM2 standard),
- Optional soundbank (file ext_bank.dfu) with higher quality piano sounds for the DSP-GM synthesizer.

Reverb programs

0: Off

Factory installed:

1: Short Room

2: Room A

3: Room B

If you want to do without the GM sounds and prefer to use other reverb programs instead, put the HX3 device into DFU mode and install the file “dsp_fw_nogm.dfu “. Then these further reverb programs are available for selection:

4: Small Hall A

5: Small Hall B

6: Large Hall A

7: Large Hall B

8: Short Plate

9: Vocal Plate

In the editor (parameters #2001 to #2003), select the desired reverb programs for the settings Reverb 1, 2 and 3.

How To …?

How do I store drawbar settings as preset?

The Voice memories 0 ... 15 only record the drawbar settings for the manuals and the pedal. Saving takes place in the Voice main menu or a sub-menu for the drawbar setting. Press the knob until "Save AAAA to Voice #XX" ("AAAA" stands for Upper, Lower or Pedal) appears. Select the destination Voice preset number and press the knob again to confirm.

In any other menu, the current drawbar setting is stored as Voice 0 along with all other settings as the Common Preset. Press the knob until "Save to Preset #XX" appears in the display. ("XX" stands for the destination preset number). Select the destination preset number as desired and press the rotary knob again to confirm.

In which way does the live preset 0 differ from other presets?

Traditionally, the live preset 0 is not a real preset, but instead applies the current “live” settings of the drawbars and control switches. If you select a preset different from 0, your live settings will remain stored. If you return to preset 0, the stored live settings will be recalled. In addition to that, the HX3 preset 0 preserves other parameter settings, which are cannot be set “live” by drawbars or other controls. It also determines the power-up settings.

How do I copy a stored preset to another preset?

Press the rotary knob twice to navigate to the preset/drawbar menu. Select the preset you wish to copy. Keep the button pressed until “Save to Preset #XX” appears on the display. (“XX” representing the current preset number and the target preset number, respectively). Turn the rotary knob to select the target preset number. Press the rotary knob until “Saved to Preset #XX” appears on the display.

How do I access the General MIDI instruments?

Go to the submenu of the manual or pedal to which you want to assign a GM instrument. Turn the knob until you reach the GM program selection. Briefly press the knob and select the desired instrument. Set the desired level at the next menu position. If you do not want the GM instrument to sound as a layer with the organ, set the drawbars to zero.

Touch control by tablet / smartphone

To operate the HX3 MIDI Sound Module with WiFi interface via TouchOSC on tablet or smartphone (Android, iOS) or with wired connection (iOS only) please refer to the separate HX3 Touch Control User Manual (PDF).

Serial numbers and licenses

HX3 is protected against forgery by licence numbers. If not set appropriately after firmware update, HX3 will refuse to work after 2 minutes. Licences may be re-installed by means of the HX3 Manager at any time.

Please contact KeyboardPartner to obtain a valid licence key. We need your serial number (issued on startup and by HX3 Manager application) to generate new licences for you.

Documents library, Download repository:

updates.keyboardpartner.de

Join the **HX3 community** at http://forum.keyboardpartner.de

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