

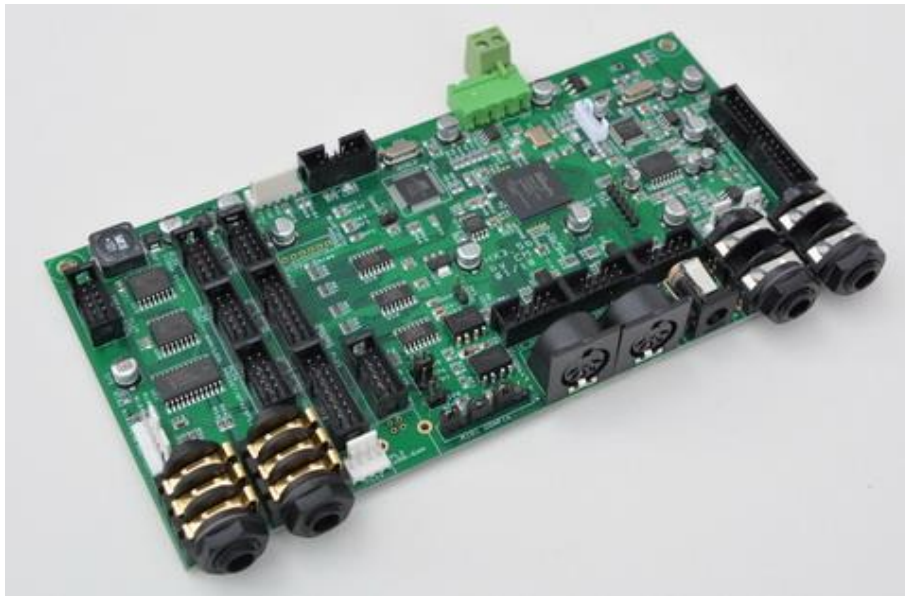
HX3

SOUND ENGINE

User Manual

HX3.5 Mainboard

(Firmware version 5.63x, February 2021)





Please read this manual carefully before using the HX3 Mainboard.



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

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

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

HX3.5 Mainboard

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, July 2020

Carsten Meyer / Geschäftsführer

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HX3.5 Mainboard

HX3.5 is a tonewheel emulator with all the features of a classic electromagnetic organ. It is controllable via MIDI with selectable CC sets for various keyboards. Alternatively, it may be controlled directly by Fatar or other keybeds as well as drawbars, switches and buttons. HX3 provides unlimited polyphony, 100 presets, parameters tweakable by menus. In addition, General MIDI sounds like piano and strings are available.

As an option (extended license required), the HX3 RealOrgan engine is capable of emulating all electromagnetic organs including the famous H100, combo organs, concert organs of the 70s and 80s like Böhm Orchester 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 circuit board, 200 x 100 mm
- Authentic reproduction of generator, tapering, key contacts, percussion and vibrato by massively parallel physical modelling
- Extremely low internal latency of 50 microseconds Key-to-Audio. However, MIDI transmission delay is about 1 ms per note played.
- Natural key click by "rattling" contacts
- Authentic 'CaM Rotor' simulation with 122 amp
- General MIDI (GM) Synth, 54x polyphonic
- Tunable in range of A = 433 through 447 Hz
- Effects DSP providing 3 reverb levels
- Dual MIDI IN for 2 separate keyboards or bass pedal
- LCD display and menu system available
- Swell (expression) pedal and footswitch jacks
- USB for MIDI over USB, firmware updates, parameter editing

Default MIDI setting: channels 1/2/3 for upper/lower/bass, MIDI CC NI B4.

DC input 9 to 12V, 500 mA min., 5.5/2.1 mm plug, plus on center or through connector PL12, alternatively 5V through connector PL11.

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Jack Connections

HX3.5 mainboard jack connections from left to right:

- **SWELL PEDAL** 1/4" stereo jack: Expression pedal input is compatible with Yamaha FC-7 and similar expression pedals. Plug connection: Sleeve = ground / potentiometer start, ring = potentiometer tap, tip = potentiometer end. Expression may also be remote-controlled by MIDI control change.
- **FOOT SWITCH** 1/4" stereo jack: Single or double footswitch controls simulated **rotary speed**: SLOW/FAST on plug tip, RUN/STOP on plug ring. Please use latching foot switches; momentary (button type) switches are not supported. If single footswitch used, Rotary is always on RUN (no plug ring, input grounded by plug sleeve).
- **USB** USB B-type connector for MIDI over USB, updates, parameter editing. USB port and MIDI IN/OUT cannot be used at the same time.
- **MIDI IN/OUT** Factory default secondary MIDI input for additional lower manual, bass pedal or MIDI controller. Optionally jumpered to supply +5V/200ma to our Drawbar Controller (phantom voltage) or pedal scan board Bass25. May be changed to act as MIDI OUT by internal jumper swap. See HX3.5 Mainboard Installation Manual for details.
- **MIDI IN** Primary input from MIDI keyboard.
- **DC IN:** Use stabilized DC wall wart 9 to 12V with at least 500mA current output, inner/outer plug diameter 2.1/5.5 mm on DC input jack. Polarity: positive voltage on inner tip.
- **AUDIO1/AUDIO2:** Main audio stereo output. Output level is approx. 300 mV at full swell.

For full control of parameter settings, we recommend the use of our MenuPanel. Installing the menu panel and other peripherals is described in the HX3.5 Installation Manual. The menu system for a standard organ configuration, using drawbars, our Panel16 switch button board, and keybeds connected through our key scanning boards is described below.

Please note: Factory default programming is the HX3 MIDI Expander firmware. You may set up the HX3.5 mainboard conveniently for your organ configuration by means of the HX3.5 Editor. See the [HX3.5 Manager User Manual](#) for details. All software, documentation, and manuals are available online on keyboardpartner.com under **Support & Download**.

Swell Pedal/Volume Control

Output level of all output channels is controlled by **Master Volume** setting in menu or MIDI CC #7 "Volume", whichever occurs last.

Organ's **swell pedal** position is controlled by an expression pedal or MIDI CC #11 "Expression", whichever occurs last. HX3 resembles a loudness curve similar to the swell pedal of a classic tonewheel organ, so expression volume will not reach zero. We recommend connecting an expression pedal **Yamaha FC-7** or similar (1/4" jack, 10k to 47k total resistance) directly to the HX3 module. By using an expression pedal rather than MIDI sweller control will be faster and more precise.

MIDI CC #11 and #7 may be changed by menu to any other valid MIDI CC number.

Controls

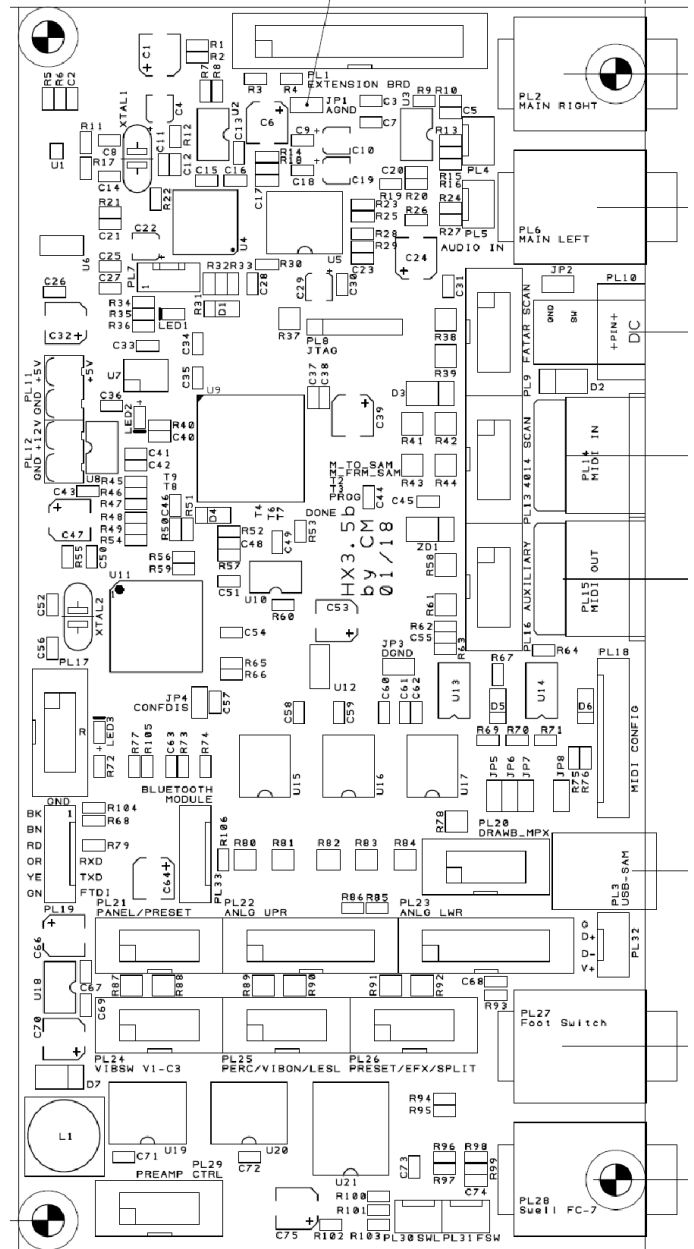
Up to 64 pushbuttons or switches and up to 88 potentiometers (also drawbars) can be connected to the HX3.5 mainboard. In the standard configuration one panel16 is needed. All details and a larger picture of the board can be found in the [HX3.5 Mainboard Installation Manual](#).

Connectors and Jumpers on the Mainboard

PL1: HX3 Extension Board (optional)
PL2: 1/4" jack Right Audio Output
PL3: USB B type socket (USB MIDI)
PL4: Stereo Audio Output; center = GND
PL5: Stereo Audio Mixer Input; center = GND
PL6: 1/4" jack Left Audio Output
PL7: DSP Debug (do not use)
PL8: FPGA Debug (do not use)
PL9: Scan Board (FatarScan2)
PL10: DC input, 5V or 9..12V/500mA, plus on center
PL11: DC input/output, 5V/500mA
PL12: DC input, 9..12V/500mA
PL13: Scan Board (Scan16, Scan61 or Bass25)
PL14: MIDI IN1
PL15: MIDI IN2/OUT
PL16: Aux digital output (do not use)
PL17: SD Card Adaptor (or ISP AVR)
PL18: MIDI IN/OUT Configuration Jumpers
PL19: Serial Interface for FTDI cable
PL20: Drawbar MPX (HX3 mk5 new drawbars)
PL21: MenuPanel/Presets-Boards, I2C
PL22: Analog Upper (in mk4 compatibility mode)
PL23: Analog Lower (in mk4 compatibility mode)
PL24: Vibrato Rotary Switch
PL25: Buttons/Switches Perc, Vib, Rotary control
PL26: Buttons/Switches Common Presets or Vibrato Buttons, Reverb, Bass On Amp, Split
PL27: 1/4" jack Footswitch Rotary control
PL28: 1/4" jack Swell Pedal (FC-7 compatible)
PL29: Preamp control outputs, var. control signals
PL30: 3 pin header Swell Pedal (FC-7 compatible)
PL31: 3 pin header Footswitch Rotary control
PL32: 4pin USB header to HX3.5 Extension Board
PL33: Bluetooth/WiFi Module

JP1: Analog Ground (Probe Connection), both pins
JP2: 5V DC input on PL 10/PL12 if inserted
JP3: Digital Ground (Probe Connection), both pins
JP4: Config Disable (do not use)
JP5: Swell on Analog Input 12 (do not use)
JP6: Swell on AVR analog input PA2 (**default**)
JP7: Swell on AVR analog input PA7 (do not use)
JP8: Use USB for power supply (not recommended)

Default jumper setting: Insert JP6. Insert 2 jumpers on PL10 pin 2-3 and 5-6 (leftmost pin is 1) for secondary MIDI IN.



HX3 Apps and Tools

The following chapter describes how you can control the HX3 System completely via the menu panel. However, there are other, more convenient options: Use the Panel in the HX3.5 Manager for operation via PC or notebook. Use TouchOSC for operation via tablet or smartphone.

HX3.5 Manager

The HX3.5 Manager supports the use of your HX3 device with a variety of functions:

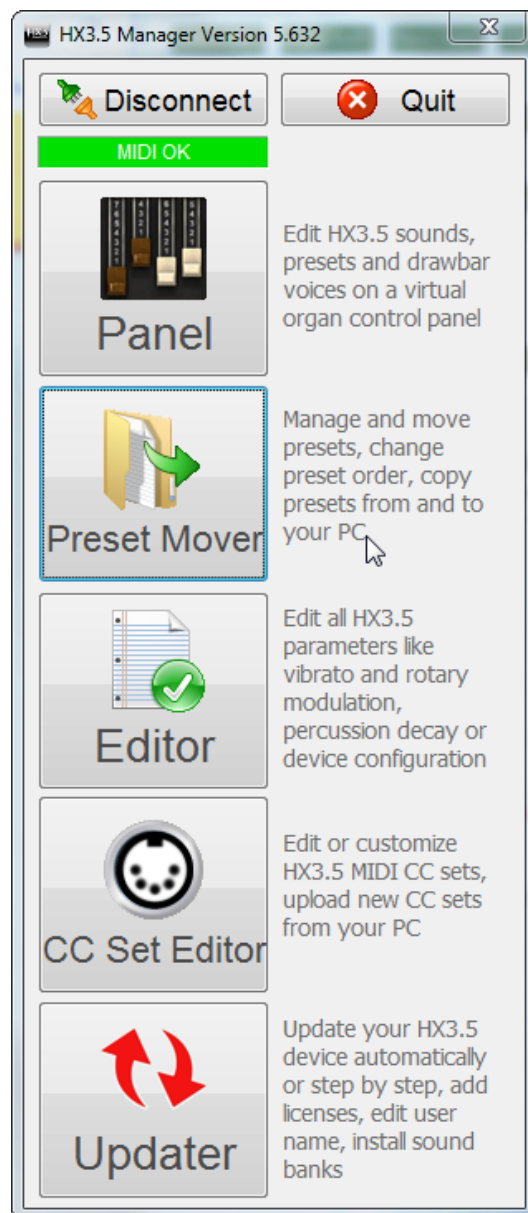
The **Panel** contains switches and drawbars for your HX3 device. In the panel window you can adjust sounds and effects, create, name and save presets. When the panel is open, you can recall presets live using the function keys on your PC keyboard.

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 HX3.5 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 completely in an automatic process or individual selected parts. Use the Updater also to activate an Extended License or to change the username.

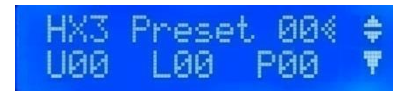


TouchOSC for HX3.5

Control your HX3 device via tablet or smartphone with the TouchOSC 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 we offer a WLAN interface. iOS devices can also communicate with TouchOSC via MIDI over USB.

Menu Panel

On 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 knob 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, tab switch settings (percussion, vibrato etc.), volume and 122 tube amp gain as well as all other effects, including rotary. Preset 0 takes over the live setting of the drawbars (not with HX3 MIDI Expander) and restores all other settings as they were when leaving Preset 0.

Scroll downwards (= turn the rotary knob clockwise) to the drawbar presets (**Voices**) for **Upper manual**, **Lower manual**, and **Pedal**.



Preset 0 takes over the live setting of the drawbars (not with HX3 MIDI Expander). 15 more settings may be stored and recalled. This ensures compatibility with organs equipped with preset keys. 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. The amplifier saturates and distorts at high values and higher swell pedal settings like a true tube amp. The degree of distortion is thus controlled by the swell pedal.



A star appears at the bottom right of the display, if a parameter value has been changed and differs from the stored preset. To **store** values as **Preset**, keep the encoder knob pressed until the prompt “Save to Preset #XX” appears on the display. (“XX” representing the current preset number). Alter the number as desired and press the knob once again to have all settings stored.

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**. Values tagged by **U**, **L**, or **P** are part of the current voice for upper, lower, or pedal. These are stored in the preset as well.

Please note: The HX3 menu has two levels. The top-level **main menu** (left column in the following overview) contains the parameters that are frequently used. In the **submenu** of the respective function group you will find less frequently required parameters and fine adjustments. Press the lower button to go to a submenu. An “S” symbol appears at the bottom right of the display. Press the upper button to return to the main menu.

The menus are arranged as a loop. So you may reach any menu entry by either scrolling upwards or downwards.

Menu Overview

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). In the overview, an **H** marks a menu item that appears only in *H100 mode* while an **E** marks a menu item that is available in *EnvelopeGen (EG) mode*.

<u>Main Menu</u>	<u>Submenu</u>	<u>Group</u>
		Italic <i>Extended License</i> H <i>H100 Mode</i> E <i>EG Mode</i>
HX3 Preset	LED Dimmer	Presets
	SD File Exec	Preset Selection 0...99
	WiFi Init Def	Brightness of LEDs on connected boards
		Script file selection from SD card
		WiFi reset to default settings
Voice Upper	UpperDB 16	Upper Manual
	UpperDB 5 1/3	Upper Voice Selection 0...15
	UpperDB 8	
	UpperDB 4	
	UpperDB 2 2/3	
	UpperDB 2	
	UpperDB 1 3/5	
	UpperDB 1 1/3	
	UpperDB 1	
	H E UpperDB Mix 1	
	H E UpperDB Mix 2	
	H E UpperDB Mix 3	
	E Upper Attack	
	E Upper Decay	
	E Upper Sustain	
	E Upper Release	
	E UpperADSR Hrm	
	H H100 HarpSust	
	H H100 2ndVoice	
	H E H-Perc/EnvEna 16"	
	H E H-Perc/EnvEna 5 1/3'	
	H E H-Perc/EnvEna 8"	
	H E H-Perc/EnvEna 4"	
	H E H-Perc/EnvEna 2 2/3'	
	H E H-Perc/EnvEna 2"	
	H E H-Perc/EnvEna 1 3/5'	
	H E H-Perc/EnvEna 1 1/3'	
	H E H-Perc/EnvEna 1"	
	H E H-Perc/EnvEna Mixt 1	
	H E H-Perc/EnvEna Mixt 2	
	H E H-Perc/EnvEna Mixt 3	
	E EnvEna ToDry	

Standard drawbars

Mixture drawbars for H100 and EG Mode

Envelope Attack Time
Envelope Decay Time
Envelope Sustain Level
Envelope Release Time
Shortens/lengthens ADSR times dep. on harmonic
H100 Harp Sustain Effect, 4'
H100 Percussion harmonics without decay (dry)

EG Mask for ADSR harmonics (ON: ADSR envelope)
or H100 Percussion harmonics

EG Mask harmonics not through Vibrato and PHR

E EGenvDB 16
E EGenvDB 5 1/3
E EGenvDB 8
E EGenvDB 4
E EGenvDB 2 2/3
E EGenvDB 2
E EGenvDB 1 3/5
E EGenvDB 1 1/3
E EGenvDB 1
E EGenvDB Mix 1
E EGenvDB Mix 2
E EGenvDB Mix 3

EG Percussion Mode Attack/Decay Volume
 (Percussion drawbars in EG Mode)

UpperGM Prg 1
 UpperGM Lvl 1
 UpperGM Hrm 1
 UpperGM Prg 2
 UpperGM Lvl 2
 UpperGM Harm2
 UpperGM Detn2

GM program number Voice 1
 Level GM Voice 1
 Harmonic Transposition GM Voice 1
 GM program number Voice 2 (Overlay)
 Level GM Voice 2 (Overlay)
 Harmonic Transposition GM Voice 2 (Overlay)
 Detuning GM Voice 2 (Overlay)

Voice Lower

LowerDB 16
 LowerDB 5 1/3
 LowerDB 8
 LowerDB 4
 LowerDB 2 2/3
 LowerDB 2
 LowerDB 1 3/5
 LowerDB 1 1/3
 LowerDB 1

Lower Voice Selection 0...15

Standard drawbars

H E LowerDB Mix 1
H E LowerDB Mix 2
H E LowerDB Mix 3
E Lower Attack
E Lower Decay
E Lower Sustain
E Lower Release
E LowerADSR Hrm

Mixture drawbars for H100 and EG Mode

Envelope Attack Time
 Envelope Decay Time
 Envelope Sustain Level
 Envelope Release Time
 Shortens/lengthens ADSR times dep. on harmonic

E EnvEna 16"	}	EG Mask for ADSR harmonics (ON: ADSR envelope)
E EnvEna 5 1/3'		
E EnvEna 8"		
E EnvEna 4"		
E EnvEna 2 2/3'		
E EnvEna 2"		
E EnvEna 1 3/5'		
E EnvEna 1 1/3'		
E EnvEna 1"		
E EnvEna Mixt 1		
E EnvEna Mixt 2	}	GM program number Voice 1 Level GM Voice 1 Harmonic Transposition GM Voice 1 GM program number Voice 2 (Overlay) Level GM Voice 2 (Overlay) Harmonic Transposition GM Voice 2 (Overlay) Detuning GM Voice 2 (Overlay)
E EnvEna Mixt 3		
LowerGM Prg 1		
LowerGM Lvl 1		
LowerGM Harm1		
LowerGM Prg 2		
LowerGM Lvl 2		
LowerGM Harm2		
LowerGM Detn2		

Voice Pedal

PedalDB 16	Pedal Voice Selection 0...15
PedalDB 16H	Pedal mixture 16' mellow
PedalDB 8	Pedal mixture 16' bright
PedalDB 8H	Pedal mixture 8' mellow
Pedal Attack	Pedal mixture 8' bright
Pedal Decay	Envelope Attack Time
Pedal Sustain	Envelope Decay Time
Pedal Release	Envelope Sustain Level
Pedal Harmonc	Envelope Release Time
PedalGM Prg 1	Shortens/lengthens ADSR times dep. on harmonic
PedalGM Lvl 1	GM program number Voice 1
PedalGM Harm1	Level GM Voice 1
PedalGM Prg 2	Harmonic Transposition GM Voice 1
PedalGM Lvl 2	GM program number Voice 2 (Overlay)
PedalGM Harm2	Level GM Voice 2 (Overlay)
PedalGM Detn2	Harmonic Transposition GM Voice 2 (Overlay)
	Detuning GM Voice 2 (Overlay)

Master Volume
TubeAmp Gain
TubeAmpBypass

Bass Equal

Bass Equ Frq
Bass Equ Q
Mid Equal
Mid Equ Frq
Mid Equ Q
Treble Equal
Treb Equ Frq
Treb Equ Q
Parametr B/T
Upper Lvl Adj
Lower Lvl Adj
Pedal Lvl Adj
UprDryLvl Adj
Organ Sum Lvl
GM Synth Lvl
SeparatePedal
AO28 Tone Pot
AO28 Gain Cap
AO28 MinSwell
AO28 Tube Age

Audio Setup

Overall output volume
Rotary tube amp gain
Rotary tube amp bypass
Bass EQ setting
Bass EQ frequency
Bass EQ bandwidth
Mid EQ setting
Mid EQ frequency
Mid EQ bandwidth
Treble EQ setting
Treble EQ frequency
Treble EQ bandwidth
Parametric EG also for Bass/Treble
Upper manual level adjustment
Lower manual level adjustment
Pedal level adjustment
Upper manual level adjustment (w/o Vibrato/PHR)
Organ overall level adjustment
GM Synth (layer voice) level adjustment
Pedal on separate output, not routed to tube amp
TONE pot position on preamp
Preamp gain
Swell pedal minimal volume
Age of preamp tubes (triode distortion)

Rotary Motor
Rotary Fast
Rotary Bypass

HornSlowSpeed

RotrSlowSpeed
HornFastSpeed
RotrFastSpeed
HornRampUp
RotorRampUp
HornRampDown
RotorRampDown
Rotary Throb
Rotary Spread
Rotary Balnce

Rotary Setup

RUN/STOP switch rotary motor
SLOW/FAST switch rotary motor
Rotary simulation bypass
Horn SLOW speed
Rotor SLOW speed
Horn FAST speed
Rotor FAST speed
Horn run-up time
Rotor run-up time
Horn run-down time
Rotor run-down time
Microphone placement
Stereo width
Rotor/Horn balance

Percussion

PercNormLvl
PercSoftLvl
PercLongTm
PercShortTm
PercMutedDB
Perc/2ndV Vol
PercPrecharge

Percussion Setup

Percussion selection, 8 (4 for H100) positions
Level in Position NORMAL
Level in Position SOFT
Decay time in Position LONG
Decay time in Position SHORT
Drawbar level muting in Position NORMAL
Percussion level or 2nd Voice with H100
Retrigger charging time

Vibrato Upper ON Vibrato Lower ON Vibrato Knob

Scanner Gear
Ch ScannerLvl
Ch Bypass Lvl
VibCh Age/AM
VibCh Respons
PreEmphasis
PreEmpfCutoff
LC Feedback
LC Reflection
LC HF Leak
V1/C1 FM Mod
V2/C2 FM Mod
V3/C3 FM Mod
Chorus ModEnh
SegmentFluttr

Vibrato Setup

Scanner vibrato upper manual On/Off
Scanner vibrato lower manual On/Off
Vibrato knob V1...C3
Transmission (vibrato frequency)
Scanner portion in chorus positions C1..C3
Dry portion in chorus positions C1..C3
Tremolo portion due to aged capacitors
Frequency response of delay line
Treble boost pre vibrato circuit
Frequency limit of the treble boost
Feedback for Celeste effect (M100/H100)
Reflexion portion due to aged capacitors
Scanner leakage (higher notes w/o modulation)
Modulation depth in positions V1/C1
Modulation depth in positions V2/C2
Modulation depth in positions V3/C3
Modulation boost for chorus
Cross modulation at segment transitions

Phasing Fast Phasing Upper Phasing Lower

We/Boe
Ensemble
Celeste
Fading
Weak
Deep
RotFast
Ramp up
Sync PHR/Rotr

Phasing Mode

Phasing speed
Phasing rotor on upper manual
Phasing rotor on lower manual
Phasing rotor model
Ensemble/Strings effect
Celeste effect
Fading effect
Weak rotor effect
Deep rotor effect
Fast rotor effect
Slow ramp up
PHR speed follows rotary speed

Reverb Prgm

Reverb 1 Lvl
Reverb 2 Lvl
Reverb 3 Lvl

Reverb Levels

Reverb program selection (OFF, I, II, I+II)
Reverb portion in position REV I
Reverb portion in position REV II
Reverb portion in position REV I+II

Organ Preconf TG Tuning

Gating Mode

Gen&Vib Mode
Swell Type
TG Spread Type
TG Size
TG NonTaprVal
TG WaveSet
TG Flutter
TG Leakage
TG Tapering
TG LC FiltVal
TG Btm 16 Val
ContSpringFlx
ContSpringDmp
ContEarlyActn
No DB1 @Perc
Perc@LiveOnly
High Foldback
DB16 Foldback

Generator Setup

Organ Model Selection
Tone generator tuning
Key contact type: B3, *H100*, *EG Modus*
Preselection Generator/Vibrato model
Type of swell pedal
Pitch contour: Hammond, TOS, single note
Number of generated notes
Generator level with linear tapering
Generator wave form
Generator fast frequency deviation
Generator Leakage
Manual tapering
Generator high frequency filter
Lowest octave 16' level
Key contact spring flex: Click frequency
Key contact spring damping: Click length
Early trigger with Fatar keybeds
ON: Percussion switches 1' drawbar off
ON: Percussion only active with live preset/voice 0
Foldback mode for upper octaves (ON: B3)
Foldback mode for 16' drawbar lowest octave

MIDI Transpos

KeybTranspos

Local On/Off
Split Keyb
Split Point
Split Mode
MIDI Channel
MIDI Option
MIDI CC Set
MIDI Swell CC
MIDI VolumeCC
MIDI PresetCC

Keyboard/MIDI Setup

Generator transposition (using MIDI IN)
Keyboard transposition
Attached manuals ON/OFF (individually)
Split keyboard ON/OFF
Split point when split is ON
Split mode (U/L/P)
MIDI base channel (upper, lower+1, pedal+2)
MIDI routing options
MIDI IN compatibility
MIDI controller number for swell pedal
MIDI controller number for volume
Number for presets (Default #32 Bank Select LSB)

Please note:

- Standard drawbars submenu is only available on HX3 MIDI Expander.
- ContEarlyActn is only available with Fatar keybeds.
- KeybTranspos, Local On/Off, Split Keyb, Split Point and Split Mode are only available with keybeds directly attached, not with MIDI keyboards.

Menu items that are not available in the selected configuration are marked as "(invalid)". With HX3.5 Editor, menu items can be removed from the menu.

On the following pages you will find further explanations of some menu items that may not yet be adequately described by the short comments in the overview.

Voice Upper

Here are the settings of the standard drawbars and the mixture drawbars. The latter are available in *Gating modes H100* and *EnvelopeGen* (see below).

- **UpperDB 16 ... UpperDB 1** – Drawbar settings for upper manual
- **H E UpperDB Mix1 ... UpperDB Mix3** – Mixture drawbar settings for upper manual. Each mixture consists of up to three higher harmonics at 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 X'** – select 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.



In *EnvelopeGen mode* the envelope that is effective for the harmonics activated by *EnvEna 16' ... EnvEna Mixt3* (see below) may be adjusted by these five parameters:

- **E Upper Attack** – affects rise time of upper manual envelope.
- **E Upper Decay** – affects decay time of upper manual envelope.
- **E Upper Sustain** – affects sustain level of upper manual envelope.
- **E Upper Release** – affects release time of upper manual envelope.
- **E Upper ADSR Hrm** – sets harmonic breakup of individual harmonics over time.

The harmonics to be affected by the ADSR envelope may be activated individually:

- **H E EnvEna 16'...EnvEna Mixt 3'** – select harmonics to which the ADSR envelope is to be applied. 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..



In addition there is the following option in *EnvelopeGen mode*:

- **E EnvEna ToDry** - harmonics selected by *EnvEna Mask* are bypassing vibrato and phasing rotor "dry".

In addition to the organ sounds, General MIDI (GM) instruments are available, which can sound as a layer at the same time. To activate a GM instrument, adjust its volume level as desired. To disable the organ, set all drawbars to zero.

With the *Extended License*, another sound layer can be used. This may be detuned to achieve even more sound effects.

- **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
- **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

Voice Lower

The keying mode setting (mechanical or electronic keying) also applies to the lower manual. In *H100 mode* and *EnvelopeGen mode* you have three additional mixture drawbars. Additionally, in *EnvelopeGen mode* the ADSR settings are available for the lower manual.

- **LowerDB 16 ... LowerDB 1** – Drawbar settings for lower manual
- **HE LowerDB Mix1 ... LowerDB Mix3** – Mixture drawbar settings for lower manual. Each mixture consists of up to three higher harmonics at individual levels. Please note: unlike the original H100, HX3.5 provides three mixes instead of two.
- **E Lower Attack** – affects rise time of lower manual envelope.
- **E Lower Decay** – affects decay time of lower manual envelope.
- **E Lower Sustain** – affects sustain level of lower manual envelope.
- **E Lower Release** – affects release time of lower manual envelope.
- **E Lower ADSR Hrm** – sets harmonic breakup of individual harmonics over time.
- **HE EnvEna 16'...EnvEna Mixt 3'** – select harmonics to which the ADSR envelope is to be applied. 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..

For the lower manual the same choice of General MIDI instruments is available as for the upper manual.

Voice Pedal

For the bass pedal an ADSR envelope is effective in every gating mode.

- **PedalDB 16 ... PedalDB 8** – Drawbar settings for pedal
- **PedalDB 16H ... PedalDB 8H** – Drawbar settings for pedal, brighter
- **Pedal Attack** – affects rise time of pedal envelope.
- **Pedal Decay** – affects decay time of pedal envelope.
- **Pedal Sustain** – affects sustain level of pedal envelope.
- **Pedal Release** – affects release time of pedal envelope (often called string bass “sustain” on other organs).
- **Pedal Harmonic** – sets harmonic breakup of individual harmonics over time. Set to lower values to obtain a „picked bass“ effect.

For the pedal the same choice of General MIDI instruments is available as for the upper and lower manuals.

Audio Setup

If you switch to the submenu from the main menu items **Master Volume**, **TubeAmp Gain** or **TubeAmpBypass**, you will end up with the equalizer settings. The three-band equalizer works parametrically: besides level, frequency and bandwidth (Q) are adjustable. If *Parametr B/T* is set to OFF, the equalizers for bass and treble act as shelving tone controls. More settings:

- **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.
- **UprDryLvl Adj** – allows separate upper manual default level setting of dry organ signal (without vibrato and phasing rotor).
- **Organ Sum Lvl** – allows organ generator default level setting.
- **GM Synth Lvl** – allows GM synthesizer default level setting.
- **SeparatePedal** – lets the bass pedal signal bypass the 122 amp and rotary simulation.
- **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.

Rotary Setup (see overview)

Percussion Setup

The main menu item Percussion is not active, when EnvelopeGen mode is selected. Then only (EG ADSR) appears as an indication that a similar effect can be achieved by designing the ADSR envelope.

- **Percussion** – may be selected in all available combinations of NORM/SOFT, FAST/SLOW, 2nd/3rd (not for H100) and OFF.

Vibrato Setup (see overview)

Phasing Mode

Phasing rotor settings are available only if the *Extended License* is installed.

- **Phasing Fast** – switch to fast rotary effect (same as in submenu).
- **Phasing Upper** – activates phasing rotor (PHR) for upper manual (insert effect).
- **Phasing Lower** – activates phasing rotor (PHR) for lower manual (insert effect).

From all three main menu items, you will be taken to the Phasing Mode submenu:

- **PHR We/Boe** – Switching between 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.

Reverb Levels (see overview)

Generator Setup

Organ Preconf

Organ Model Selection affects Gating Mode and Gen&Vib Mode (see below). With standard license only B3 Mode is available.

TG Tuning – allows organ generator tuning in range from A = 433 through 447 Hz.

Gating Mode

The HX3.5 default setting (B3 mode **B3/9 Drb**) implies mechanical key contacts, 2 2/3' or 4' percussion, and 9 drawbars per manual. The following options require the extended license.

Select **H100/12 Drb** for 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.

Select **EnvelopeGen (EG)** to substitute “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 in submenu Voice Upper.

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*).

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.

Gen&Vib Mode

The menu item **Gen&Vib Mode** gives you a choice of preselections of the sound generator type and the vibrato type. This is independent of the Gating Mode. The choice is:

- **B3 Std 91** (91 tones sound generator)
- **B3 Old 91** (as above, but more leakage, stronger key click)
- **M3/M100 79** (no foldback for higher tones)
- **H100 96** (96 tones sound generator)
- **TR Sine 96** (phase stable frequency dividing generator like Wersi/Böhm)
- **TR Square 96** (as above, more harmonics)
- **LC Gen 91** (free running single sine tone generator, 91 tones, not phase-locked)
- **Cheesy 84** (84 tones generator, phase-locked frequency divider, „cheesy sound“, rich harmonics)

Each setting includes its own vibrato parameters, which can be customized in the Vibrato Setup submenu.

More setup options in the Generator Setup submenu

The following settings override the default settings selected with **Gen&Vib Type** and are stored in the preset.

- **Swell Type** – Type of swell pedal:
 - Hammond
 - Audio (logarithmic curve)
 - linear
- **TG Spread Type** –Generators tuning system
 - B3/MH100 – Exact Hammond pitches with slight variations to equal pitch
 - TOS/Div2 – TOS generator with equal tuning and Div2 frequency dividers
 - SingleNote – Single note generator, slight random deviations
 - SingleNtDet – Single note generator, stronger deviations
- **TG Size** – Number of notes produced by the generator (74 to 96 useful). If necessary, notes are repeated above the top generator note (high foldback ON).
- **TG NonTapr Val** – Generator level with tapering setting StraightLin.
- **TG WaveSet** – determines the content of harmonics in the generated sound. Automatically set for the selected generator, 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 slightly hollow
- **TG Flutter** – adjusts tone generator "sloppyness" (spring clutch tension, bearing precision). .
- **TG Leakage** – sets tone generator leakage (crosstalk noise of adjacent notes, "growl").
- **TG Tapering** – sets tone generator age and characteristic:
 - Year 1955 (very aged caps, mellow sound)
 - Year 1961 (aged wax caps, jazz-type sound)
 - Year 1972 (new "red" caps, rock-type sound)
 - Recapped (more aggressive)
 - StraightLin (no tapering, equal loudness)
 - Twangy (emphasises higher notes)

- **TG LC FiltVal** – determines cut-off frequency of generator high pass filter. Lower values allow more background noise.
- **TG Btm16 Lvl** – lowest harmonic (16') level
- **ContSpringFlx** – adjusts key contact spring flex, thereby affecting click frequency.
- **ContSpringDmp** – adjusts key contact spring damping, thereby affecting click length.
- **ContEarlyActn** – sets tone triggering for Fatar keybeds to the higher key contact
- **NoDB1@Perc** – disables 1' drawbar cancelling when percussion ON (as original B3®).
- **Perc@LiveOnly** – If ON, percussion is like the original only active with live preset/voice 0. If OFF, percussion can be stored with all presets.
- **High Foldback** – Foldback mode for upper octaves (ON = B3, OFF = M3/M100).
- **DB16 1st Oct** – controls foldback behaviour on 16' lowest octave. Foldback is configurable in 4 settings:
 - Foldback – foldback with full level,
 - Full – no foldback ("all way down") with full level (like H 100®) or
 - Foldback muted – foldback with muted level (original B3® behaviour),
 - Full muted – no foldback ("all way down") with muted level.

Keyboard/MIDI

MIDI Transpos in main menu allows transposition of sound generation by up to +24/-24 half note steps. Note: Like the original, tonewheel generator includes 5 octaves. Therefore, notes outside this range do not sound.

- **KeyTranspos** – transposes the note number generated by a directly connected keyboard.
- **Local On/Off** – interrupts the connection from a directly connected keyboard to the tone generator. Notes are only sent via MIDI.
- **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
 - VoceDrawbar – Voce MIDI drawbars
 - KeyB/Duo
 - Hamichord (or „Mojo“, same hardware)
 - HX3.5/KBP MIDI CC Set
 - MIDI Customs CC Sets 1, 2
- **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)

Special configuration for keyboards without split function

Split functions, i.e. dividing the keyboard into zones with different MIDI send channels and possibly transposing the notes, should normally be provided by the controlling MIDI master keyboard. To use the device with keyboards that do not support split functions themselves, you can use the Updater in the HX3.5 Manager to optionally install the older scan driver "scanmidi_split.dat" on the HX3 MIDI Expander. The split functions described in the following section will then be executed by the HX3 Generator. With the "scanmidi_split.dat" driver, however, it is not possible to use the GM instruments.

Split Configuration (only with directly connected keyboard)

Keyboard split default is “pedal mapped to lower manual” on first 25 keys (console organ pedal range, two octaves). Default split modes may be changed by menu:

- **Split Keyb** – switches split mode on or off.
- **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
 - 'LowerToU +1', map lower to upper manual up to split point, transpose lower +1 octave
 - 'LowerToU +2' map lower to upper manual up to split point, transpose lower +2 octave

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 (useful for playing pedal bass lines on dual manual keyboards without bass pedals).
- Lower to Upper: Press a **single key** on upper manual while switching SPLIT on to map lower to upper manual up to this key (useful for playing 16' bass lines or 4' accompaniment chords on single manual keyboards).
- 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 to Upper +1: 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 to Upper +2: 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).

Updates/Scripts

Update files, scripts, and documentation are made available on keyboardpartner.com under **Support & Download**.

- **SD File Exec** – Selection of an update or setup script from a SD card. For details please see http://wiki.keyboardpartner.de/index.php?title=HX3.5_SD_Card_Usage.

MIDI Control

HX3.5 accepts MIDI key on/off events (default: channel 1 to upper manual, 2 to lower manual, channel 3 to bass pedals) as well as various MIDI CCs with selectable compatibility sets. 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. The second MIDI jack can be jumpered as MIDI out if required. See mainboard installation manual for details. MIDI OUT transmits all MIDI CC controller data according to NI B4 standard, independent of selected MIDI receive CC set.

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 HX3.5 Editor. To recall presets via MIDI use bank select LSB (CC #32, changeable via menu). To recall voices use 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.

HX3.5 supports MIDI over USB through its USB port connected to a USB host, typically a PC. The USB connection is also suitable for controlling HX3.5 by the HX35 Panel app, firmware updates via MIDI SysEx, and DSP updates via DFU data transfer.

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.

Using HX3 with 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.

Using HX3 with 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 has support for foot controllers and foot switches. The Keywerk/Böhm db4 is also compatible with NI B4 CC set.

Upper, lower and bass drawbars work as usual. It is a good idea to set all to zero before switching on as this is a “known state” for HX3. Also the Percussion and Vibrato buttons work as described in d3c manual.

There is a small drawback, anyway: Default HX3 Vibrato setting is V1 (but upper/lower vibrato OFF), while the V1 LED will not light when powering up the d3c (there is no “V0” on a real Hammond!). So pressing the V1 button will not change the sound – just it’s LED turns on.

The “Brightness” knob controls AO28 “tone” parameter in HX3. There is no key click emulation in HX3 (it is just there!), so you may not adjust key click (a real Hammond does not have key click adjustment, either). The “Key Click” knob controls the bass sustain instead. 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 15 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. It will be saved temporarily (until HX3 switched off) when switching to a preset sound (2 to 12). If you return to preset 1 “Live”, your last drawbar/button setting will be recalled.

Using HX3 with 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**
- XK Tube On button controls HX3 Reverb

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 live settings will be recalled. In addition to that, the HX3.5 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.

HX3 WiFi interface

To operate the HX3 Mainboard with WiFi interface, please refer to the separate [HX3.5 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 HX3.5 Manager at any time.

Please contact KeyboardPartner to obtain a valid licence key. We need your serial number (issued on startup and by HX3.5 Manager application) to generate new licences for you.

Documents library, Download repository:

<https://updates.keyboardpartner.de/>

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

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